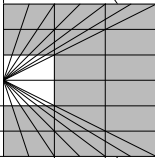


COLLEGE OF THE REDWOODS – STADIUM UPGRADE

tBP Project No. 22079.00
DSA Appl. #01-121308
FILE # 12-C1

Redwoods Community College District
Eureka, California



PROJECT MANUAL

December 6th, 2023

Owner: Redwoods Community College District
College of the Redwoods
7351 Tompkins Hill Rd. Eureka, CA 95501



Architect:
tBP/Architecture
1777 Oakland Blvd, Suite 320
Walnut Creek, CA 94596
925-246-6419

tBP

Architecture
Planning
Interiors
Management



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DIVISION 00
PROCUREMENT AND CONTRACTING
REQUIREMENTS

CONTRACT DOCUMENTS

FOR

Community Stadium Upgrade Project

AT

College of the Redwoods
7351 Tompkins Hill Rd., Eureka, California 95501

REDWOODS COMMUNITY COLLEGE DISTRICT

Consists of:

VOLUME 1

DSA File #xx-xx
DSA Appl. #01-121308

Architect:

tBP/ Architecture
1777 Oakland Blvd, Ste 320
Walnut Creek, CA 94596
(925) 246-6419

December 6, 2023

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SECTION 00 01 02 – CERTIFICATIONS PAGE



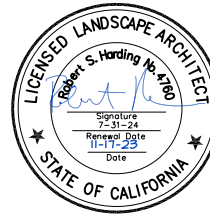
ARCHITECT
tBP/ ARCHITECTURE
1777 Oakland Blvd, Suite 320
Walnut Creek, CA 94596



CIVIL
GHD ENGINEERING
718 Third Street
Eureka, CA 95501



ELECTRICAL
GHD ENGINEERING
2235 Mercury Way
Santa Rosa, CA 95501

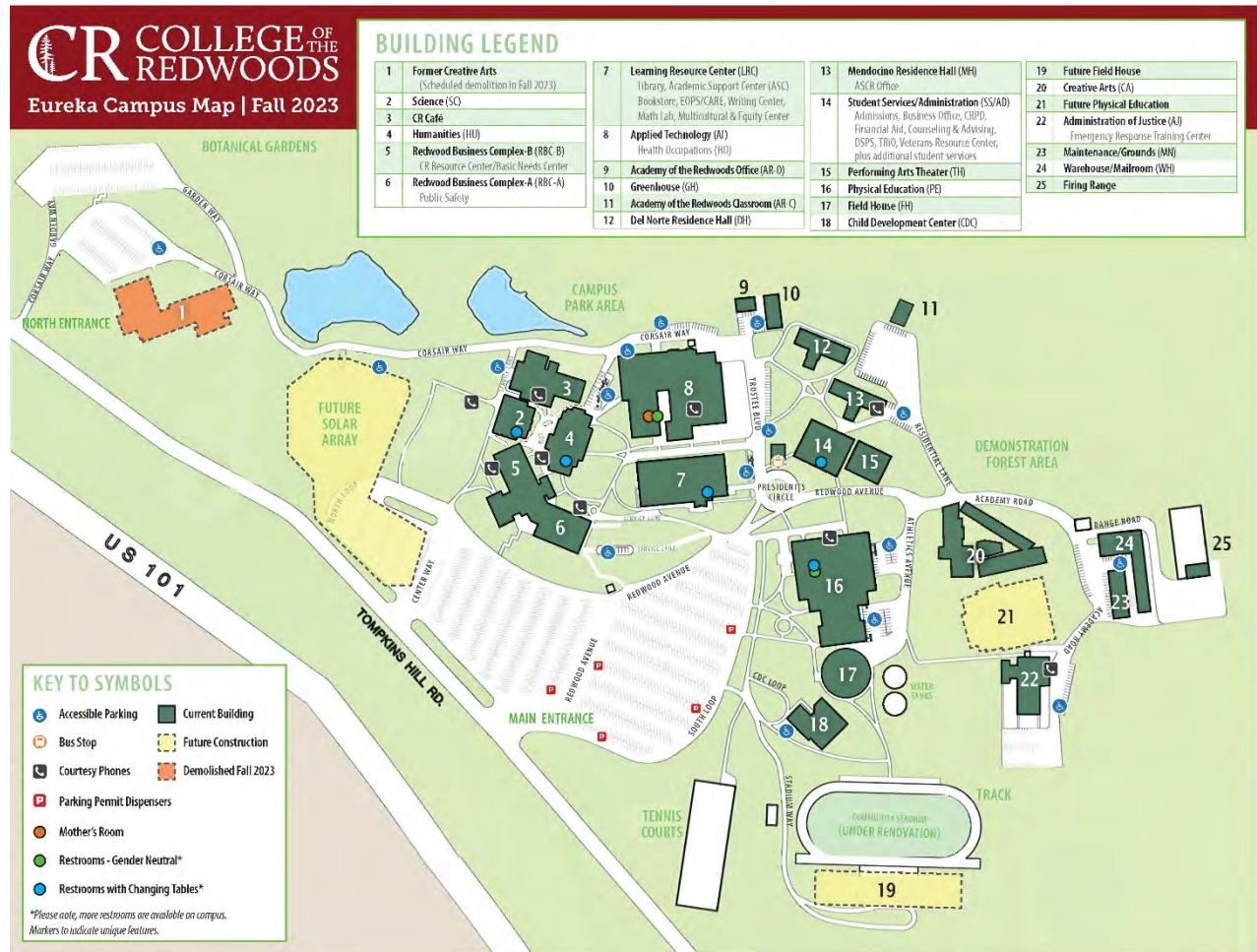


TRACK AND FIELD
D.A. HOGAN & ASSOCIATES, INC.
1450 114TH Ave. SE – Suite 225
Bellevue, WA 9804

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SECTION 00 01 06

COLLEGE OF THE REDWOODS CAMPUS MAP



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DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS, 2022 CBC

Application Number: 01-121308	School Name: College of the Redwoods	School District: Redwoods Community College District
DSA File Number: 12 - C1	Increment Number:	Date Created: 2023-11-17 08:12:00

2022 CBC

IMPORTANT: This form is only a summary list of structural tests and some of the special inspections required for the project. Generally, the structural tests and special inspections noted on this form are those that will be performed by the Geotechnical Engineer of Record, Laboratory of Record, or Special Inspector. The actual complete test and inspection program must be performed as detailed on the DSA approved documents. The appendix at the bottom of this form identifies work NOT subject to DSA requirements for special inspection or structural testing. The project inspector is responsible for providing inspection of all facets of construction, including but not limited to, special inspections not listed on this form such as structural wood framing, high-load wood diaphragms, cold-formed steel framing, anchorage of non-structural components, etc., per Title 24, Part 2, Chapter 17A (2022 CBC).

****NOTE:** Undefined section and table references found in this document are from the CBC, or California Building Code.

KEY TO COLUMNS

1. TYPE	2. PERFORMED BY
<p>Continuous – Indicates that a continuous special inspection is required</p> <p>Periodic – Indicates that a periodic special inspection is required</p> <p>Test – Indicates that a test is required</p>	<p>GE (Geotechnical Engineer) – Indicates that the special inspection shall be performed by a registered geotechnical engineer or his or her authorized representative.</p> <p>LOR (Laboratory of Record) – Indicates that the test or special inspection shall be performed by a testing laboratory accepted in the DSA Laboratory Evaluation and Acceptance (LEA) Program. See CAC Section 4-335.</p> <p>PI (Project Inspector) – Indicates that the special inspection may be performed by a project inspector when specifically approved by DSA.</p> <p>SI (Special Inspection) – Indicates that the special inspection shall be performed by an appropriately qualified/approved special inspector.</p>

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (SOILS), 2022 CBC

Table 1705A.6, Table 1705A.7, Table 1705A.8

Application Number: 01-121308	School Name: College of the Redwoods	School District: Redwoods Community College District
DSA File Number: 12 - C1	Increment Number:	Date Created: 2023-11-17 08:12:00

Geotechnical Reports: Project does NOT have and does NOT require a geotechnical report

S1. GENERAL:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Verify that: <ul style="list-style-type: none"> • Site has been prepared properly prior to placement of controlled fill and/or excavations for foundations. • Foundation excavations are extended to proper depth and have reached proper material. • Materials below footings are adequate to achieve the design bearing capacity. 	See Notes	PI	Refer to specific items identified in the Appendix listing exemptions for limitations. Placement of controlled fill exceeding 12" depth under foundations is not permitted without a geotechnical report.

S2. SOIL COMPACTION AND FILL:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Verify use of proper materials, densities and inspect lift thicknesses, placement and compaction during placement of fill.	Continuous	LOR*	* Under the supervision of a geotechnical engineer or LOR's engineering manager. Refer to specific items identified in the Appendix listing exemptions for limitations.
<input type="checkbox"/>	b. Compaction testing.	Test	LOR*	* Under the supervision of a geotechnical engineer or LOR's engineering manager. Refer to specific items identified in the Appendix listing exemptions for limitations.

S3. DRIVEN DEEP FOUNDATIONS (PILES):				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Verify pile materials, sizes and lengths comply with the requirements.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.
<input type="checkbox"/>	b. Determine capacities of test piles and conduct additional load tests as required.	Test	LOR*	* Under the supervision of the geotechnical engineer.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (SOILS), 2022 CBC

Table 1705A.6, Table 1705A.7, Table 1705A.8

Application Number: 01-121308	School Name: College of the Redwoods	School District: Redwoods Community College District
DSA File Number: 12 - C1	Increment Number:	Date Created: 2023-11-17 08:12:00

	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	c. Inspect driving operations and maintain complete and accurate records for each pile.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.
<input type="checkbox"/>	d. Verify locations of piles and their plumbness, confirm type and size of hammer, record number of blows per foot of penetration, determine required penetrations to achieve design capacity, record tip and butt elevations and record any pile damage.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.
<input type="checkbox"/>	e. Steel piles.	Provide tests and inspections per STEEL section below.		
<input type="checkbox"/>	f. Concrete piles and concrete filled piles.	Provide tests and inspections per CONCRETE section below.		
<input type="checkbox"/>	g. For specialty piles, perform additional inspections as determined by the registered design professional in responsible charge.	*	*	* As defined on drawings or specifications.

S4. CAST-IN-PLACE DEEP FOUNDATIONS (PIERS):				
	Test or Special Inspection	Type	Performed By	Code References and Note
<input type="checkbox"/>	a. Inspect drilling operations and maintain complete and accurate records for each pier.	Continuous	PI	Continuous inspection to be provided by project inspector. Refer to specific items identified in the Appendix listing exemptions for limitations.
<input type="checkbox"/>	b. Verify pier locations, diameters, plumbness and lengths. Record concrete or grout volumes.	Continuous	PI	Continuous inspection to be provided by project inspector. Refer to specific items identified in the Appendix listing exemptions for limitations.
<input type="checkbox"/>	c. Concrete piers.	Provide tests and inspections per CONCRETE section below.		

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (SOILS), 2022 CBC

Table 1705A.6, Table 1705A.7, Table 1705A.8

Application Number: 01-121308	School Name: College of the Redwoods	School District: Redwoods Community College District
DSA File Number: 12 - C1	Increment Number:	Date Created: 2023-11-17 08:12:00

	Test or Special Inspection	Type	Performed By	Code References and Notes
S5. RETAINING WALLS:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Placement, compaction and inspection of backfill.	Continuous	GE*	1705A.6.1. * By geotechnical engineer or his or her qualified representative. (See section S2 above).
<input type="checkbox"/>	b. Placement of soil reinforcement and/or drainage devices.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.
<input type="checkbox"/>	c. Segmental retaining walls; inspect placement of units, dowels, connectors, etc.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative. See DSA IR 18-2.
<input type="checkbox"/>	d. Concrete retaining walls.	Provide tests and inspections per CONCRETE section below.		
<input type="checkbox"/>	e. Masonry retaining walls.	Provide tests and inspections per MASONRY section below.		

S6. OTHER SOILS:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Soil Improvements	Test	GE*	Submit a comprehensive report documenting final soil improvements constructed, construction observation and the results of the confirmation testing and analysis to CGS (California Geological Survey) for final acceptance. * By geotechnical engineer or his or her qualified representative.
<input type="checkbox"/>	b. Inspection of Soil Improvements	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.
<input type="checkbox"/>	c.			

Appendix: Work Exempt from DSA Requirements for Structural Tests / Special Inspections

Application Number: 01-121308	School Name: College of the Redwoods	School District: Redwoods Community College District
DSA File Number: 12 - C1	Increment Number:	Date Created: 2023-11-17 08:12:00

Exempt items given in DSA IR A-22 or the 2019 CBC (including DSA amendments) and those items identified below with a check mark by the design professional are NOT subject to DSA requirements for the structural tests / special inspections noted. **Items marked as exempt shall be identified on the approved construction documents.** The project inspector shall verify all construction complies with the approved construction documents.

	SOILS:
<input type="checkbox"/>	1. Deep foundations acting as a cantilever footing with a design based on minimum allowable pressures per CBC Table 1806A.2 and without a geotechnical report for the following cases: A) free standing sign or scoreboard, B) cell or antenna towers and poles less than 35'-0" tall (e.g., lighting poles, flag poles, poles supporting open mesh fences, etc.), C) single-story structure with dead load less than 5 psf (e.g., open fabric shade structure), or D) covered walkway structure with an apex height less than 10'-0" above adjacent grade.
<input type="checkbox"/>	2. Shallow foundations, etc. are exempt from special inspections and testing by a Geotechnical Engineer for the following cases: A) buildings without a geotechnical report and meeting the exception item #1 criteria in CBC Section 1803A.2 supported by native soil (any excavation depth) or fill soil (not exceeding 12" depth per CBC Section 1804A.6), B) soil scarification/recompaction not exceeding 12" depth, C) native or fill soil supporting exterior non-structural flatwork (e.g., sidewalks, site concrete ramps, site stairs, parking lots, driveways, etc.), D) unpaved landscaping and playground areas, or E) utility trench backfill.

	CONCRETE/MASONRY:
<input type="checkbox"/>	1. Post-installed anchors for the following: A) exempt non-structural components (e.g., mechanical, electrical, plumbing equipment - see item 7 for "Welding" in the Appendix below) given in CBC Section 1617A.1.18 (which replaces ASCE 7-16, Section 13.1.4) or B) interior nonstructural wall partitions meeting criteria listed in exempt item 3 for "Welding" in the Appendix below
<input type="checkbox"/>	2. Concrete batch plant inspection is not required for items given in CBC Section 1705A.3.3.2 subject to the requirements and limitations in that section.
<input type="checkbox"/>	3. Non-bearing non-shear masonry walls may be exempt from certain DSA masonry testing and special inspection items as allowed per DSA IR 21-1. Refer to construction documents for specific exemptions accordingly for each applicable wall condition.
<input type="checkbox"/>	4. Epoxy shear dowels in site flatwork and/or other non-structural concrete.

Appendix: Work Exempt from DSA Requirements for Structural Tests / Special Inspections

Application Number: 01-121308	School Name: College of the Redwoods	School District: Redwoods Community College District
DSA File Number: 12 - C1	Increment Number:	Date Created: 2023-11-17 08:12:00

CONCRETE/MASONRY:	
<input type="checkbox"/>	5. Testing of reinforcing bars is not required for items given in CBC Section 1910A.2 subject to the requirements and limitations in that section.

WELDING:	
<input type="checkbox"/>	1. Solid-clad and open-mesh fences, gates with maximum leaf span of 10', and gates with a maximum rolling section of 10' all having an apex height less than 8'-0" above lowest adjacent grade. When located above circulation or occupied space below, these gates/fences are not located within 1.5x gate/fence height (max 8'-0") to the edge of floor or roof.
<input type="checkbox"/>	2. Handrails, guardrails, and modular or relocatable ramps associated with walking surfaces less than 30" above adjacent grade (excluding post base connections per the 'Exception' language in Section 1705A.2.1); fillet welds shall not be ground flush.
<input type="checkbox"/>	3. Non-structural interior cold-formed steel framing spanning less than 15'-0", such as in interior partitions, interior soffits, etc. supporting only self weight and light-weight finishes or adhered tile, masonry, stone, or terra cotta veneer no more than 5/8" thickness and apex less than 20'-0" in height and not over an exit way. Maximum tributary load to a member shall not exceed the equivalent of that occurring from a 10'x10' opening in a 15' tall wall for a header or king stud.
<input type="checkbox"/>	4. Manufactured support frames and curbs using hot rolled or cold-formed steel (i.e., light gauge) for mechanical, electrical, or plumbing equipment weighing less than 2000# (equipment only) (connections of such frames to superstructure elements using welding will require special inspection as noted in selected item(s) for Sections S/A3, S/A4 and/or S/A5 of listing above).
<input type="checkbox"/>	5. Manufactured components (e.g., Tolco, B-Line, Afcon, etc.) for mechanical, electrical, or plumbing hanger support and bracing (connections of such components to superstructure elements using welding will require special inspection as noted in selected item(s) for Sections S/A3, S/A4 and/or S/A5 of listing above).
<input type="checkbox"/>	6. TV Brackets, projector mounts with a valid listing (see DSA IR A-5) and recreational equipment (e.g., playground structures, basketball backstops, etc.) (connections of such elements to superstructure elements using welding will require special inspection as noted in selected item(s) for sections S/A3, S/A4 and/or S/A5 located in the Steel/Aluminum category of listing above).
<input type="checkbox"/>	7. Any support for exempt non-structural components given in CBC Section 1617A.1.18 (which replaces ASCE 7-16, Section 13.1.4) meeting the following: A) when supported on a floor/roof, <400# and resulting composite center of mass (including component's center of mass) ≤4' above supporting floor/roof, B) when hung from a wall or roof/floor, <20# for discrete units or <5 plf for distributed systems.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS(SIGNATURE), 2022 CBC

Application Number:

01-121308

School Name:

College of the Redwoods

School District:

Redwoods Community College District

DSA File Number:

12 - C1

Increment Number:

Date Created:

2023-11-17 08:12:00

Name of Architect or Engineer in general responsible charge:

TBP/ Architecture, Philip Newsom/ President

Name of Structural Engineer (When structural design has been delegated):

Signature of Architect or Structural Engineer:



Date:

11.21.23

Note: To facilitate DSA electronic mark-ups and identification stamp application, DSA recommends against using secured electronic or digital signatures.

DSA STAMP

DSA 103-22: LIST OF REQUIRED VERIFIED REPORTS, CBC 2022

Application Number:

01-121308

DSA File Number:

12 - C1

School Name:

College of the Redwoods

Increment Number:

School District:

Redwoods Community College District

Date Created:

2023-11-17 08:12:00

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CONSULTANTS ACRONYMS

District: College of the Redwoods	CoR
Architecture: tBP Architecture	tBP
Field and Track: D.A. Hogan & Associates	DH
Civil: GHD Engineering	GHD

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**Section 00 11 16
NOTICE INVITING BIDS**

Community Stadium Upgrade Project

College of the Redwoods
7351 Tompkins Hill Road
Eureka, California 95501

1. Notice is hereby given that the Governing Board of the Redwoods Community College District (“District”), of the County of Humboldt, State of California, will receive sealed bids for the Community Stadium Upgrade Project (“Project”) up to, but not later than, 11:00 a.m., on January 25th, 2024, and will thereafter publicly open and read aloud the bids. All bids shall be received in the Board Room SS 202A, on the Second Floor of the Student Services/Administration Building on the Eureka College of the Redwoods Campus, 7351 Tompkins Hill Rd, Eureka, California 95501. The Scope of Work and Supporting Documents are available for examination on the College of the Redwoods Purchasing webpage ***beginning on December 21, 2023:*** <https://www.redwoods.edu/businessoffice/Purchasing>.

Construction Cost Estimate: **\$5,500,000 - \$7, 252,000**

California License Required: A or B

In general, the Work consists of, but is not limited to, demolition of an existing Track, Field and equipment shed, and the construction of new track, artificial turf field, ADA access paths of travel, viewing platforms, utilities, storm drain, landscape, irrigation & other site development.

The District does not provide hardcopies of bid documents or reimburse cost of printing, delivery, or any expenses related to the bidding process.

For information directly from the District, you may also log on to the District Website: <https://www.redwoods.edu/businessoffice/Purchasing> Project documents available include, but are not limited to, plans, specifications, addenda, bidders lists, bid results, etc., and can be viewed on this District webpage.

All questions related to this project must be submitted, via email, to:

Leslie Marshall, Director – Facilities & Planning

Redwoods Community College District
7351 Tompkins Hill Rd., Eureka, CA 95501

Email: Leslie-Marshall@redwoods.edu

2. Each bid shall be completed on the Bid Proposal Form included in the Contract Documents, and must conform and be fully responsive to this invitation, the plans and

specifications and all other Contract Documents. Copies of the Contract Documents are available for examination on the College of the Redwoods Purchasing webpage **beginning on December 21, 2023:**

<https://www.redwoods.edu/businessoffice/Purchasing>.

3. Each bid shall be accompanied by cash, a cashier's or certified check, or a bidder's bond executed by a surety licensed to do business in the State of California as a surety, made payable to the District, in an amount not less than ten percent (10%) of the maximum amount of the bid (made payable to the Redwoods Community College District). The check or bid bond shall be given as a guarantee that the bidder to whom the contract is awarded will execute the Contract Documents and will provide the required payment and performance bonds and insurance certificates within ten (10) days after the notification of the award of the contract. The District reserves the right to forfeit Bid Bond submitted for failure of the successful bidder to secure Payment & Performance Bonds.

The successful bidder will be required to furnish a labor and material bond in an amount equal to one hundred percent (100%) of the contract price and a faithful performance bond in an amount equal to one hundred percent (100%) of the contract price **within ten (10) calendar days from the date of issuance of the Notice to Proceed**, said bonds to be secured from a surety company acceptable to the Redwoods Community College District and authorized to execute such surety in the State of California.

4. The successful bidder shall comply with the provisions of the Labor Code pertaining to payment of the generally prevailing rate of wages and apprenticeships or other training programs. The Department of Industrial Relations has made available the general prevailing rate of per diem wages in the locality in which the work is to be performed for each craft, classification or type of worker needed to execute the contract, including employer payments for health and welfare, pension, vacation, apprenticeship and similar purposes. Copies of these prevailing rates are available to any interested party upon request and are online at <http://www.dir.ca.gov/DLSR>. The Contractor and all Subcontractors shall pay not less than the specified rates to all workers employed by them in the execution of the Contract. It is the Contractor's responsibility to determine any rate change.
5. The schedule of per diem wages is based upon a working day of eight hours. The rate for holiday and overtime work shall be at least time and one half.
6. Pursuant to Public Contract Code §4104, each bid shall include the name and location of the place of business of each subcontractor who shall perform work or service or fabricate or install work for the contractor in excess of one-half of one percent (1/2 of 1%) of the bid price. The bid shall describe the type of the work to be performed by each listed subcontractor.

7. No bid may be withdrawn for a period of sixty (60) days after the date set for the opening for bids except as provided by Public Contract Code §§5100 *et seq.* The District reserves the right to reject any and all bids and to waive any informalities or irregularities in the bidding.
8. **Minority, women, and disabled veteran contractors are encouraged to submit bids. This bid is subject to Disabled Veteran Business Enterprise requirements.**
9. The project is subject to compliance monitoring and enforcement by the California Department of Industrial Relations. In accordance with SB 854 (**California Labor Code sections 1725.5 and 1770 *et seq.***), all bidders, contractors and subcontractors working at the site shall be duly registered with the Department of Industrial Relations at time of bid opening and at all relevant times. Proof of registration shall be provided as to all such contractors prior to the commencement of any work.
10. Each bidder shall possess at the time the bid is awarded the following classification(s) of California State Contractor's license: A or B
11. **By approving these bid documents, if the Project is over \$5,000, retention will be 5% of the project cost. If the Governing Board finds that the Project is substantially complex and unique, it will therefore require a retention amount of up to 10% for the following reasons:**

12. X Bidders' Conference. A mandatory bidders' conference will be held at the **Theater, College of the Redwoods, 7351 Tompkins Hill Rd, Eureka, CA 95501 on Thursday, January 11th 2024 at 11:00 AM, with a site walk following at the Community Stadium** for the purpose of acquainting all prospective bidders with the Contract Documents and the Project site. **Failure to attend the conference may result in the disqualification of the bid of the non-attending bidder.**

_____ No Bidders' Conference.

REDWOODS COMMUNITY COLLEGE DISTRICT

By: Keith Flamer

DATED: December 1, 2023

Publication Dates: 1) December 7, 2023__ 2) December 11, 2023

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Section 00 21 13
INSTRUCTIONS TO BIDDERS

Each bid submitted to the Redwoods Community College District (“District”) for the Community Stadium Upgrade Project (“Project”) shall be in accordance with the following instructions and requirements, which are part of the Contract Documents for this Project.

1. Issuing Of Documents
 - a. Bidding Documents may be examined at the Redwoods Community College District, 7351 Tompkins Hill Rd., Eureka CA, 95501. By Appointment: Leslie Marshall, Director-Facilities & Planning, phone: (707) 476-4382.
2. Qualifications Of Bidders
 - a. Bidders may be required to furnish additional evidence satisfactory to the District that they have sufficient means and sufficient experience in the class of work called for to enable them to complete the Contract in a satisfactory manner. The District has pre-qualified General Contractors for this project, and the list of pre-qualified General Contractors can be found on the District’s web site: <https://www.redwoods.edu/businessoffice/Purchasing>
 - b. Bidders shall be Contractors properly licensed in accordance with the laws of the State of California.
 - c. The successful Bidder shall furnish satisfactory Certificates of Insurance coverage as specified in the Contract Documents.
3. **Bidders’ Conference.** A mandatory bidders’ conference will be held at the **Theater, College of the Redwoods, 7351 Tompkins Hill Rd, Eureka, CA 95501 on Thursday, January 11th 2024 at 11:00 AM, with a site walk following at the Community Stadium**, for the purpose of acquainting all prospective bidders with the Contract Documents and the Project site. It is imperative that all prospective bidders attend this conference. The failure to attend the conference will result in the disqualification of the bid of the non-attending bidder.
4. **Requests for Information.** A bidder’s failure to request clarification or interpretation of an apparent error, inconsistency or ambiguity in the Contract Documents waives that bidder’s right to thereafter claim entitlement to additional compensation based upon an ambiguity, inconsistency, or error, which should have been discovered by a reasonably prudent Contractor, subject to the limitations of Public Contract Code §1104. Any questions relative to the bid shall be in writing and directed to the District Superintendent or designee at the address specified for receipt of bid proposals. These requests shall be submitted to the District at least five working days prior to the date the bid is due.
5. **Deadline For Receipt of Bids.** Each bid shall be sealed and submitted to the District Superintendent or designee no later than, 11:00 AM., on Thursday, January 25th, 2024. The District suggests that bids be hand delivered in order to ensure their timely receipt. Any bids received after the time stated, regardless of the reason, shall be returned, unopened, to the bidder.

6. Receipt And Opening Of Bids
 - a. Redwoods Community College District hereinafter referred to as the District, will receive Bids at the same time and place specified in the Invitation to Bid.
 - b. Complete the Bid Form included in the Project Manual.
 - c. The envelopes containing the Bids shall be sealed, addressed to the District, and designated as “Community Stadium Upgrade Project, College of the Redwoods”. The envelope shall contain the name and address of the Bidder.
 - d. Bids that are mailed shall have the previously-described envelope placed inside an envelope addressed to: REDWOODS COMMUNITY COLLEGE DISTRICT, 7351 Tompkins Hill Rd., Eureka CA, 95501 ATTENTION: Leslie Marshall, Director-Facilities & Planning. Bids should be mailed in time to be received prior to the time set forth in the Invitation to Bid.
 - e. Bids which are conditional (or which make alterations, omissions, or reservations to the terms of the Bidding Documents) may be rejected as non-responsive.
 - f. All monetary figures are required, both in writing and in numerals. In event of conflict between written quotations and numerical quotations, written quotations shall govern.
 - g. Type or print all bid data legibly in ink except signatures which shall be in script. Mistakes may be crossed out and corrections inserted, if each is initialed in ink by signer of Bid.
 - h. Bidder's business address and signature shall be on the Bid. A Bid by a partnership shall furnish the full names of partners and be signed in the partnership name by one member of the partnership, or by authorized representative, followed by the signature and designation of the person signing. Bids by corporations, with corporate seal affixed, shall be signed with the legal name of the corporation followed by the name of the state of incorporation and by the signature and designation of the person authorized to bind it to the matter. The name of each person signing shall also be typed or printed below the respective signatures. When required by the District, satisfactory evidence of authority of the office signing in behalf of the corporation shall be furnished.
 - i. No Bids will be received after the date and time set forth in the Notice Inviting Bids.

7. Bid Proposal Forms. All bid proposals shall be made on the form provided by the District. All items on the form shall be filled out in ink. Numbers should be stated in figures, and the signatures of all individuals must be in long hand. The completed form should be without interlineations, alterations, or erasures

8. Execution of Forms. Each bid shall give the full business address of the bidder and must be signed by the bidder or bidder’s authorized representative with his or her usual signature. Bids by partnerships must furnish the full names of all partners and must be signed in the partnership name by a general partner with authority to bind the partnership in such matters. Bids by corporations must be signed with the legal name of the corporation, followed by the signature and designation of the president, secretary, or other person authorized to bind the corporation in this matter. The name of each person signing shall also be typed or printed below the signature. When requested by the District, satisfactory evidence of the authority of the officer signing on behalf of the corporation or partnership shall be furnished. A bidder's failure to properly sign required forms may result in rejection of the bid. All bids must include the bidder's contractor license number(s) and expiration date(s).

9. Bid Security. Bid proposals shall be accompanied by a certified or cashier's check or bid bond for an amount not less than ten percent (10%) of the bid amount, payable to the District. A bid bond shall be secured from an admitted surety company, licensed in the State of California, and satisfactory to the District. The bid security shall be given as a guarantee that the bidder will enter into the Contract if awarded the work, and in the case of refusal or failure to enter into the Contract within ten (10) calendar days after notification of the award of the Contract or failure to provide the payment and performance bonds and proof of insurance as required by the Contract Documents, the District shall have the right to award the Contract to another bidder and declare the bid security forfeited. The District reserves the right to pursue all other remedies in law or equity relating to such a breach including, but not limited to, seeking recovery of damages for breach of contract. Failure to provide bid security, or bid security in the proper amount, shall result in rejection of the bid.

10. Withdrawal of Bid Proposals. Bid proposals may be withdrawn by the bidders prior to the time fixed for the opening of bids, but may not be withdrawn for a period of sixty (60) days after the opening of bids, except as permitted pursuant to Public Contract Code §5103.

11. Addenda or Bulletins. The District reserves the right to issue addenda or bulletins prior to the opening of the bids subject to the limitations of Public Contract Code §4104.5. Any addenda or bulletins issued prior to bid time shall be considered a part of the Contract Documents.

12. Bonds. The successful bidder shall be required to submit payment and performance bonds as specified in and using the bond forms included with the Contract Documents. All required bonds shall be based on the maximum total contract price as awarded, including additive alternates, if applicable.

13. Rejection of Bids and Award of Contract. The District reserves the right to waive any irregularities in the bid and reserves the right to reject any and all bids. The Contract will be awarded, if at all, within sixty (60) calendar days after the opening of bids to the lowest responsible and responsive bidder, subject to Governing Board approval. The time for awarding the Contract may be extended by the District with the consent of the lowest responsible, responsive bidder.

14. Bid Protests
 - a. Inquiries or questions based on alleged patent ambiguity of the plans, specifications or estimate must be communicated as a bidder inquiry prior to bid opening. Any such inquiries or questions, submitted after bid opening, will not be treated as a bid protest.
 - b. Bidder may file a protest with the District against the Bid of other Bidder or Bidders ("Bid Protest") subject to the provisions of this Article. The procedures and time limits set forth in this Article are mandatory and are a Bidder's sole and exclusive remedy in protesting other Bidders' bids. Failure to comply with these procedures shall constitute a waiver of any right to pursue a Bid Protest, or to contest the District's award of the contract for the

work that is the subject of the Bid, in any legal proceeding before any authority with jurisdiction.

- c. Bid Protests and Responses shall be governed by the following time limitations:
 - i. Bidder must deliver any Bid Protest to the District, in writing, before 2:00PM, five (5) working days after the date of bid opening. The District will reject any Bid Protest not received by the District by this deadline. Bidder must concurrently deliver a copy of its Bid Protest to all Bidders against whose Bids the Bid Protest is directed. The Bidder must
15. Execution of Contract. The successful bidder shall, within ten (10) calendar days of the Notice of Award of the Contract, sign and deliver to the District the executed contract along with the bonds and certificates of insurance required by the Contract Documents. In the event the successful bidder fails or refuses to execute the Contract or fails to provide the bonds and certificates as required, the District may declare the bidder's bid deposit or bond forfeited as liquidated damages, and may award the work to the next lowest responsible, responsive bidder, or may reject all bids and, in its sole discretion, call for new bids. In all cases, the District reserves the right, without any liability, to cancel the award of Contract at any time prior to the full execution of the Contract.
 16. Drawings and Specifications. All drawings, specifications and other documents used or prepared during the project shall be the exclusive property of the District.
 17. Evidence of Responsibility. Upon the request of the District, a bidder shall submit promptly to the District satisfactory evidence showing the bidder's financial resources, the bidder's experience in the type of work being required by the District, the bidder's availability to perform the Contract and any other required evidence of the bidder's qualifications and responsibility to perform the Contract. The District may consider such evidence before making its decision to award the Contract. Failure to submit requested evidence may result in rejection of the bid.
 18. Taxes. Applicable taxes shall be included in the bid prices.
 19. Bid Exceptions. Bid exceptions are not allowed. If the Bidder has a comment regarding the bid documents or the scope of work, the Bidder shall submit those comments to the District for evaluation at least five working days prior to the opening of the bids. No oral or telephonic modification of any bid submitted will be considered and a sealed written modification may be considered only if received prior to the opening of bids. E-mailed or faxed bids or modifications will not be accepted.
 20. Discounts. Any discounts which the bidder desires to provide the District must be stated clearly on the bid form itself so that the District can calculate the net cost of the bid proposal. Offers of discounts or additional services not delineated on the bid form will not be considered by the District in the determination of the lowest responsible responsive bidder.

21. Quantities. The quantities shown on the plans and specifications are approximate. The District reserves the right to increase or decrease quantities as desired.
22. Prices. Bidders must quote prices F.O.B. unless otherwise noted. Prices should be stated in the units specified and bidders should quote each item separately.
23. Samples. On request, samples of the products being bid shall be furnished to the District.
24. Special Brand Names/Substitutions. In describing any item, the use of a manufacturer or special brand does not restrict bidding to that manufacturer or special brand, but is intended only to indicate quality and type of item desired, except as provided in §3400 of the Public Contract Code. Substitute products will be considered either prior to or after the award of the Contract in accordance with §3400 and as set forth in either the Supplemental Conditions or the Specifications. All data substantiating the proposed substitute as an "equal" item shall be submitted with the written request for substitution. The District reserves the right to make all final decisions on product and vendor selection.
25. Container Costs and Delivery. All costs for containers shall be borne by the bidder. All products shall conform to the provisions set forth in the federal, county, state and city laws for their production, handling, processing and labeling. Packages shall be so constructed to ensure safe transportation to the point of delivery.
26. Bid Negotiations. A bid response to any specific item of the bid using terms such as "negotiable," "will negotiate," or similar phrases, will be considered non-responsive.
27. Prevailing Law. In the event of any conflict or ambiguity between these instructions and state or federal law or regulations, the latter shall prevail. All equipment to be supplied or services to be performed under the bid proposal shall conform to all applicable requirements of local, state and federal law, including, but not limited to, Labor Code §§1771, 1778 and 1779.
28. Allowances. An "allowance" means an amount included in the bid proposal for work that may or may not be included in the Project, depending on conditions that will become known only after the Project is underway.
29. Subcontractors. Pursuant to the Subletting and Subcontracting Fair Practices Act, Public Contract Code §§4100-4114, every bidder shall, on the enclosed Subcontractor List Form, set forth:
 - a. The name and location of the place of business of each Subcontractor who will perform work or labor or render service to the bidder in or about the work or fabricate and install work in an amount in excess of one-half (1/2) of the one percent (1%) of the bidder's total bid.
 - b. If the bidder fails to specify a Subcontractor for any portion of the work to be performed under the Contract in excess of one-half (1/2) of one percent (1%) of the bidder's total bid, bidder agrees that bidder is fully qualified to and shall perform that

portion of the work. The successful bidder shall not, without the written consent of the District or compliance with Public Contract Code §§4100 - 4114, either:

- 1) Substitute any person as Subcontractor in place of the Subcontractor designated in the original bid;
- 2) Permit any subcontract to be voluntarily assigned or transferred or allow the work to be performed by anyone other than the original Subcontractor listed in the bid; or
- 3) Sublet or subcontract any portion of the work in excess of one-half (1/2) of one percent (1%) of the total bid as to which the bidder's original bid did not designate a Subcontractor.

30. Examination of Contract Documents and Work Site. Before submitting a bid proposal, all bidders shall carefully examine the Contract Documents, including the plans and specifications, shall visit the site of the proposed work, and shall fully inform themselves of all conditions in and about the work site, as well as applicable federal, state and local laws and regulations that may affect the work. No bidder shall visit the site without prior authorization of the District. Bidders shall contact the District Superintendent or designee for coordination of site visits.

31. Form and Approval of Contract. The Contract Documents must be approved by the Governing Board of the District and its legal counsel. The bidder selected by the District shall execute the contract provided by the District.

32. Licenses and Permits. Each bidder shall at all times possess all appropriate and required licenses or other permits to perform the work as identified in the Contract Documents. Upon request, each bidder shall furnish the District with evidence demonstrating possession of the required licenses or permits.

33. Denial of Right to Bid. Contractors or Subcontractors who have violated state law governing public works shall be denied the right to bid on this public works contract pursuant to Labor Code §1777.7.

34. Bidders Interested in More Than One Bid. No person, firm, or corporation shall make, or file, or be interested in more than one bid. However, a person, firm, or corporation that has submitted a subproposal to a bidder, or that has quoted prices of materials to a bidder, is not thereby disqualified from submitting a sub-proposal or quoting prices to other bidders or from submitting a prime proposal.

35. Contractor's State License Board. Contractors and Subcontractors are required by law to be licensed and regulated by the California Contractors' License Board.

36. 32. Labor Compliance. The project is subject to compliance monitoring and enforcement by the California Department of Industrial Relations. In accordance with SB

854, all bidders, contractors and subcontractors working at the site shall be duly registered with the Department of Industrial Relations at time of bid opening and at all relevant times. Proof of registration shall be provided as to all such contractors prior to the commencement of any work.

37. **Iran Contracting Act Certification/Compliance with Economic Sanctions Certification.** Contractors shall submit the Iran Contracting Act Certification and the Compliance with Economic Sanctions Certification with their Bid. Bids submitted without these certifications shall be deemed non-responsive and will not be considered.

38. 34. Additive and Deductive Items: Method of Determining Lowest Bid. Pursuant to Public Contract Code §20103.8, if the bid solicitation includes additive and/or deductive items, the checked [X] method shall be used to determine the lowest bid: *[check one]*

_____ (a) The lowest bid shall be the lowest bid price on the base contract without consideration of the prices on the additive or deductive items.

X (b) The lowest bid shall be the lowest total of the bid prices on the base contract and those additive or deductive items that were specifically identified in the bid solicitation or Bid Proposal Form as being used for the purpose of determining the lowest bid price. Alternates may not be selected in order.

_____ (c) The lowest bid shall be the lowest total of the bid prices on the base contract and those additive or deductive items taken in order from a specifically identified list of those items that, when in the solicitation, and added to, or subtracted from, the base contract, are less than, or equal to, a funding amount publicly disclosed by the District before the first bid is opened.

_____ (d) The lowest bid shall be determined in a manner that prevents any information that would identify any of the bidders or the proposed Subcontractors or suppliers from being revealed to the public entity before the ranking of all bidders from lowest to highest has been determined.

If no method is checked, sub-paragraph (a) shall be used to determine the lowest bid.

Notwithstanding, the method used by the District to determine the lowest responsible bidder, the District retains the right to add to or deduct from the Contract any of the items included in the bid solicitation. Alternates may not be selected in order.

39. Bid Protest. Any bid protest must be in writing and received by the District Office before 5:00 p.m. no later than three (3) working days following bid opening and shall comply with the following requirements:

a. The bid protest must contain a complete statement of the basis for the protest and all supporting documentation.

- b. The party filing the protest must have actually submitted a bid for the Project. A Subcontractor of a bidder submitting a bid for the Project may not submit a bid protest. A bidder may not rely on the bid protest submitted by another bidder, but must timely pursue its own protest.
- c. The protest must refer to the specific portion or portions of the Contract Documents upon which the protest is based.
- d. The protest must include the name, address and telephone number of the person representing the protesting bidder.
- e. The bidder filing the protest must concurrently transmit a copy of the bid protest and all supporting documentation to all other bidders with a direct financial interest which may be affected by the outcome of the protest, including all other bidders who appear to have a reasonable prospect of receiving an award depending upon the outcome of the protest.
- f. The bidder whose bid has been protested may submit a written response to the bid protest. Such response shall be submitted to the District before 5 p.m. no later than two (2) working days after the deadline for submission of the bid protest or receipt of the bid protest, whichever is sooner, and shall include all supporting documentation. Such response shall also be transmitted concurrently to the protesting bidder and to all other bidders who appear to have a reasonable prospect of receiving an award depending upon the outcome of the protest.
- g. The procedure and time limits set forth in this section are mandatory and are the bidder's sole and exclusive remedy in the event of bid protest. The bidder's failure to comply with these procedures shall constitute a waiver of any right to further pursue the bid protest, including filing a Government Code claim or legal proceedings.
- h. If the District determines that a protest is frivolous, the protesting bidder may be determined to be non-responsible and that bidder may be determined to be ineligible for future contract awards by the District.
- i. A "working day" for purposes of this section means a weekday during which the District's office is open and conducting business, regardless of whether or not school is in session.

SECTION 00 30 00
AVAILABLE INFORMATION

REPORT AND INFORMATION

Existence of reports, record drawings, and utility surveys: Redwoods Community College District, its consultants, and prior contractors may have collected documents providing a general description of the site and conditions of the work. These documents may consist of geotechnical reports for and around the site, record drawings, utility drawings, and information regarding underground utilities. These reports, documents and other information are not part of the Contract Documents and do not show new work to be constructed, rather, they show existing conditions that Contractor may have to address as part of its construction planning.

Available Documentation - The following documents are either available for review through District office, or the District's web site:

Existing PE Building Drawings

Creative Arts Project As-Built Drawings

Underground Utility Project Drawings

E.1 College of the Redwoods Building Infrastructure and Site Utilities

E.2 College of the Redwoods Building Infrastructure and Site Utilities - Addendum 1

Geotechnical Reports - LACO

Geotechnical and Geologic Hazard Evaluation Report – New Gymnasium, May 1, 2020

Geotechnical and Geologic Hazard Evaluation Report – New Fieldhouse Building,
December 30, 2020

Addendum Number 2 to Geotechnical and Geologic Hazards Evaluation Report – New
Gymnasium and Fieldhouse Building. November 16, 2021

Addendum to Note 48 Compliant Geotechnical and Geologic Hazard Evaluation Report New
Fieldhouse Building Retaining Walls. December 1, 2022

Hazardous Materials Reports

04/08/2022 GHD Asbestos Assessment Report - Fieldhouse and Physical Education
Buildings

08/01/2023 FACS Lead Survey Report – Fieldhouse and Physical Education Buildings

College of the Redwoods Campus COVID-19 Rules

Contractor shall acknowledge and accept that the documents are not a part of the Contract Documents and are made available to bidders for reference only. The District and its representatives are not

responsible for any and all discrepancies between the documents and the existing and actual as-built conditions, and do not guarantee the accuracy of the documents.

The District and Architect assume no responsibility for the completeness or accuracy of the documents or the records compiled there from and the interpretations made from the documents. There is no express or implied guarantee that the conditions indicated in the documents are representative of those existing throughout the building and/or site. Conditions differing substantially from those indicated may be encountered.

END OF SECTION 00 30 00

**Section 00 41 00
BID PROPOSAL FORM**

Governing Board
Redwoods Community College District

Dear Members of the Governing Board:

The undersigned, doing business under the name of _____, having carefully examined the location of the proposed work, the local conditions of the place where the work is to be done, the Notice Inviting Bids, the General Conditions, the Instructions to Bidders, the Plans and Specifications, and all other Contract Documents for the proposed _____ Project ("Project"), and having accurately completed the Bidder's Questionnaire, proposes to perform all work and activities in accordance with the Contract Documents, including all of its component parts, and to furnish all required labor, materials, equipment, transportation and services required for the construction of the Project in strict conformity with the Contract Documents, including the Plans and Specifications, as follows:

BASE BID:

For the sum of

_____ Dollars (\$ _____).

ADDITIVE/DEDUCTIVE ALTERNATE *[if applicable]*:

Additive/Deductive Alternate #1 _____
Add/Subtract _____ Dollars (\$ _____)

Additive/Deductive Alternate #2 _____
Add/Subtract _____ Dollars (\$ _____)

Additive/Deductive Alternate #3 _____
Add/Subtract _____ Dollars (\$ _____)

Additive/Deductive Alternate #4 _____
Add/Subtract _____ Dollars (\$ _____)

Additive/Deductive Alternate #5 _____
Add/Subtract _____ Dollars (\$ _____)

Additive/Deductive Alternate #6 _____
Add/Subtract _____ Dollars (\$ _____)

Additive/Deductive Alternate #7 _____

Add/Subtract _____ Dollars (\$ _____)

Additive/Deductive Alternate #8 _____
Add/Subtract _____ Dollars (\$ _____)

The undersigned has checked carefully all the above figures and understands that the District is not responsible for any errors or omissions on the part of the undersigned in making this bid.

Enclosed find certified or cashier's check no. _____ of the _____ Bank for _____ Dollars (\$ _____) or Bidder's Bond of the _____ surety company in an amount of not less than ten percent (10%) of the entire bid. The undersigned further agrees, on the acceptance of this proposal, to execute the Contract and provide the required bonds and insurance and that in case of default in executing these documents within the time fixed by the Contract Documents, the proceeds of the check or bond accompanying this bid shall be forfeited and shall become the property of the District.

Contractor agrees to commence the work within the time specified in the Notice to Proceed. It is understood that this bid is based upon completing the work within the number of calendar days specified in the Contract Documents.

ADDENDA:

Receipt of the following addenda is hereby acknowledged:

Addendum # _____ Dated: _____ Addendum # _____ Dated: _____
Addendum # _____ Dated: _____ Addendum # _____ Dated: _____
Addendum # _____ Dated: _____ Addendum # _____ Dated: _____

Respectfully submitted,

Company: _____

Address: _____

By: _____
(Please Print Or Type)

Signature: _____

Title: _____

Date: _____

Telephone: _____

Contractor's License No: _____ Expiration Date _____

Required Attachments:

- Subcontractor List Form
- Non-Collusion Declaration
- Workers Compensation Certificate
- Iran Contracting Act Certification
- Compliance with Economic Sanctions Certification
- Bid Bond (or Cashier's or Certified Check)
- Bidders' Questionnaire

WORKERS' COMPENSATION CERTIFICATE

Labor Code §3700 in relevant part provides:

"Every employer except the State shall secure the payment of compensation in one or more of the following ways:

- (a) By being insured against liability to pay compensation in one or more insurers duly authorized to write compensation insurance in this State.
- (b) By securing from the Director of Industrial Relations a certificate of consent to self-insure, which may be given upon furnishing proof satisfactory to the Director of Industrial Relations of ability to self-insure and to pay any compensation that may become due to his employees."

I am aware of the provisions of §3700 of the Labor Code which require every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that Code, and I will comply with such provisions before commencing the performance of the work of this Contract and will require all Subcontractors to do the same.

Contractor

By: _____

In accordance with Article 5 (commencing at §1860), Chapter 1, Part 7, Division 2 of the Labor Code, the above certificate must be signed and filed with the awarding body prior to performing any work under this Contract.

IRAN CONTRACTING ACT CERTIFICATION

(Public Contract Code Sections 2202-2208)

As required by California Public Contract Code Section 2204, the Contractor certifies subject to penalty for perjury that the option checked below relating to the Contractor's status in regard to the Iran Contracting Act of 2010 (Public Contract Code Section 2200 et seq.) is true and correct:

The Contractor is not:

- identified on the current list of persons and entities engaging in investment activities in Iran prepared by the California Department of General Services in accordance with subdivision (b) of Public Contract Code Section 2203; or
- a financial institution that extends, for 45 days or more, credit in the amount of \$20,000,000 or more to any other person or entity identified on the current list of persons and entities engaging in investment activities in Iran prepared by the California Department of General Services in accordance with subdivision (b) of Public Contract Code Section 2203, if that person or entity uses or will use the credit to provide goods or services in the energy sector in Iran.

The District has exempted the Contractor from the requirements of the Iran Contracting Act of 2010 after making a public finding that, absent the exemption, the District will be unable to obtain the goods and/or services to be provided pursuant to the Contract.

The amount of the Contract payable to the Contractor for the Project does not exceed \$1,000,000.

(or declare) under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

Signature

Date

Name

Title

Name of Contractor

COMPLIANCE WITH ECONOMIC SANCTIONS CERTIFICATION

As required by Executive Order N-6-22, issued by Governor Gavin Newsom on March 4, 2022 (“EO”), the Contractor certifies compliance with the economic sanctions imposed in response to Russia’s actions in Ukraine, including with respect to, but not limited to, the federal executive orders identified in the EO and the sanctions identified on the U.S. Department of the Treasury website (<https://home.treasury.gov/policy-issues/financial-sanctions/sanctions-programs-and-country-information/ukraine-russia-related-sanctions>). Contractor understands that failure to comply may result in the termination of this Agreement.

If this Agreement is valued at \$5 million or more, Contractor understands and agrees that within 45 days of receipt of the Notice to Proceed, it must report in writing to the District on steps it has taken to comply with the EO and with Federal Executive Order 14065, including but not limited to, desisting from making new investments in, or engaging in financial transactions with Russian entities.

Signature _____ Date _____

Name _____ Title _____

Name of Contractor _____

BID BOND

We, the Contractor, _____ as principal ("Principal"), and _____, as surety ("Surety"), are firmly bound unto the Redwoods Community College District ("District") in the penal sum of ten percent (10%) of the total amount of the bid of the Principal submitted to the District for the work described below for the payment of which sum in lawful money of the United States, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by this agreement.

Whereas, the Principal has submitted the accompanying bid ("Bid") dated _____, for the following project ("Project"):

COMMUNITY STADIUM UPGRADE PROJECT

Now, therefore, if the Principal does not withdraw its Bid within the period specified, and if the Principal is awarded the Contract and within the period specified fails to enter into a written contract with District, in accordance with the Bid as accepted, or fails to provide the proof of required insurance, the performance bond and/or the payment bond by an admitted surety within the time required, or in the event of unauthorized withdrawal of the Bid, if the Principal pays the District the difference between the amount specified in the Bid and the amount for which District may otherwise procure the required work and/or supplies, if the latter amount is in excess of the former, together with all related costs incurred by District, then the above obligation shall be void and of no effect. Otherwise, the Principal and Surety shall pay to the District the penal sum described above as liquidated damages.

Surety, for value received, hereby agrees that no change, extension of time, alteration or addition to the term of the Contract or the call for bids, or to the work to be performed thereunder, or the Specifications accompanying the same, shall in any way affect its obligation under this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition.

In witness whereof the above-bound parties have executed this instrument under their several seals this _____ day of _____, 20__, the name and corporate seal of each corporate Party being hereunder affixed and these presents duly signed by its undersigned representative, pursuant to the authority of its governing body.

(Corporate Seal)

Principal/Contractor

By _____

Title: _____

(Corporate Seal)

Surety

Attach Attorney-In-Fact Certificate

By _____

Title

To be signed by Principal and Surety and Acknowledgment and Notary Seal to be attached.

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BIDDER'S QUESTIONNAIRE
{Not required if Contractor has prequalified}

for

COMMUNITY STADIUM UPGRADE PROJECT

TO THE BIDDER:

In making its award, the Governing Board will take into consideration the Bidder's experience, financial responsibility and capability. The following questionnaire is a part of the bid. Any bid received without this completed questionnaire may be rejected as nonresponsive. The Board will use, but will not be limited to, the information provided herein for evaluating the qualifications and responsibility of the bidder and the bidder's organization to carry out satisfactorily the terms of the Contract Document. The questionnaire must be filled out accurately and completely and submitted with the bid. Any errors, omissions or misrepresentation of information may be considered as a basis for the rejection of the bid and may be grounds for the termination of any contract executed as a result of the bid.

A. Description of Bidder's Organization

1. Firm Name _____

2. Address _____

3. Telephone Number _____

4. Type of Organization

a. Corporation? Yes ____ No ____

If yes, list the officers and positions, and the State in which incorporated.

If the Bidder corporation is a subsidiary, give name and address of parent corporation.

b. Partnership? Yes ____ No ____

If yes, list partner names and addresses

General Partners:

Limited Partners:

c. Individual Proprietorship? Yes ____ No ____

If yes, list name and address of proprietor:

B. Nature of Operations

1. How long have you been engaged in the contracting business under your present business name? _____

2. How many years of experience does your business have in construction work similar to that called for under this bid? _____

3. Have you now contracts, or have you ever contracted, to provide construction for any school district, community college district or county office of education in the State of California?
Yes ____ No ____

a. If "yes," on a separate attached sheet, provide the following information for all construction projects you have had with school districts, community college districts and county offices of education during the last four (4) years:

1. Year contract awarded
2. Type of work
3. Contract completion time called for/actual completion time
4. Contract price

5. For whom performed, including person to call for a reference and telephone number
 6. Location of work
 7. Number of stop notices filed
 8. For each contract, list any lawsuits filed relating to that contract in which you were a defendant or plaintiff
 9. Amount of liquidated damages assessed.
- b. On a separate attached sheet, provide the following information for all construction contracts of a similar nature as called for in this bid that you have had with entities other than school districts, community college districts and county offices of education during the last four (4) years:
1. Year contract awarded
 2. Type of work
 3. Contract completion time called for/actual completion time
 4. Contract price
 5. For whom performed, including person to call for reference and phone number
 6. Location of work
 7. Number of stop notices filed
 8. For each contract list any lawsuits filed relating to that contract in which you were a defendant or plaintiff
 9. Amount of liquidated damages assessed.
- c. For each construction contract that you have failed to complete within the contract time in the last four years please state the reasons for the untimely performance.`

C. Financial and Credit Data

1. If your bid is considered for award, and if requested by the District, will you supply the following data? Yes ____ No ____
 - a. Names and addresses of any banks where you regularly do business.
 - b. The names and addresses of any banks, finance companies, dealers, suppliers, or others where you have notes or loans.
 - c. Give credit references, including at least three trade or industry suppliers with whom you regularly deal.
2. Will you submit on request a balance sheet for the past three (3) years? Yes ____ No ____
3. Where have you engaged in the construction business, or any other type of business, in the last five years?

Name of Business Location Type of Business Years in Business

If any of the business endeavors referred to above are no longer operating, or you are no longer associated with them, please give brief details:

4. The following surety companies may be contacted as references as to the financial responsibility and general reliability of the bidder:

Surety Name Contact Person Phone Number

I certify under penalty of perjury that the foregoing is true and correct. Executed at _____, California, on _____, 20__.

Signature of Bidder _____

Name (*print*) _____

Section 00 45 19

NON-COLLUSION AFFIDAVIT
(TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID)

State of California
County of Humboldt

_____, being first duly sworn, deposes and says that he or she is of _____, the party making the foregoing bid that the bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation; that the bid is genuine and not collusive or sham; that the bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid, and has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or that anyone shall refrain from bidding; that the bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the bidder or any other bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other bidder, or to secure any advantage against the public body awarding the contract of anyone interested in the proposed contract; that all statements contained in the bid are true; and, further, that the bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid, and will not pay, any fee to any corporation, partnership, company association, organization, bid depository, or to any member or agent thereof to effectuate a collusive or sham bid.

I certify (or declare) under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

Date: _____ Signature: _____

State of California
County of Humboldt

On _____, before me, _____, Notary Public, personally appeared

_____, personally known to me (or proved to me on the basis of satisfactory evidence) to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing is true and correct.

WITNESS my hand and official seal.

Date: _____ Signature: _____

[SEAL]

END OF 00 45 19

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**SECTION 00 51 00
NOTICE OF AWARD**

Date:

To: Address:

Project Description: COMMUNITY STADIUM UPGRADE PROJECT

The District has considered the bid submitted by you for the above described work in response to its Notice Inviting Bids for the Project.

You are hereby notified that your bid has been accepted in the amount of: _____
_____ (\$ _____).

You are required to execute the Contract, deliver to the District two fully executed Contracts, and furnish the required Performance Bond and Payment Bond using the bond forms provided in the Contract Documents and the required certificates of insurance within ten (10) calendar days from the date of issuance of this Notice.

If you fail to execute the Contract and to furnish the bonds and insurance within ten (10) calendar days from the date of issuance of this Notice, the District will be entitled to consider all your rights arising out of its acceptance of your bid as abandoned and your Bid Bond forfeited. The District will be entitled to such other rights as may be granted by law.

You are required to return an acknowledged copy of this Notice of Award to the District. Within ten (10) calendar days after you comply with these conditions, the District will return to you one fully signed counterpart of the Construction Agreement.

Dated this _____ day of _____, 20__.

By _____
Authorized District Signature

Receipt of this above Notice of Award is hereby acknowledged by:

_____, this is the _____
day of _____, 200__.

By _____
Title _____

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**SECTION 00 52 00
CONSTRUCTION AGREEMENT FORMS**

CONTRACT NO. _____
(Construction Agreement)

=====

This Agreement shall not be enforceable until ratified and approved by the Redwoods Community College District’s Governing Board. The estimated board meeting is January 2, 2024.

(§1.1) Parties: (Public Agency) **REDWOODS COMMUNITY COLLEGE DISTRICT**
7351 Tompkins Hill Rd., Eureka, CA 95501

(Contractor) _____
Address: _____

(§1.2) Effective Date: _____

(§1.3) The Work: **COMMUNITY STADIUM UPGRADE PROJECT**

(§1.4) Substantial Completion Time: **935 Calendar Days** from the Notice to Proceed.

(§1.4.1) Final Completion Milestone for the Stadium associated work: **60 Calendar Days** from Substantial Completion.

(§1.5) The Bidder acknowledges that this project contains a Final Completion Milestone and bidder agrees that this milestone must be substantially completed and accepted by the Owner before a written “Notice to Proceed” is issued for the demolition of the existing Art Building. Bidder also agrees to pay, as liquidated damages the amounts specified below for each consecutive calendar day after the expiration of the consecutive calendar days allowed for each phase.

(§1.5.1) Liquidated Damages, Substantial Completion **\$2,000/** per calendar day Work is delayed

(§1.5.2) Liquidated Damages, Remaining Work and Final Completion: **\$1,000 /** per calendar day Remaining Work is delayed for 1) Final Completion Milestone (§1.4.1) Community Stadium Upgrade

(§1.6) Public Agency's Agent: **REDWOODS COMMUNITY COLLEGE DISTRICT (“District”)**

(§1.7) Contract Sum: **MILLION, THOUSAND, HUNDRED DOLLARS and NO CENTS**
(\$00,000,000.00)

2. SCOPE OF WORK:

The Work consists of:

1. CONSTRUCTION OF A COMMUNITY STADIUM UPGRADE
2. SITE WORK INCLUDING UTILITIES, PATHS OF TRAVEL, SITE LIGHTING CONDUIT, FLATWORK, LANDSCAPING, AND OTHER SITE DEVELOPMENT

3. ABATEMENT OF HAZARDOUS MATERIALS AND DEMOLITION OF THE EXISTING EQUIPMENT BUILDINGS AND SURROUNDING SITE AREAS
4. OTHER WORK AS INDICATED IN THE CONTRACT DOCUMENTS

3. WORK CONTRACT, CHANGES

- (a) By their signatures below, effective on the above date, these parties promise and agree as set forth in this Agreement, incorporating by these references labor and materials contained in Section 2, Scope of Work.
- (b) Contractor shall, at Contractor's own cost and expense, and in a workmanlike manner, fully and faithfully perform and complete the work; and will furnish all materials, labor, services, equipment, and transportation necessary, convenient and proper in order fairly to perform the requirements of this contract, all strictly in accordance with the Public Agency's plans, drawings and specifications.
- (c) The work can be changed only with Public Agency's prior written order specifying such change and its cost agreed to by the parties; and the Public Agency shall never have to pay more than specified in Section 1.7 without such an order.

4. TIME: NOTICE TO PROCEED AND ACCEPTANCE

- (a) Contractor shall start this work as directed in the specifications or the Notice to Proceed and shall complete it as specified in Section 1, Completion Time.
- (b) Remaining Work after Substantial Completion. If the Architect or District determines that the work required by the Contract is Substantially Complete during any inspection conducted pursuant to this Agreement or Specification Section 01 77 00, Closeout Procedures, the Contractor shall be notified of that determination and the District shall determine if there is Remaining Work. A list of Remaining Work shall be issued only by the District or the Architect and only after the District has certified Substantial Completion. The District or Architect shall give the Contractor the necessary instructions for correction or completion of the Remaining Work, and the Contractor shall immediately comply with and execute such instructions within the Contract Time. Upon completion of the Remaining Work, another inspection shall be made that shall constitute the Final Inspection, provided the Remaining Work has been completed to the satisfaction of the District. If the remaining work has been completed to the satisfaction of the District, the District shall make the final acceptance and notify the Contractor in writing of this acceptance as of the date of Final Inspection.
- (c) Final Acceptance – Upon due notice from the Contractor of completion of the entire project, the District shall make an inspection. If all construction provided for and contemplated by the contract is found to be completed to the District's satisfaction, then that inspection shall constitute the Final Inspection and the District shall notify the Contractor in writing of final acceptance effective as of the date of the Final Inspection.
- (d) Default for failure to Complete Remaining Work In the event the Contract Time expires before the Remaining Work is completed to the satisfaction of the District, the District may provide notice to the Contractor that the Remaining Work shall be completed by Contractor to the satisfaction of the District within ten consecutive calendar days from the date of such notice. The failure of the Contractor to satisfactorily complete the Remaining Work within the ten days shall entitle to District to declare Contractor in default and thereafter terminate the Contract. The ten-day notice provided under this paragraph shall not be construed as adding any time to the Contract Time and is a time period solely for the purposes of providing notice of default.

- (e) Application for Final Payment. After the Contractor has completed all Remaining Work to the satisfaction of the District and delivered all maintenance and operating instructions, schedules, guarantees, warranties, bonds, certificates of inspection, marked-up record documents and other documents as required by the Contract, and after the District or Architect has indicated that the work is acceptable, Contractor may make application for final payment following the Payments Procedures for progress payments. The final application for payment shall be accompanied by all documentation called for in the Contract Documents, together with complete and legally effective releases or waivers (satisfactory to the District) of all liens arising out of or filed in connection with the work on the project.
- (f) Final Payment and Acceptance. If the Architect determines that the work has been completed and the Contractor's other obligations under the Contract have been fulfilled, the Architect shall, within ten working days after receipt of the final application for payment, indicate in writing the Architect's recommendation of payment and present the application to District for payment. Thereupon the Architect shall prepare a Certificate of Final Completion. Otherwise, Architect shall return the application to Contractor indicating in writing the reasons for refusing to recommend final payment. Contractor shall make the corrections identified in the Architect's refusal to recommend final payment. Thirty days after presentation to District of the application and accompanying documentation, with the Architect's recommendation and notice of acceptability of the work, the amount recommended by Architect shall be come due and payable by District to Contractor.

5. LIQUIDATED DAMAGES

5.1 LIQUIDATED DAMAGES - SUBSTANTIAL COMPLETION

If the Contractor fails to complete this contract and this Work within the time fixed therefore, allowance being made for contingencies as provided herein, Contractor becomes liable to the Public Agency for all its loss and damage there from; and because, from the nature of the case, it is and will be impracticable and extremely difficult to ascertain and fix the Public Agency's actual damage from any delay in performance hereof, it is agreed that Contractor will pay as liquidated damages to the Public Agency the reasonable sum specified in Section 1, the result of the parties' reasonable endeavor to estimate fair average compensation therefore, for each calendar day's delay in finishing said Work or Phase of Work; and if the same be not paid, Public Agency may, in addition to its other remedies, deduct the same from any money due or to become due Contractor under this Contract. If the Public Agency for any cause authorizes or contributes to a delay, suspension of work or extension of time, its duration shall be added to the time allowed for completion, but it shall not be deemed a waiver nor be used to defeat any right of the Agency to damages for non-completion or delay hereunder. Pursuant to Government Code Section 4215, the Contractor shall not be assessed liquidated damages for delay in completion of the work, when such delay was caused by the failure of the Public Agency or the owner of a utility to provide for removal or relocation of existing utility facilities.

5.2 LIQUIDATED DAMAGES-THE REMAINING WORK.

The Remaining Work, as such work is determined by the Public Agency or Public Agency's Representative, shall be completed within the Contract Time or any proper extension thereof granted by Public Agency. If the Contractor shall neglect, fail or refuse to complete the Remaining Work within the Contract Time or any proper extension thereof granted by the Public Agency, then the Contractor does hereby agree, as part consideration for the awarding of this Contract, to pay to the Public Agency the amount specified in the Contract, not as a penalty but as liquidated damages for the Remaining Work for each such breach of Contract set forth herein for each and every consecutive calendar day that the Contractor shall be in default after expiration of the Contract Time.

6. INTEGRATED DOCUMENTS

The plans, drawings and specifications and special provisions of the Public Agency's Invitation to Bid, and Contractor's accepted bid for this work are hereby incorporated into this Contract; and they are intended to cooperate, so that anything exhibited in the plans or drawings and not mentioned in the specifications or special provisions, or vice versa, is to be executed as if exhibited, mentioned and set forth in both, to the true intent and meaning thereof when taken all together; and differences of opinion concerning these shall be finally determined by the Public Agency.

7. PAYMENT

- (a) For strict and literal fulfillment of these promises and conditions, and full compensation for all this work, the Public Agency shall pay the Contractor the sum specified in Section 1, except that in unit price contracts the payment shall be for finished quantities at unit bid prices.
- (b) On or about the first day of each calendar month, the Contractor shall submit to the Public Agency a verified application for payment, supported by a statement showing all materials actually installed during the preceding month, the labor expended thereon, and the cost thereof; whereupon, after checking, the Public Agency shall issue to Contractor a certificate for the amount determined to be due, minus five (5%) percent thereof pursuant to the Public Agency's General Terms and Conditions, but not until defective work and materials have been removed, replaced and made good.

8. PAYMENTS WITHHELD

- (a) The Public Agency or its agent may withhold any payment, or because of later discovered evidence nullify all or any certificate for payment, to such extent and period of time only as may be necessary to protect the Public Agency from loss because of:
 - (1) Defective work not remedied, or work not completed, or
 - (2) Claims filed or reasonable evidence indicating probable filing, or
 - (3) Failure to properly pay subcontractors or for material or labor, or
 - (4) Reasonable doubt that the work can be completed for the balance then unpaid, or
 - (5) Damage to another contractor, or
 - (6) Damage to the Public Agency, other than damage due to delays.
- (b) The Public Agency shall use reasonable diligence to discover and report to the Contractor, as the work progresses, the materials and labor which are not satisfactory to it, so as to avoid unnecessary trouble or cost to the Contractor in making good any defective work or parts.
- (c) Thirty-five (35) calendar days after Public Agency files its notice of completion of the entire work, it shall issue a certificate to the Contractor and pay the balance of the contract price after deducting all amounts withheld under this contract, provided the Contractor shows that all claims for labor and materials have been paid, no claims have been presented to the Public Agency based on acts or omissions of the Contractor, and no liens or withhold notices have been filed against the work or site, and provided there are not reasonable indications of defective or missing work or of late-recorded notices of liens or claims against Contractor.

9. INSURANCE

Contractor's Liability Insurance: Before the commencement of the Work, the Contractor shall purchase from and maintain in a company or companies lawfully authorized to do business in California as admitted carriers with a financial rating of at least A status as rated in the most recent edition of Best's Insurance Reports or as amended by the Supplementary General Conditions, if any, such insurance as will protect the Public Agency from claims set forth below, which may arise out of or result from the Contractor's operations under the Contract and for which the Contractor may be legally liable, whether such operations are by the Contractor, by a Subcontractor, by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable.

- (a) Claims for damages because of bodily injury, sickness, disease, or death of any person. District would require indemnification and coverage for employee claim;
- (b) Claims for damages insured by usual personal injury liability coverage, which are sustained by a person as a result of an offense directly or indirectly related to employment of such person by the Contractor or by another person;
- (c) Claims for damages because of injury or destruction of tangible property, including loss of use resulting therefrom, arising from operations under the Contract Documents;
- (d) Claims for damages because of bodily injury, death of a person, or property damage arising out of the ownership, maintenance, or use of a motor vehicle, all mobile equipment, and vehicles moving under their own power and engaged in the Work;
- (e) Claims involving contractual liability applicable to the Contractor's obligations under the Contract Documents, including liability assumed by and the indemnity and defense obligations of the Contractor and the Subcontractors; and
- (f) Claims involving Completed Operations, Independent Contractors' coverage, and Broad Form property damage, without any exclusions for collapse, explosion, demolition, underground coverage, and excavating. (XCU)
- (g) Claims involving sudden or accidental discharge of contaminants or pollutants.

Subcontractor Insurance Requirements: The Contractor shall require its Subcontractors to take out and maintain similar public liability insurance and property damage insurance as required under the above paragraph, titled "Contractor's Liability Insurance, in amounts commensurate with the value of the subcontract. A "claims made" or modified "occurrence" policy shall not satisfy the requirements of the above paragraph, titled "Contractor's Liability Insurance, without prior written approval of the District.

Additional Insured Endorsement Requirement: The Contractor shall name, on any policy of insurance, the District, Architect, Construction Manager, Inspector, the State of California, their officers, employees, agents and independent contractors as Additional Insured. Subcontractors shall name the Contractor, the District, Architect, Construction Manager, Inspector, the State of California, their officers, employees, agents and independent contractors as Additional Insured.

The Additional Insured Endorsement included on all such insurance policies shall be on a CG 2010 11 85 form, CG2033 07 04 (Operations) and a CG2037 07 04 (Completed Operations) or their equivalent, and shall state that coverage is afforded the additional insured with respect to claims arising out of operations and Completed Operations performed by or on behalf of the insured. If the Additional Insured have other insurance which is applicable to the loss, such other insurance shall be on an excess or contingent basis. The insurance provided by the Contractor must be designated in the policy as primary to any insurance obtained

by the Public Agency. The amount of the insurer's liability shall not be reduced by the existence of such other insurance.

Workers' Compensation Insurance: During the term of this Contract, the Contractor shall provide workers' compensation insurance for all of the Contractor's employees engaged in Work under this Contract on or at the Site of the Project and, in case any of the Contractor's Work is subcontracted, the Contractor shall require the Subcontractor to provide workers' compensation insurance for all the Subcontractor's employees engaged in Work under the subcontract. Any class of employee or employees not covered by a Subcontractor's insurance shall be covered by the Contractor's insurance. In case any class of employees engaged in Work under this Contract on or at the Site of the Project is not protected under the Workers' Compensation laws, the Contractor shall provide or cause a Subcontractor to provide adequate insurance coverage for the protection of those employees not otherwise protected. The Contractor shall file with the District certificates of insurance as required under Section 00 70 00, Article 11.6, and in compliance with Labor Code § 3700.

Specific Insurance Requirement: Contractor shall take out and maintain and shall require all subcontractors, if any, whether primary or secondary, to take out and maintain:

- (a) Workers' Compensation Insurance: \$1,000,000.00; Contractor is aware of and complies with Labor Code Section 3700 and the Worker's Compensation Law.
- (b) Comprehensive General Liability Insurance with a combined single limit per occurrence of not less than \$5,000,000.00 and \$10,000,000.00 project specific aggregate, or Commercial General Liability Insurance (including automobile insurance) which provides limits of not less than:

(1)	Per occurrence (combined single limit)	\$5,000,000.00
(2)	Project Specific Aggregate (for this project only)	\$10,000,000.00
(3)	Products and Completed Operations	\$5,000,000.00
- (c) Insurance Covering Special Hazards

The following Special hazards shall be covered by riders or riders to above mentioned public liability insurance or property damage insurance policy or policies of insurance, in amounts as follows:

(1)	Automotive and truck where operated in amounts	\$1,000,000.00
(2)	Material Hoist where used in amounts	\$1,000,000.00
(3)	Explosion, Collapse and Underground (XCU coverage)	\$1,000,000.00
- (d) In addition, provide Excess Liability Insurance coverage in the amount of Two Million Dollars (\$2,000,000.00).
- (e) There shall be no endorsements or exclusions related to soils movement or subsidence including: soil erosion, freezing or thawing, improperly compacted soil or construction defects, roots of trees or shrubs, collapse of storm or sewer drains, or natural occurring shrink or swell soil.

Builder's Risk/ "All Risk" Insurance/ Course-of-Construction Insurance Requirements: The Contractor, during the progress of the Work and until final acceptance of the Work by District upon completion of the entire Contract, shall maintain Builder's Risk, Course of Construction or similar first party property coverage issued on a replacement cost value basis consistent with the total replacement cost of all insurable Work and the Project included within the Contract Documents. Coverage is to insure against all risks of accidental direct physical loss, and must include, by the basic grant of coverage or by endorsement, the perils of vandalism,

malicious mischief (both without any limitation regarding vacancy or occupancy), fire, sprinkler leakage, civil authority, sonic boom, earthquake, flood, collapse, wind, lightning, smoke and riot. The coverage must include debris removal, demolition, increased costs due to enforcement of building ordinance and law in the repair and replacement of damage and undamaged portions of the property, and reasonable costs for the Architect's and engineering services and expenses required as a result of any insured loss upon the Work and Project which is the subject of the Contract Documents, including completed Work and Work in progress, to the full insurable value thereof. Such insurance shall include the District and the Architect as additional named insureds, and any other person with an insurable interest as designated by the District. The **maximum deductible** for this policy shall be **no greater than \$25,000** unless approved by the District.

The Contractor shall submit to the District for its approval all items deemed to be uninsurable. The risk of the damage to the Work due to the perils covered by the "Builder's Risk/All Risk" Insurance, as well as any other hazard which might result in damage to the Work, is that of the Contractor and the surety, and no claims for such loss or damage shall be recognized by the District nor will such loss or damage excuse the complete and satisfactory performance of the Contract by the Contractor.

10. BONDS

Bond Requirements: Prior to commencing any portion of the Work, the Contractor shall furnish separate payment and performance bonds for its portion of the Work which shall cover 100% faithful performance of and payment of all obligations arising under the Contract Documents and/or guaranteeing the payment in full of all claims for labor performed and materials supplied for the Work. All bonds shall be provided by a corporate surety authorized and admitted to transact business in California as sureties.

To the extent, if any, that the Contract Price is increased in accordance with the Contract Documents, the Contractor shall, upon request of the Public Agency, cause the amount of the bonds to be increased accordingly and shall promptly deliver satisfactory evidence of such increase to the Public Agency. To the extent available, the bonds shall further provide that no change or alteration of the Contract Documents (including, without limitation, an increase in the Contract Price, as referred to above), extensions of time, or modifications of the time, terms, or conditions of payment to the Contractor will release the surety. If the Contractor fails to furnish the required bonds, the Public Agency may terminate the Contract for cause.

On signing this contract, Contractor shall deliver to Public Agency for approval good and sufficient bonds with sureties, in amount(s), specified in the specifications or special provisions, guaranteeing faithful performance of this contract and payment for all labor and materials hereunder.

11. FAILURE TO PERFORM

If the Contractor at any time refuses or neglects, without fault of the Public Agency or its agent(s), to supply sufficient materials or workers to complete this agreement and work as provided herein, for a period of ten days or more after written notice thereof by the Public Agency, the Public Agency may furnish same and deduct the reasonable expenses thereof from the contract price.

12. LAWS APPLY: General

Both parties recognize the applicability of various federal, state and local laws and regulations, especially Chapter 1 of Part 7 of the California Labor Code (beginning with Section 1720, and including Sections 1735, 1777.5, 1777.6, forbidding discrimination) and intend that this agreement complies therewith. The parties

specifically stipulate that the relevant penalties and forfeitures provided in the Labor Code, especially in Sections 1775, 1776, and 1813, concerning prevailing wages and hours, shall apply to this agreement as though fully stipulated herein.

13. SUBCONTRACTORS

Public Contract Code Sections 4100-4113 are incorporated herein.

14. WAGE RATES

- (a) Pursuant to Labor Code Section 1773, the Director of the Department of Industrial Relations has ascertained the general prevailing rates of wages per diem, and for holiday and overtime work, in the locality in which this work is to be performed, for each craft, specified in the call for bids for this work and are on file with the Public Agency, and are hereby incorporated herein.
- (b) This schedule of wages is based on a working day of eight (8) hours unless otherwise specified; and the daily rate is the hourly rate multiplied by the number of hours constituting the working day. When less than that number of hours are worked, the daily wage rate is proportionately reduced, but the hourly rate remains as stated.
- (c) The Contractor, and all subcontractors, must pay at least these rates to all persons on this work, including all travel, subsistence, and fringe benefit payments provided for by applicable collective bargaining agreements. All skilled labor not listed above must be paid at least the wage scale established by collective bargaining agreement for such labor in the locality where such work is being performed. If it becomes necessary for the Contractor or any subcontractor to employ any person in a craft, classification or type of work (except executive, supervisory, administrative, clerical or other non-manual workers as such) for which no minimum wage rate is specified, the contractor shall immediately notify the Public Agency which shall promptly determine the prevailing wage rate therefore and furnish the Contractor with the minimum rate based thereon, which shall apply from the time of the initial employment of the person affected and during the continuance of such employment.

15. HOURS OF LABOR

Eight hours of labor in one calendar day constitutes a legal day's work, and no worker employed at any time on this work by the Contractor or by any subcontractor shall be required or permitted to work longer thereon except as provided in Labor Code Sections 1810-1815.

16. APPRENTICES

Properly indentured apprentices may be employed on this work in accordance with Labor Code Sections 1777.5 and 1777.6, forbidding discrimination.

17. PREFERENCE FOR MATERIALS

The Public Agency desires to promote the industries and economy of Humboldt County, and the Contractor therefore promises to use the products, workers, laborers and mechanics of this County in every case where the price, fitness and quality are at least equal.

18. ASSIGNMENT

This agreement binds the heirs, successors, assigns, and representatives of the Contractor; but Contractor cannot assign it in whole or in part, nor any monies due or to become due under it, without the prior written consent of the Public Agency and the Contractor's surety or sureties, unless they have waived notice of assignment.

19. NO WAIVER BY PUBLIC AGENCY

Inspection of the work and/or materials, or approval of work and/or materials inspected, or statement by any officer, agent or employee of the Public Agency indicating the work or any part thereof complies with the requirements of this contract, or acceptance of the whole or any part of said work and/or materials, or payments therefore, or any combination of these acts, shall not relieve the Contractor of Contractor's obligation to fulfill this contract as prescribed; nor shall the Public Agency be thereby stopped from bringing any action for damages or enforcement arising from the failure to comply with any of the terms and conditions hereof.

20. HOLD HARMLESS AND INDEMNITY

- (a) Contractor promises to and shall hold harmless and indemnify from the liabilities as defined in this section.
- (b) The Indemnitees benefited and protected by this promise are the Public Agency and its elective and appointive boards, commissions, officers, agents and employees.
- (c) The liabilities protected against are any liability or claim for damage of any kind allegedly suffered, incurred or threatened because of actions defined below, including personal injury, death, property damage, inverse condemnation, or any combination of these, regardless of whether or not such liability, claim or damage was unforeseeable at any time before the Public Agency approved the improvement plan or accepted the improvements as completed, and including the defense of any suit(s) or action(s) at law or equity concerning these.
- (d) The actions causing liability are any act or omission (negligent or non-negligent) in connection with the matters covered by this contract and attributable to the contractor, subcontractor(s), or any officer(s), agent(s), or employee(s) of one or more of them.
- (e) Non-conditions: The promise and agreement in this section is not conditioned or dependent on whether or not any Indemnities has prepared, supplied, or approved any plan(s), drawing(s), specifications(s) or special provision(s) in connection with this work, has insurance or other indemnification covering any of these matters, or that the alleged damage resulted partly from any negligent or willful misconduct of any Indemnities.

21. EXCAVATION

Contractor shall comply with the provisions of Labor Code Section 6705, if applicable, by submitting to Public Agency a detailed plan showing the design of shoring, bracing, sloping, or other provisions to be made for worker protection from the hazard of caving ground during trench excavation.

22. Not Used

23. WARRANTY

- (a) In addition to any other warranties or guaranties in the Contract Documents, the Contractor warrants, except as provided in paragraph (i) of this clause, that work performed under this contract conforms to the contract requirements and is free of any defect in equipment, material, or design furnished, or workmanship performed by the Contractor or any subcontractor or supplier at any tier.
- (b) (This warranty shall continue for a period of 1 year from the date of final acceptance of the Work, unless otherwise provided or extended in the Contract Documents. If the District takes possession of any part of the work before final acceptance, this warranty shall continue for a period of 1 year from the date the District takes possession.
- (c) The Contractor shall remedy at the Contractor's expense any failure to conform, or any defect. In addition, the Contractor shall remedy at the Contractor's expense any damage to District-owned or controlled real or personal property, when that damage is the result of—
 - (1) The Contractor's failure to conform to contract requirements; or
 - (2) Any defect of equipment, material, workmanship, or design furnished.
- (d) The Contractor shall restore any work damaged in fulfilling the terms and conditions of this clause. The Contractor's warranty with respect to work repaired or replaced will run for 1 year or as otherwise provided or extended from the date of repair or replacement.
- (e) The District shall notify the Contractor, in writing, within a reasonable time after the discovery of any failure, defect, or damage.
- (f) If the Contractor fails to remedy any failure, defect, or damage within a reasonable time after receipt of notice, the District shall have the right to replace, repair, or otherwise remedy the failure, defect, or damage at the Contractor's expense.
- (g) With respect to all warranties, express or implied, from subcontractors, manufacturers, or suppliers for work performed and materials furnished under this contract, the Contractor shall—
 - (1) Obtain all warranties that would be given in normal commercial practice;
 - (2) Require all warranties to be executed, in writing, for the benefit of the District, if directed by the District; and
 - (3) Enforce all warranties for the benefit of the District, if directed by the District.
- (h) In the event the Contractor's warranty under paragraph (b) of this clause has expired, the District may bring suit at its expense to enforce a subcontractor's, manufacturer's, or supplier's warranty.
- (i) Unless a defect is caused by the negligence of the Contractor or subcontractor or supplier at any tier, the Contractor shall not be liable for the repair of any defects of material or design furnished by the District nor for the repair of any damage that results from any defect in District-furnished material or design.
- (j) This warranty shall not limit the District's rights under the Inspection and Acceptance clause of this contract with respect to latent defects, gross mistakes, or fraud.

24. CONSEQUENTIAL DAMAGES

The Contractor and Public Agency waive Claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes:

- (a) Damages incurred by the Public Agency for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and
- (b) Damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit except anticipated profit arising directly from the Work.

This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination. Nothing contained in this subparagraph shall be deemed to preclude an award of liquidated direct damages, when applicable, in accordance with the requirements of the Contract Documents.

25. HAZARDOUS MATERIALS

- (a) If reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos, lead or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and report the condition to the Public Agency in writing.
- (b) The Public Agency shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to verify that it has been rendered harmless. The Public Agency shall furnish in writing to the Contractor the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of such material or substance or who are to perform the task of removal or safe containment of such material or substance. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written notification from the Public Agency and Contractor. The Contract Time shall be extended appropriately.

26. SAFETY

- (a) **Safety Programs.** In addition to and as required by other Sections of the Contract Documents, the Contractor shall be solely responsible for initiating, maintaining and supervising all safety programs required by applicable law, ordinance, regulation or governmental orders in connection with the performance of the Contract, or otherwise required by the type or nature of the Work. The Contractor's safety program shall include all actions and programs necessary for compliance with California or federally statutorily mandated workplace safety programs, including without limitation, compliance with the California Drug Free Workplace Act of 1990 (California Government Code §§8350 et seq.). Without limiting or relieving the Contractor of its obligations hereunder, the Contractor shall require that its Subcontractors similarly initiate and maintain all appropriate or required safety programs. Prior to commencement of Work, the Contractor shall meet with the campus Buildings and Grounds Manager, Project Manager, and Construction Manager to review Contractor's safety precautions and implementation of safety programs during the Work.
- (b) **Safety Precautions.** In addition to and as required by other Sections of the Contract Documents, the Contractor shall be solely responsible for initiating and maintaining reasonable precautions for safety of,

and shall provide reasonable protection to prevent damage, injury or loss to: (i) employees on the Work and other persons who may be affected thereby; (ii) the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody or control of the Contractor or the Contractor's Subcontractors or Sub-subcontractors; and (iii) other property or items at the site of the Work, or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction. The Contractor shall take adequate precautions and measures to protect existing roads, sidewalks, curbs, pavement, utilities, adjoining property and improvements thereon (including without limitation, protection from settlement or loss of lateral support) and to avoid damage thereto. Without adjustment of the Contract Price or the Contract Time, the Contractor shall repair, replace or restore any damage or destruction of the foregoing items as a result of performance or installation of the Work.

- (c) **Safety Signs, Barricades.** In addition to and as required by other Sections of the Contract Documents, the Contractor shall erect and maintain, as required by existing conditions and conditions resulting from performance of the Contract, reasonable safeguards for safety and protection of property and persons, including, without limitation, posting danger signs and other warnings against hazards, promulgating safety regulations and notifying Districts and users of adjacent sites and utilities.

- (d) **Safety Notices.** In addition to and as required by other Sections of the Contract Documents, the Contractor shall give or post all notices required by applicable law and comply with applicable laws, ordinances, rules, regulations and lawful orders of public authorities bearing on safety of persons or property or their protection from damage, injury or loss.

27. Not Used

28. SIGNATURES AND ACKNOWLEDGEMENT

Public Agency, By: _____
Keith Flamer – President/Superintendent

Note to Contractor: (1) Execute acknowledgement form below, and (2) if a corporation, affix Corporate Seal.

Contractor, hereby also acknowledging awareness of and compliance with Labor Code S1861 concerning Worker's Compensation Law.

Contractor:
By: _____ (CORPORATE SEAL)
(Designate Official Capacity – **COMPANY NAME**)

Print NAME and TITLE

License Number

Federal ID Number

NOTARY PUBLIC

=====

State of California)ss. ACKNOWLEDGEMENT (By Corporation, Partnership or Individual)
County of Humboldt)

The person(s) signing above for Contractor, known to me in individual and business capacity as stated, personally appeared before me today and acknowledged that he/she/they executed it and that the corporation or partnership named above executed it.

Dated: _____

(NOTARIAL SEAL)

END OF SECTION 00 52 00

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SECTION 00 54 36
BUILDING INFORMATION MODELING (BIM)
EXHIBIT I

1. General

The contractor shall create a construction model that shall be used for the coordination of all trades. The contractor shall be responsible for providing accurate as-built information in a timely manner for the duration of the project. Contractor will be allowed to use a design model as a reference. The design intent model is only for reference purposes and the Revit electronic model file cannot be used as the basis for the construction model either through copying and pasting Revit objects or by renaming the Revit file name. The design model will contain the Revit objects and floor plan and elevation views but will not contain sheets, sections views, and detail(annotation) views. It is expected that the contractor will create these BIM elements as part of creating the construction model.

The Construction model is to be created new from the construction documents, shop drawing models, fabrication models, and any coordination model. At a minimum, once a week, during construction the updated construction model will be published and posted to the BIM 360 Collaborate Site. The contractor shall be responsible for providing and maintaining the BIM 360 Collaborate site for the duration of the construction and closeout of the project. However, the District shall have administrative rights to the BIM 360 Collaborate site.

The Contractor will provide a total (3) three licenses of BIM 360 Collaborate for use by the District, the Construction Manager and the Design Team members. The licenses are to be provided within 15 days of Contractor award. The licenses will remain active for the entire duration of the project and for an additional six months after Final Acceptance of the building. Contractor will provide all needed Revit, Navisworks and BIM 360 Collaborate licenses for their own forces as well as for subcontractors.

2. BIM Execution Plan

The Contractor shall review the Design team's BIM execution plan and submit questions within thirty (30) days of contract award. The design team and the District shall review and respond to the request within (14) days of submittal.

Contractor will submit an outline of the Construction BIM Execution Plan within (15) days of contractor award. Within (45) days of contractor award the Contractor will submit the Construction BIM Execution Plan. The format and scope of the Construction BIM Execution Plan will be similar to the Design Team's BIM Execution Plan but will contain information specific to creating construction models and will confirm the BIM requirements listed in Section 00 54 36. The design team and the District shall review and respond with any comments to the submitted Construction BIM Execution Plan within (14) days of submittal.

Within (10) days of the Construction BIM Execution Plan being accepted the Contractor will hold a Construction BIM Execution Plan Kick Off Meeting. All key subcontractors, the Contractor's BIM Manager, Architect, Construction Manager and the District will be invited to the meeting. The purpose of the meeting will be to review the Construction BIM Execution Plan.

3. Collision Reports

The Contractor is to use Navisworks Manage software for collision reporting. Collision reports from Navisworks should be published weekly in a standard XML, HTML, or Text format as created by Navisworks. These reports shall include the following information at a minimum:

- Description of Collision Report
- Date of Collision Report Run
- List of all Collisions detected, their status, and their proposed solution.

All Navisworks collision information will be uploaded to the BIM 360 Collaborate Site. At the Contractor's option the Contractor can use BIM 360 Collaborate for collision reporting if in certain situations it is more suitable or expedient than Navisworks.

4. Concurrent As-Builts

General

The contractor shall submit a plan to the District for review, prior to the start of construction that outlines the process for concurrent as-built documentation. Concurrency is mandated. Methods for recording as-built information are left to the discretion of the contractor. Potential options include traditional methods, and/or periodic laser scanning of completed or partially completed primary systems coordinated with the sequence of construction. Primary systems include, but may not be limited to: structural framing, primary HVAC duct runs, primary fire protection main runs, primary electrical conduits (larger than 3/4" diameter), and ceiling grids layouts. This information should also be included in the Construction BIM Execution Plan.

5. Scheduling

The sequence of concurrent as-builts shall be recorded in the contractor's project schedule as a line-item event.

6. Commissioning Requirements

Commissioning data including but not limited to design intent, performance criteria and operations data shall be recorded and/or linked to the BIM Compliant model as commissioning occurs throughout the project. Commissioning requirements shall be coordinated with the requirements noted in the construction documents. It shall be the contractor's responsibility to coordinate the information sources and integrate this information into the BIM Compliant model for transfer at the completion of the project.

7. Terminology

As-Built Documents

As-built documents are the collection of paper drawings or electronic drawings that typically reside in the contractor's onsite trailer that contain mark-ups, annotations, and comments about changes that have been made to the contract documents during the construction phase.

As-Built Model

Design Intent Models that have been updated throughout the construction process. These changes and updates have been communicated from the Contractor to the Design Team through the comments, annotations, and mark-ups from the As-Built Documents. These typically, but not always, are discipline specific models.

BIM Execution Plan (BEP)

A plan that is created from Design BIM Execution Plan. The BEP helps to define roles and responsibilities within a project team.

Critical Path Modeling

Critical Path Modeling Is a method of demonstrating Integrated Project Delivery. It sets a plan within the design team that accounts for the activities of each discipline and how they interact with each other. It builds upon a critical path method for those activities, and allows the project team to schedule a complete project.

Design Team

The Design Team is considered to be the Architect and all of the consultants that provide design services for a project. These design services can be rendered at any time during the project.

.DWF is a file type that was developed by Autodesk to be locked file for drawing sheets and model data. It can be used as a file transfer for estimating data, markups, and other third-party software. It can be a combination of 3D and 2D information within the same file.

.DWG is a native AutoCAD file format. It is a widely used file format for exchanging drawing information and 3D information to different programs. While not a database file type, it still has lots of uses for exchanging information.

.GBxml file is a Green Building file type. It is used to run simulations through energy modeling software. It is a widely accepted file format for those types of software.

LEED

The Leadership in Energy and Environmental Design (LEED) Green Building Rating System is a suite of standards for environmentally sustainable construction. Based on a point system, a building can achieve different ratings based on the performance of the design, construction, and operation of the building.

Navisworks

Navisworks is software that allows for the viewing of multiple model formats. This ability to “view” these files also allows for Navisworks to simulate the interaction between model files. That includes collision reporting, time lining, and coordination.

.NWC file is a Navisworks Cache File that is used by Navisworks to quickly read many other file types. All linked files in Navisworks have an ***.NWC*** file created automatically. In addition, Revit will export directly to the very small file type of ***.NWC*** for quick access by Navisworks.

.NWD A much larger file than the ***.NWC***, the ***.NWD*** file shows a snapshot in time of Navisworks file. No linked files exist but all geometry is included.

.NWF file is a native Navisworks file which has all linked files, clashes, markups, animations, schedules, etc.

Record Drawing

The production of Record Drawings is the capturing of the As-Built Document’s annotation, comments, and mark-ups in a drawing format only. This does not typically include the updating of any models.

.RVT

An ***.RVT*** file is a native REVIT file type. It is also the deliverable file format for all projects. This includes all of the Design Team’s models.

8. Project Closeout

1. As part of the closeout process the Contractor will submit the following to the District:
 - a. Scanned Field Set Drawings – As-Built (pdf format)

- b. O&M Manuals (paper/.pdf/excel format)
- c. Coordination Models in their native file format

9. Contractor's Key BIM Personnel

1. The Contractor must have a BIM Manager on staff with at least 3 years of proven construction coordination experience with projects similar in size a scope to District project. Submit the BIM Managers resume at the same time of the Contractor's Project Manager or Superintendent. The BIM Manager's responsibilities include, but are not limited to the following as well as Sub-Section 10 below:
 - d. Lead the BIM Construction Coordination Team and be the main point of contact for the coordination process.
 - e. Ensure all BIM Construction Team Members follow the requirements of the District's BIM Guidelines and the Contractor's BIM Execution Plan.
 - f. Ensure the BIMs are of optimum quality and appropriate level of development (LOD) for the current BIM Coordination activities.
 - g. Make sure all models from all disciplines are uploaded according to the BIM Coordination Schedule on time and in the correct file formats.
 - h. Assemble all discipline's BIMs into a Consolidated Model for coordination.
 - i. Maintain the master Construction BIM coordination files with all disciplines integrated on a BIM Collaboration Server.
 - j. Provide regular Clash Reporting for BIM Construction Team members and other project stakeholders to review.
 - k. Deliver a clash-free fully coordinated Consolidated BIM Model.
 - l. Have a solid working knowledge of AEC BIM collaboration software and any other software tools to be used for BIM and model checking.
 - m. Serve as the Point of Contact for all internal and external BIM's with District and the Design Team.
 - n. Have pro-active approach to problem solving and ensuring that everyone has what they need when they need it.

10. Construction Roles and Responsibilities

10.1 Roles

10.1.1. BIM Manager: BIM Manager for Contractor

1. Management and implementation of the BIM Coordination process.
2. Administer access to BIM and the tools used to facilitate the coordination process.
3. Identify major coordination issues through the use of clash detection.
4. Provide markups of the model within the coordination tool.
5. Facilitate team in resolving issues by offering solutions to conflicts.
6. Assist the team with clashes that could not be resolved in trade-to-trade coordination.
7. Create sign-off files and narratives.

8. Provide extensive support as it relates to software and workflow.

10.1.2. Trade Coordinator: Each trade shall have a lead contact and decision maker who will be required to attend coordination meetings.

1. Make decisions for movements in coordination to resolve clashes.
2. Verify that components are modeled to the correct Level of Detail (LOD) and match submittal data.
3. Run independent clash detection within the collaborative software chosen by Contractor after each daily update.
4. Create markups to be reviewed during coordination meetings, and communicate with other trades in an attempt to resolve the markups.
5. Evaluate constructability, sequencing, installation requirements, and means and methods of systems that are considered and incorporated in the model effort during coordination.
6. Ultimately responsible for making sure models are being uploaded on time and are complete.
7. Ensure uploads are completed on time, as requested by BIM Manager.
8. Provide shop drawings for sign off of each phase of BIM.
9. Provide equipment submittals and/or cut sheets when requested.
10. Ensure that the standards listed in this document are met before each upload.

10.1.3. Trade Modeler: Main modeler for each respective trade (responsibilities may be merged with Trade Coordinator).

1. Modeling of trade systems and components.
2. Required to attend coordination meetings as needed.
3. Coordinate adjustments to the model to resolve clashes.
4. Upload models daily and when requested by BIM Manager or Trade Coordinator
5. Provide quality control of responsible models to be used in BIM.

11. Construction Models and Development

This BIM is known as the “Construction Model”. It includes models provided by of the subcontractors, which will be managed and kept current by the Contractor through the lifecycle of the project with all resolved constructability issues, Change Orders and RFI’s for the record set. The construction models are to be developed with fabrication software. There should not be a conversion process from construction to fabrication unless agreed upon by the contractor. This is to avoid problems with the conversion as well as identify constructability issues within the design during the population process of each model.

Naming Convention

11.1.1. File Naming

1. Typical Syntax (for projects with one package of contract documents): ProjectName-Discipline-Building.Level.file.type. Include proposed file naming in the BIM Execution Plan.

- A. All caps, single dashes, no underscores, no spaces, no dates, no project numbers.
- B. The internal file name is the same name uploaded to BIM 360 Collaborate.

11.1.2. Layer or Workset Naming

1. Layers should be descriptive of the elements they contain:

A. For Example: PL-DCW-Valves = Plumbing – Domestic Cold Water – Valves

B. For Example: PL-DCW-Valves-Clear = Plumbing – Domestic Cold Water – Valves – Clearances

11.1.3. Object naming

1. Any element or component name within a model shall reflect the component or system installed

2. For Example: A block modeled to represent an AHU should have the AHU number associated with it in the naming convention (AHU1).

2. Modeling Standards

11.2.1. Project Origin

1. The civil Engineer will provide Control Points to be used by the Design team as a reference for developing the project gridlines and setting the survey point and base point in Revit for the project.

2. The project origin (X,Y,Z) will be defined in the Architectural Design Intent Model. Usually, this will be located at one corner of the property line boundary.

3. It is the Architect responsibility to verify the accuracy of the coordinates and to provide a grid intersection at 0,0,0 for all other team members.

11.2.2. Worksets

1. All Revit models will be “shared projects” (worksets enabled).

2. An existing model shall be an exception to this standard.

11.2.3. Levels & Grids

1. All Levels and Grids must be “Copy-Monitored” from the architectural model, and remain “Monitored” throughout the project.

2. All Levels and Grids must be located on the “Shared Levels and Grids” workset / layers. This allows other project participants to easily hide the grids from linked models.

11.2.4. Model Sharing

1. Tool

A. The project will be using BIM 360 Collaborate to facilitate and coordinate the models produced.

B. BIM 360 Collaborate will host all of the most current and design models from each participating discipline.

2. Folder Structure and models

A. See appendix “A” for file folder structure

B. The naming of the models uploaded to the corresponding discipline folder shall stay consistent

C. The location shall be verified after each upload. See appendix “H” for upload workflow

11.2.5. Reference Levels

1. All objects should be placed on the correct reference level or floor level

2. If objects are elevated above reference levels, they should be referenced from the proper elevation callout. This ensures proper collaboration and integration of the BIM with the project team and their respected software.

11.2.6. Object Heights

1. All objects modeled should fall within the proper reference levels. For example, walls, both exterior and interior functioning, should be modeled to begin at floor height and continue only to the elevation reference line directly above.

11.2.7. DO NOT MODEL OBJECTS TWICE

1. One exception may be when a vertical pipe is passing floor to floor, it is beneficial to verify that the location below matches the location above

11.2.8. Analytical Objects

1. All referenced objects that do not pertain to the model it is located within should be excluded from uploads
2. Use Xref's or links to eliminate having to clean the model at every point of upload

11.2.9. Purging Models

1. When uploading or sharing a model, there should not be any of the following:

- A. floating objects
- B. objects that do not pertain to the model
- C. layers that do not contain any components

11.2.10. Object Types

1. Floors

- A. All floors should be modeled at the right reference plane to ensure proper dimensioning and takeoff.
- B. Shafts and vertical opening should be used to cut voids through horizontal planes. Editing the face of each wall should be discouraged unless reasoning dictates the cut should be made.
- C. Floor thickness should reflect the slab and deck total thickness

2. Walls

A. Types

11.2.10.2.A.1 Basic Walls - used to define architecture scope of interior and exterior walls. Structural Walls - used by the structural team to define shear walls and structural bearing walls.

11.2.10.2.A.2 Curtain Wall Systems - exterior wall systems used to define assemblies that extend in heights above 9'-0".

11.2.10.2.A.3 Exterior Glazed Wall Systems - glass wall assembly systems

11.2.10.2.A.4 Storefront Systems - glass wall assembly systems that are between 7'-0" to 9'-0".

11.2.10.2.A.5 Window Systems – glass window assembly systems that are between 7'-0" or less.

11.2.10.2.A.6 Fire Rated Walls – used to define the fire barrier within the wall

11.2.10.2.A.7 Shaft Walls – Used to define the shaft wall condition

11.2.10.2.A.8 By choosing the proper wall type, the team can ensure that all assembly codes and data information attached to each object will be correct.

11.2.10.2.A.9 All objects modeled should fall within the proper reference levels. Walls, both exterior and interior functioning, should be modeled to begin at floor height and continue only to the elevation reference line directly above

11.2.10.2.A.10 Wall and Openings by Face should be utilized to cut voids through the vertical faces of wall assemblies. An “edit profile” command can be used if necessary, or if the “Wall Openings” and “Openings by Face” commands cannot create the desired object effect.

B. Object Description vs. Modeling/Drawings

C. All descriptions given to the object must match the objects parameters/ data

D. Example: a description of a column footing will say “F7” to indicate a 7’-0” x 7’-0” x 3’-6” footing; the footing must be drawn/modeled to the description. This will ensure that all objects are correct in the BIM and be able to help the project team coordinate other systems that may run close to said objects.

E. Example: a description of a partition wall that terminates 6” above the ceiling plane. The wall should be drawn to terminate above the ceiling plane (wall height will be determined by Design Project Team).

11.2.11.Object Information Input

1. Object Function

A. Choose the function of the wall from the following categories using Uniformed codes: Interior

11.2.11.1.A.1 Exterior

11.2.11.1.A.2 Foundation

11.2.11.1.A.3 Retaining

11.2.11.1.A.4 Core-Shaft

11.2.11.1.A.5 Soffit B. Choose the proper category for equipment such as:

11.2.11.1.B.1 Mechanical Equipment

11.2.11.1.B.2 Electrical Equipment

11.2.11.1.B.3 Fire Protection Equipment

11.2.11.1.B.4 Plumbing Equipment

11.2.11.1.B.5 Plumbing Fixtures

11.2.11.1.B.6 Electrical Fixtures

2. Data Integration

A. At a minimum, all information found on the stamped Record Set of 2D drawings is to be integrated. These fields are to include all information commonly found as (but not limited to): Notes, Schedules*, Type Mark, Description, Detail, Nameplate Data, Key Notes, Sheet Notes, SOO, Specific Nameplate Data.

11.2.11.2.A.1 Fully Developed Schedules* to include, but not limited to this sample set:

11.2.11.2.A.1.1 Lighting

11.2.11.2.A.1.2 Doors – full detail and ratings, assembly

11.2.11.2.A.1.3 Equipment – nameplate data set

11.2.11.2.A.1.4 Fire Alarm

11.2.11.2.A.1.5 Flow and control diagrams – locations, control points, notes

11.2.11.2.A.1.6 HVAC

11.2.11.2.A.1.7 Plumbing fixture schedule - associated data fields, notes

11.2.11.2.A.1.8 Plumbing systems components schedule DWV – detail, notes

11.2.11.2.A.1.9 Mechanical ventilation compliance – room name, number, type designation, air balance, ACH, exhaust, supply, volume, transfer, ceiling height, balance to corridor, etc.

11.2.11.2.A.1.10 Electrical Distribution

11.2.11.2.A.1.11 Panel schedules – panel full detail, system branch, isolation, service locations, load, feeder, voltage, etc.

11.2.11.2.A.1.12 Partition, Area Separation, and similar Rated Assemblies

B. All equipment (pumps, AHU, FCU, boilers, etc.) must include manufacturer specific information, within the model, and field verified for accurate representation in the model. Refer to LOD matrix Attachment #1 for more information.

C. All systems that are non-accessible must be field verified for location.

D. All items that have room number attributes shall have place holder for a second room number.

11.2.12. Logistics

1. All BIM Construction Team members involved in the construction model coordination process shall cooperate and compromise with one another to develop combined solutions that achieve the project's goals and overall design intent.

2. As previously mentioned, the architectural, Structural and MEP design work will be made available with Revit 2018, respectively, and/or other details provided in 2D format. These backgrounds / models can be utilized by the subcontractors in the 2D and/or 3D environment. These construction models will be further detailed by the responsible subcontractors.

3. While populating, each trade should be in conversation with the trades around them.

4. Coordination outside of the BIM meetings will be required for items such as, but not limited to, housekeeping pads, IT equipment, and small conflicts between 2 trades.

11.2.13 Scheduling

1. Contractor will develop a modeling/coordination schedule that will align with the overall construction schedule. Contractor will be required to maintain this schedule so that the modeling/coordination schedule and the overall construction schedule are maintained.

11.2.14. Coordination Concept

1. Construction Coordination

A. Clash Detection

11.2.14.1.A.1 Software will analyze the BIM for physical interferences (clashes) between building systems and components. Construction level clash detection results in a reduction of field conflict, RFI's, and change orders. Coordination with off-site prefabricated components is improved. Construction helps avoid budget and schedule conflicts

B. Clearance Checking

11.2.14.1.B.1 It is accomplished by adding a clearance element, on a separate layer, to the model that requires a clearance. Modeling and clashing equipment clearances helps identify access, installation and code related clearances for facilities management and maintenance.

C. Clash Resolution

11.2.14.1.C.1 Conflicts found during clash detection need to be resolved within the fabrication BIM authoring platform in order to be incorporated into shop drawings. Virtually solving the issue ahead of time avoids costly errors and revisions as well as schedule impacts and occupancy delays

D. Coordination Sign-Off

11.2.14.1.D.1 After construction coordination is complete, a set of 2D and 3D coordination drawings are to be created with the BIM Construction Team and Architect submittal review.

11.2.15. Modeling Requirements

1. General Requirements

A. Model clearance requirements - Areas which must remain clear for code or service consideration including but not limited to insulation, monokote, equipment, access clearance around piping or other systems requiring a code specific clearance. All in-wall system equipment and devices to be modeled.

B. Model wall and ceiling access doors where required.

C. Model working area around J-boxes, panels, etc.

D. Model working area around A/V equipment.

E. Model swing area around panel doors.

F. Elevated access zones are to be modeled from the top of the eqp. to the floor below.

G. Pre-fabrication - anything that will be pre-fabricated should be included in the BIM. This will ensure proper spacing and connections.

H. Supports/ seismic braces will be required in the BIM.

I. Model all in wall or surface mounted devices and or equipment

2. Architectural Model

A. Wall thickness and height - required for routing main utilities, locating VAV boxes, identifying priority wall framing, wall penetrations, fire stopping.

B. Walls, slabs, Doors, Interior Windows, and signage.

C. Hard ceilings and soffits - required for identifying structural integration and clearances, HVAC diffuser locations, electrical fixture locations, and routing of utilities.

D. Suspended acoustical ceilings - required for identifying structural integration and clearances, HVAC diffuser locations, electrical fixture locations, and routing of utilities.

E. Exterior walls and storefronts - required for identifying the location of rain water leaders.

F. Shaft/Chase walls - required for identifying the correct locations of plumbing vents and HVAC shafts.

G. Architectural features requiring utilities - required for mechanical routing.

H. Architectural features in mechanical spaces - required for mechanical routing.

3. Cold Steel Framing Model

A. Top and bottom track, kickers, and zclips to be used for coordination.

B. Framing/block-outs for MEP trades as needed.

C. Door framing and headers.

D. Head of wall conditions.

E. Any no-fly zones required for installation or representation of an object.

4. Structural Model

A. Beams and columns - required for coordinating above ceiling MEP/FP utilities.

B. Braces and gusset plates - required for coordinating above ceiling MEP/FP utilities.

C. Miscellaneous supports - required for coordinating above ceiling MEP/FP utilities.

D. External wall framing connections - required for coordinating with MEP/FP and Architectural trades.

E. Beams penetrations - required for coordinating above ceiling MEP/FP utilities.

F. Decking layout, Bent plates, and deck closures.

G. Base isolators with required clearances and access paths for removal

H. Lateral dampers along with required clearances.

5. HVAC Model

A. CAV's/VAV's/Phoenix Valves/FCU's/Humidifiers/AHU's or any other mechanical equipment and the associated access or code related clearance.

B. Valve train components and associated access or code related clearance.

C. Medium pressure duct and SMACNA required reinforcement and supports - required for coordination and routing of other trades.

D. Low-pressure duct and SMACNA required reinforcement and supports - required for coordination and routing of other trades.

E. Shaft locations and supports- required for coordination and routing of other trades and for locating smoke dampers, etc.

F. Fire smoke dampers - required in coordination, especially if walls are also provided in the model.

G. Flex ducts - required for showing how low-pressure ducts connect to the diffusers.

H. Diffuser locations and sizes - required for coordination of finish utilities with the other fixtures in a room (like electrical fixtures, etc.).

I. SMACNA required reinforcement and supports - Hangers and seismic bracing - required for coordination and routing of other trades and for inserting the deck correctly before installation begins.

J. HVAC piping to VAV and CAV boxes - required for coordination and routing of other trades.

K. All equipment and clearance plus access zones- required for coordination and routing of other trades (can be drawn as 3D blocks with accurate connection points).

L. CAV & VAV Boxes including all access zones required for maintenance.

M. Motors and access to motors/thermal resets, disconnect switches, and Damper access doors.

N. Insulation

O. Structural equipment pads

P. Access zones, no Fly zone (Radiant tubing areas).

Q. Wall and ceiling access doors (access zones shown above and below).

6. Mechanical Piping

- A. All ½” piping required for building system function
 - B. All insulation required
 - C. All equipment and housekeeping pads
 - D. All Valves
 - E. High point vents, drains, low point valves, etc.
 - F. Hangers and seismic bracing - required for coordination and routing of other trades and for inserting the deck correctly before installation begins.
 - G. Seismic joints and movement clearances
 - H. Access and clearance zones required
 - I. Wall and ceiling access doors (access zones shown above and below).
7. Electrical Model—including under slab electrical and low voltage
- A. All Conduit or bundles of wiring adding up to 1 1/2” in diameter and above are to be modeled. All homerun conduits from panel to homerun junction box will be modeled.
 - B. Feeder conduit - required for coordination with other trades.
 - C. Junction boxes associated with modeled devices or conduit homeruns required for coordination with other trades.
 - D. Lighting fixtures - required for coordination with other trades and finish utilities like ceiling grid, sprinkler heads, HVAC diffusers and specialty lighting.
 - E. Lighting supports and seismic required for architectural lighting that exceeds 20lbs. - required for routing and coordination of other trades.
 - F. Cable trays and supports - required for coordination with other trades.
 - G. Trapeze pathways for home runs - required for coordination.
 - H. Outlets and switch locations in rooms - Architectural model determines locations.
 - I. Hangers and seismic bracing associated with conduit home runs, large feeder runs, or trapeze pathways- required for coordination with other trades and for inserting the deck.
 - J. Equipment panels - required for coordinating with wall framing to determine backing, etc.
 - K. Electrical rooms - required for coordination with wall framing and other trades.
 - L. Fire alarm devices and equipment only - required for coordination with other trades.
 - M. Wall devices that could impact in-wall coordination.
 - N. Structural equipment pads
 - O. Access zones
 - P. Wall and ceiling access doors (access zones shown above and below).
8. Plumbing Model—including under slab plumbing.
- A. All piping ½” and greater along with any valves are to be modeled.
 - B. Plumbing fixtures including trap primers- required for coordination with other trades.
 - C. Graded cast iron pipe lines - required for coordination with other trades.

- D. Waste and vent lines - required for coordination with other trades and with architectural walls and shafts.
 - E. Cold and hot water piping including valves- required for coordination with other trades.
 - F. Gas piping and gas mains including valves, ZVB's, headwalls, etc. - required for coordination with other trades.
 - G. Piping to associated equipment
 - H. Hangers and seismic bracing -required for coordination with other trades and for inserting before installation.
 - I. Boiler and other equipment -required for coordination (can be drawn as 3d blocks with accurate connection points).
 - J. Specialty piping -required for coordination with other trades
 - K. Structural equipment pads
 - L. Insulation
 - M. Access zones
 - N. Wall and ceiling access doors (access zones shown above and below).
9. Sprinkler Model
- A. All piping ½" and associated valves or equipment greater are to be modeled.
 - B. Sprinkler mains and branches - required for coordination with other trades.
 - C. Sprinkler head drops –required for coordination with finish utilities like electrical lighting, diffusers, etc. Avoid using elements that are nonmanipulatable for connection to heads.
 - D. Sprinkler pipes - required for coordination with other trades.
 - E. Hangers -required for coordination with other trades.
 - F. Seismic bracing.
 - G. Clearance zones.
 - H. Access zones.
 - I. Wall and ceiling access doors (access zones shown above and below).
10. A/V Model
- A. All Conduit or bundles of wiring adding up to 1" in diameter and above are to be modeled
 - B. Rough-in of ceiling support locations
 - C. Project light paths - useful to ensure proper viewing of projector image.
 - D. Cable tray -required if an extra tray is used for A/V.
11. Controls
- A. Wall mounted panels, terminal cabinets, in-line devices and other equipment including all clearances and access zones
 - B. All conduit required for coordination
12. Site Utilities
- A. All systems ¾" and greater

B. All fittings, valves, reinforcements, manholes, pumps or other eqp.

C. All clearances and access zones

13. Equipment

A. All Equipment that may affect the design or dimensions of a room

B. All point of connections

C. Access zones

D. Seismic bracing

11.2.16.Coordination Prioritization

1. The Construction coordination process will not interfere with the construction schedule. This Construction Coordination timing is critical so the team can receive approvals required prior to the first construction deck activity.

A. HVAC and Plumbing contractors will need to procure pipe anchor embeds to meet early concrete work as indicated in the schedule.

B. HVAC and Plumbing contractors will need to obtain approval on the seismic joints early in order to model the final locations correctly that correlate with the anchor locations. M&P contractors will drive anchor wall heights depending on routing and seismic joint elevation limitations.

C. Early approvals of major AHU and FCU equipment to ensure model connection points of the approved product and included in model

D. It is critical to the coordination process that the trades that will require seismic engineering, engage their preferred engineer as early as award. It is suggested that the project team utilize the same engineer to avoid unnecessary conflicts and engage in a more efficient seismic layout.

11.2.17.BIM Team Scopes

1. During BIM Construction coordination, modeling scopes will be prioritized by the Contractor per the requirements of the contract documents and the Contractor's Coordination Schedule.

2. Subcontractors shall develop 3D fabrication model for coordination with sufficient level of detail for accurate coordination.

3. Shop drawings shall be produced from the models used for construction coordination.

4. In general, all work in scope shall be modeled in the 3D environment.

11.2.18.Model Ownership

1. During construction, major ownership of the Construction Model is held by the Contractor., and contracts with all model authors (i.e.: subcontractors, consultants, etc.). The model authors are individually responsible for the content and outcome from the use of their model in the BIM.

2. At project completion, the ownership is transferred to the Contra Costa County Community College District.

11.2.19.Infrastructure

1. Common Platform

A. The primary collaboration platform is BIM 360 Collaborate. Access to BIM 360 Collaborate will be provided to each participating party by the Contractor, Subcontractors may consider Navisworks as alternatives for those additional users if appropriate. Access to software must not impact the performance of any team members.

2. BIM File Sharing

A. BIM 360 Collaborate will be used for collaboration and file sharing, with access rights provided by the Contractor. and file sharing for miscellaneous use by the subcontractors.

3. Hardware / Equipment

A. All participants will be expected to provide all necessary computers, software, and peripherals with sufficient capacity to ensure a reliable work flow.

11.2.20.Process

1. Model Flow Summary

A. Model flow is an iterative process involving the Model Authors, Model Managers, and the common model communication platform is BIM 360 Collaborate for this project.

B. The model flow begins with a Model Author and the design intent which it is derived from (plans, specifications, and RFI responses, etc.). The Model Authors predominantly communicate directly with the common platform, calling on any other model which they need to coordinate with, review, or back check. They also speak through the Model Managers for the following reasons:

11.2.20.1.B.1 Issues requiring contractor Input

11.2.20.1.B.2 Cumbersome coordination items / multi-trade

11.2.20.1.B.3 Model QA / QC by management

2. Design changes and RFI's

A. As RFI's and CO's are distributed, it is each trades responsibility to review and implement the response into their model. A log that documents this implementation will be kept and maintained by each trade and provided to the Contractor upon request.

B. Distribution of this log will be required prior to any BIM coordination meeting.

11.2.21.Model Collaboration

1. Each of the sub-contractor disciplines has communications through the General Contractor.

2. Contractor will assist the project team in determining when their model / plans need to change due to coordination results. Contractor, will be able to manage these communications by receiving a copy of any email, file transfer, or other means to satisfy open communications and keeping managers "in the loop."

3. BIM 360 Collaborate – Online Cloud-Based Collaboration tool.

4. It is strongly recommended to "Collaborate" on a regular basis (daily). Each participant does their own work and asked to share and correct their own model. It also recommended to visually inspecting each upload for quality that could impact other trades. BIM 360 Collaborate will automatically notify other parties and the Contractor's BIM Manager.

5. Through BIM 360 Collaborate, Contractor's BIM manager will be able to regularly (daily) monitor the coordination activities from each participant and how the activities were performed.

11.2.22. Process Flow

A. Detailing

11.2.22.1.A.1 Areas/zones for priority coordination are established by and scheduled by the Contractor. The schedule will direct the Team's focus on a week-by-week basis.

11.2.22.1.A.2 The subcontractor references the applicable 2D and 3D data to conduct its modeling.

B. Coordination & Clash Detection Process

11.2.22.1.B.1 The subcontractor produces a fabrication model based on the information provided and uploads their own model to BIM 360 Collaborate for collaboration and clash detection.

11.2.22.1.B.2 Each subcontractor will be responsible for resolving clashes of their trade by collaborating and communicating outside of Clash detection meetings in order to reduce the amount of conflict prior to these meetings.

11.2.22.1.B.3 The first clash detection and resolution meeting is hosted by the Contractor who has reviewed the unresolved model clashes and saved each as a viewpoint prior to the meeting. Through the meeting, resolutions are assigned and recorded among the trades

11.2.22.1.B.4 This process is repeated, requiring trades to review updated models and coordinate around any newly discovered clashes caused by their work, other subcontractors' work, and/or vendors until a given area is fully coordinated.

2. Coordination Expectations

A. It is expected that the trade contractors will perform QC checks for their discipline for completeness and design intent.

B. Each subcontractor shall be responsible for updating backgrounds and models with all approved Change Orders affecting them, constructability review items, and any RFI responses throughout the project. They shall also raise to the attention of the Contractor any previous construction model issues not updated within the current construction model.

C. The BIM process is suited to improve coordination of the design and construction process, as well as deliver improved information for facility management. Required files and documents will be uploaded to the Contractor's designated collaboration site. The Contractor and Sub-contractors are required to coordinate models between specialties to verify clearance, analyze conflicts/clashes and deliver quality documentation to reduce RFI and Change order submissions.

D. The subcontractor is required to understand and coordinate with the work of all other trades in the development of the 3D model. The subcontractor shall check and provide quality control over the work of their detailers, preferably by a foreman, so that their 3D model accurately represent the design intent as it will be exactly installed in the field to operate properly in a fully-integrated system that meets all building codes and the requirements of other jurisdictions and local agencies over this project (Fire Marshall, ADA,). Any deviation during installation should be notified by the trade responsible and approved by the Contractor and the Architect of Record.

E. If the Contractor or subcontractor lacks the in-house modeling, hardware and/or software to accurately generate the 3D Model, it may outsource this modeling effort to a 3rd party. Any 3rd party information should be included in the BIM Execution Plan.

F. It is recommended that the geometry from the BIM should be exported to total station or equal for an accurate, coordinated construction layout. This will increase efficiency in the layout of systems, reduce overall margin of error and ultimately preserve design intent during construction.

G. Project Drawings and required for construction will be extracted from this model. The final "As-built" model is what will be integrated to the District's facilities management programs.

H. Background creation for coordination must be produced by the trade that is in need of another trades background. This can be done by downloading said Revit model and exporting the necessary backgrounds or through model links.

12. Model Authors

1. Their internal modeling process for each trade is not described in the scope of this manual, but the collaboration process is as follows:
2. Contractor assigns action items to project team members during the subcontractor clash resolution meetings, and the viewpoints are sent to the relevant Model Author. PDF pen markups are also useful. A coordination meeting is held with the BIM Construction Team members in the days following, where the issues are viewed and resolved.
3. The Model Authors shall arrive at the meeting with an idea of how each of their clashes can be resolved. Each clash is discussed collaboratively, and action items are assigned and recorded.
4. The Model Author (or subcontractor(s) if assigned) makes the changes to their model and back checks against any newly-discovered clashes caused by this work or other changes that may be concurrent.
5. The model file is posted (Collaborated) to BIM 360 Collaborate daily and clashed daily.
6. BIM 360 Collaborate will automatically update the facilitated model with the model and it is the responsibility of the model author to review their model against the facilitated model for new or resolved clashes.
7. Responsible for providing the required information of all access requests of the model for BIM 360 Collaborate.

13. Data Management

1. Purpose

13.1.1. The objective of the data management guidelines is to establish the framework for the successful capture and management of normalized facility data in order to ensure an efficient migration into systems used for facilities management (FM).

13.1.2. As-builts are accurate and available in a file format that can support change management.

13.1.3. Data is properly normalized (no redundancies) to ensure efficient transition at handover to facility management.

2. Key Software Applications

13.2.1. BIM Applications (Revit 2018, BIM 360 Collaborate, Navisworks)

13.2.2. Construction coordination software (Navisworks, BIM360 Collaborate)

13.2.3. Project Management software (Procore see section 01 31 80)

3. A project designated as a “BIM Project” typically includes deliverables produced both in BIM and non-BIM Applications. For example, the architectural model may be produced in Revit, while mechanical and electrical models are produced in CAD based software. It is critical to set up proper data management procedures before the project is started to enable appropriate data collection and exchange regardless of how many applications are being used by the project delivery team.

4. The Construction BIM Team (including trades) will perform continuous collecting, entering, validating, updating and exporting design, construction data from/into BIM and other data sources. The BIM Construction Team should focus on how they will apply the following objectives of the data management process to ensure process efficiencies.

13.4.1. Capture data as it is created - eliminate redundant data collection efforts where possible;

13.4.2. Implement objective measure for quality control-provide transparent methods to review progress against deliverable requirements

5. The Process Data Management overview starts with the District providing a set of standard naming conventions for equipment, space designation/ zone naming policies, and a minimum set of required attributes for equipment, systems and zones. The BIM Construction Team uses the provided standards from the beginning to avoid renaming BIM objects or searching for missing attributes later in the project. It is required that the BIM Construction Team uses BIM applications for data assignments (not CAD) for all disciplines due to the data-oriented nature of BIM applications.

6. The Contractor sets up one or more milestones during construction to check data for accuracy. The required information to be checked at those milestones will be provided by the BIM Construction Team in advance. The District and Architect of Record reviews the provided models for data accuracy. If there are issues with the data, the model is returned to the BIM Construction Team for corrections.

7. When the Contractor reports that the BIM is ready for construction and the model matches the requirements, it is submitted to the Architect of Record. The Construction BIM Team uses the Construction Model to create shop drawings. The Construction BIM Team can use the design model for reference but does not have to rely on it, except for maintain the naming conventions and space assignments for objects. For example, if there is an object in the BIM with an Instance Name fields value equal to "FSD 25" and its Room Number field is equal to "2311" in the design model, then the construction model should also have an object with an instance Name equal to "FSD 25" and its Room Number equal to "2311", unless the object is moved or deleted. Construction BIM Team will maintain proper naming conventions in their models.

8. Data Management and integration – Additional data related information

13.8.1. For the purposes of using the model for maintenance management, if there are several MEP spaces in the same room (i.e. above ceiling, below floor), those spaces will be classified as one room, unless there is a plenum.

13.8.2. Plenums are defined as a separate space.

13.8.3. Rooms identified in the model, should have Room objects assigned to it.

13.8.4. Room boundaries should be properly connected. All spaces must be bounded by walls and floors. 13.8.5. The MEP model should have spaces mapped to the architectural model and all lifecycle-targeted MEP equipment should be assigned to spaces.

13.8.6. Zones (Revit areas) should be defined and each zone consists of spaces.

13.8.7. Every space has a name and a room number, including the roof if there is rooftop equipment. 13.8.8. All mechanical systems are defined (every element belongs to a system)-I.e. chilled water, hot water, etc.

14. Deliverables

1. The 2D conversion takes place after, or during, the process described in this document. The result of the collaborative, 3D-based construction coordination process is one with input and buy-in from many project participants. Each of the deliverables listed below shall have undergone review by each trade foreman and/or project manager for the following

14.1.1. Conformance with Project Drawings and Specifications.

14.1.2. 2D CAD, PDF, and native Revit (.rvt) files are required

1. Revit files will include the information that will be extracted for future facilities management uses.

2. The final products include:

- 14.2.1. Coordinated P.O.S. (Penetrations, Openings, & Sleeve) drawings which contain locations of any penetrating system through the slab, deck, roof or concrete wall.
- 14.2.2. Coordinated shaft drawings which contain dimensions of all deck openings as well as locations of all systems and equipment located with a shaft including supports and insulation.
- 14.2.3. Coordinated insert and point load drawings
- 14.2.4. Coordinated priority wall drawings
- 14.2.5. Coordinated equipment pad and layout drawings
- 14.2.6. Coordinated composite reflected ceiling plan which accurately shows all ceiling mounted devices and equipment.
- 14.2.7. Coordinated shop drawings
- 14.2.8. Reviewed and approved by the Architect of Record.
- 14.2.9. Coordinated native 3D models for construction fabrication and field installation.
- 14.2.10. Models of the project and set of drawings in PDF format showing locations of all concealed conditions, and the actual dimensions of all architectural, structural, mechanical, electrical, plumbing, security and fire protections elements, components, and systems.
- 14.2.11 Delivery of a model that locates construction elements to a reasonable proximity. Changes made during construction of more than a few inches from the design should be reflected in the model.
- 14.2.12 Tolerances of model. Models are to be accurate to +/-1" of Actual Size and Location for all concealed/hidden components

15. Model Maintenance

1. Each construction model author is responsible for maintaining their models through the construction coordination phase. For example: when RFI's and Change Orders are issued impacting the location of walls and ceilings an updated construction model should be issued. RFI's and changes impacting Finishes would not be issued as a model file. Any RFI's and Change Orders affecting subcontractors require the model authors to update. All as built changes are also required to be updated.
2. Model maintenance also includes data filing for the Team. The guidelines for uploading files must be followed in order to prevent re-filing and to ensure archiving is preserved.
3. During the coordination periods, all participant of this process should make best efforts to keep their models up to date with all changes. These latest models will be distributed to the MEP/FP, Exterior Envelope, drywall subcontractors on a weekly basis unless more frequent updates are needed.

16. Construction and the Model

1. Through the Construction Coordination phase, the BIM Construction Team has determined the most effective scopes of the project to be modeled and the level of detail therein. All systems are fully coordinated as agreed to by the BIM Construction Team. When this detailed preplanning translates into the physical construction, any arising issues are resolved by using the model in the field. However, when discrepancies exist between the 2D and the model, 2D documents take precedence with consideration of the approved federated model. In the physical construction, any arising issues are resolved by using the model in the field.
2. Once an area, floor, or the entire project has been modeled and coordinated, the BIM Leader will publish a Protected Navisworks file (.NWD) and distribute to the BIM Construction Team. Each BIM team member will also plot their drawings for "sign-off" by all trades. By the act of signature and submittal, each subcontractor acknowledges their coordinated portion of the work for installation with all other trades, not limited to

mechanical, electrical, architectural, and structural, fire protection and framing contractors. The Navisworks (protected file) will take precedence over the 2D sign-off drawings when clashes occur and there is a dispute over the accuracy of signed drawings to the 3D Model. Contractor will use these documents to resolve field conflicts that may occur.

3. Contractor shall take responsibility for any and all coordination drawings created by subcontractors for backgrounds, elevations, dimensions, routing paths, sizes, and service access areas⁴. BIM to field tolerance's

16.4.1. All elements are to be installed per the coordinated BIM. This is typically achieved through the use of point layout, prefabrication, layout drawings, and inserts. It is expected that there may still be deviation from these methods. This will be a maximum tolerance of +/- 2".

16.4.2. For all items that are not able to be installed through the use of these methods, there are specific tolerances required. With reference to a model, those items are categorized below:

1. If an item cannot be installed per the above expectation, they are subject to the following tolerances: A. LOD 500 will be a maximum tolerance of +/- 6" B. LOD 450 will be a maximum tolerance of +/- 12" C. LOD 400 and below will have a maximum tolerance of +/- 24"

2. Concealed items within a wall or chase will have a maximum tolerance of +/- 6". Those systems are:

A. Gas

B. Plumbing

C. Hydronic

3. The Point of Connection to and LOD 500 equipment, would adopt the LOD 500 requirement. This adopted LOD ends at the Point of Connection and does not apply to the entire system. A. Receptacles are not considered a Point of Connection.

16.4.3. The model will be used as a tool to assist in the resolution of any conflict created in the field. All items not modeled are to be coordinated around the model.

17. Conforming vs. Non-Conforming Work:

1. Any work performed or installed that differs from the Construction BIM and/or Construction Documents shall be considered Non-Conforming Work.

2. Any work performed or installed that is not modeled and/or coordinated as previously agreed with the contractor will be considered Non-Conforming Work.

3. No work including work based on Change Orders will be performed without the completed 3D model and signed coordination shop drawings, any such work will be considered Non-Conforming Work.

4. Non-Conforming Work includes any and all seismic and anchorage points not shown on signed coordination drawings.

5. Conforming Work is work that has been modeled and clearly shown on signed shop drawings with proper elevations, dimensions, routing paths, service access areas and has been fully coordinated and signed off by all trades for acceptance.

6. Non-Conforming Work that conflicts with Conforming Work will, therefore, have to be moved by the installing Non-Conforming Work Contractor at no additional cost to the Owner this includes any schedule impacts.

7. In the event that Conforming Work may have to be moved or modified to correct the conflict, the installing contractor with the Non-Conforming Work shall be liable for the cost incurred by those BIM Construction Team members in order to accommodate installation of all Non-Conforming Work.

8. Non-Conforming Work will not have precedent over Conforming Work.

9. In the event that “Conforming Work” conflicts with “Conforming Work”, meaning conflicts missed during the coordination process, trades that are in conflict will have to re-coordinate the conflict either in the field or by 3D modeling and Navisworks. At no time will this re-coordination, re-work installation, or schedule impacts become a cost to the Owner.

10. Any work shall be considered ‘Non-conforming’ if the trade has not modeled per specific plan details as required even though what is modeled may be clash free as this will show up as potential conflicts or access issues during construction.

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**SECTION 00 55 00
NOTICE TO PROCEED**

Date:

To:

Address:

PROJECT: COMMUNITY STADIUM UPGRADE PROJECT

You are hereby notified to commence work in accordance with the Contract dated _____, 20__, on or before _____, 20__, and you shall complete the work in accordance with Section 00 52 00, Construction Agreement Form. The date of Substantial Completion is xx/xx/202x, and the date for Final Completion is xx/xx/202x..

Redwoods Community College District

By: _____
Authorized District Signature

END OF SECTION 00 55 00

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**SECTION 00 61 13
PERFORMANCE BOND
(CALIFORNIA PUBLIC WORK)**

WHEREAS, the Governing Board of the Redwoods Community College District (“District”), at its meeting on _____, 20___, has awarded to _____ (“Principal”), the Contract for performance of the following project (“Project”): COMMUNITY STADIUM UPGRADE PROJECT

WHEREAS, the work to be performed by the Contractor is more particularly set forth in that certain contract for said Public Work dated _____, (hereinafter referred to as the “Contract”), which Contract is incorporated herein by this reference; and

WHEREAS, the Principal is required under the terms of the Contract to furnish a bond to the District as obligee ensuring its full and faithful performance of the Contract Documents, which are fully incorporated herein by this reference,

NOW, THEREFORE, we, the Principal and _____, as Surety, hereby guarantee the Principal’s full, faithful and complete performance of the Contract Document requirements in the penal sum of _____ dollars (\$_____) for the payment of which sum will and truly be made, we bind ourselves, our heirs, executors, administrators and successors, jointly, severally, and firmly by this agreement to perform or have performed all of the work and activities required to complete the Project pursuant to the Contract Documents and to pay to the District all damages the District incurs as a result of the Principal’s failure to fully perform in accordance with the Contract Documents.

THE CONDITION OF THE OBLIGATION IS SUCH THAT if the Principal, its heirs, executors, administrators, successors or assigns shall in all things abide by, and well and truly keep and perform the covenants, conditions and agreements in the Contract Documents and any amendment thereof made as therein provided, on its or their parts to be kept and performed at the time and in the manner therein specified, and in all respects according to their true intent and meaning, and shall insure and indemnify and save harmless the District, its officers and agents, as therein stipulated, then this obligation shall become null and void. Otherwise, it shall be and remain in full force and effect.

The Surety, for value received, hereby stipulates and agrees that it shall not be exonerated or released from the obligation of this bond (either by total exoneration or pro tanto) by any change, extension of time, alteration in or addition to the terms of the contract or to the work to be performed there under or the specifications accompanying the same, nor by any change or modification to any terms of payment or extension of time for any payment pertaining or relating to any scheme of work of improvement under the contract. Surety also stipulates and agrees that it shall not be exonerated or released from the obligation of this bond (either by total exoneration or pro tanto) by any overpayment or underpayment by the Obligee that is based upon estimates approved by the Architect. The Surety stipulates and agrees that none of the aforementioned changes, modifications, alterations, additions, extension of time or actions shall in any way affect its obligation on this bond, and it does hereby waive notice of any such changes, modifications, alterations, additions or extension of time to the terms of the contract, or to the work, or the specifications as well notice of any other actions that result in the foregoing.

Whenever Principal shall be, and is declared by the Obligee to be, in default under the Contract, the Surety shall promptly either remedy the default, or shall promptly complete the Contract through its agents or independent contractors, subject to acceptance and approval of such agents or independent contractors by Obligee as hereinafter set forth, in accordance with its terms and conditions and to pay and perform all obligations of Principal under the Contract, including, without limitation, all obligations with respect to warranties, guarantees and the payment of liquidated damages; or, at Obligee’s sole discretion and election, Surety shall obtain a bid or bids for completing the Contract in accordance with its terms and conditions, and upon determination by Obligee of the lowest responsible bidder, arrange for a contract between such bidder and the Obligee and make available as Work progresses (even though there should be a default or succession of defaults under the contract or contracts of completion arranged under this paragraph) sufficient funds to pay the cost of completion less the “balance of the Contract price” (as hereinafter defined), and to pay and perform all obligations of Principal under the Contract, including, without limitation, all obligations with respect to warranties, guarantees and the payment of liquidated damages. The term “balance of the Contract price,” as used in this paragraph, shall mean the total amount payable to Principal by the Obligee under the Contract and any modifications thereto, less the amount previously paid by the Obligee to the Principal, less any withholdings by the Obligee allowed under the Contract.

Surety expressly agrees that the Obligee may reject any agent or contractor which may be proposed by Surety in fulfillment of its obligations in the event of default by the Principal. Unless otherwise agreed by Obligee, in its sole discretion, Surety shall not utilize Principal in completing the Contract nor shall Surety accept a bid from Principal for completion of the work in the event of default by the Principal.

No final settlement between the Obligee and the Contractor shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

The Contractor and Surety shall remain responsible and liable for all patent and latent defects that arise out of or are related to the Contractor’s failure and/or inability to properly complete the Public Work as required by the Contract and the Contract Documents. The obligation of the Surety hereunder shall continue so long as any obligation of the Contractor remains.

Contractor and Surety agree that if the Obligee is required to engage the services of an attorney in connection with enforcement of the bond, Contractor and Surety shall pay Obligee’s reasonable attorneys’ fees incurred, with or without suit, in addition to the above sum.

In the event suit is brought upon this bond by the Obligee and judgment is recovered, the Surety shall pay all costs incurred by the Obligee in such suit, including reasonable attorneys’ fees to be fixed by the Court.

In witness whereof, this instrument has been duly executed by the Principal and Surety on the _____ day of _____, 20____.

PRINCIPAL/CONTRACTOR:

By: _____

SURETY:

By: _____

Attorney-in-Fact

The rate of premium on this bond is _____ per thousand.

The total amount of premium charged: \$ _____ (This must be filled in by a corporate surety).

PAYMENT BOND

WHEREAS, the Redwoods Community College District (“District”) and the Contractor, _____ (“Principal”) have entered into a contract (“Contract”) for the furnishing of all materials, labor, services, equipment, tools, supervision and transportation necessary, convenient and proper for the COMMUNITY STADIUM UPGRADE project (“Project”) which Contract dated _____, 2____, and all of the Contract Documents made part thereof are fully Incorporated herein by this reference; and

WHEREAS, Contractor/Principal is required by Division 4, Part 6, Title 3, Chapter 5 (commencing at Section 9550) of the California Civil Code to furnish a bond in connection with the contract;

NOW, THEREFORE, we, the Contractor/Principal and _____ a corporation organized and existing under the laws of the State of _____, and duly authorized to transact business under the laws of the State of California as Surety, are held firmly bound unto Redwoods Community College District (“Owner”) and to any and all persons, companies, or corporations entitled by law to file stop notices under California Civil Code Section 9100, or any person, company, or corporation entitled to make a claim on this bond in the penal sum of \$_____ Dollars (\$_____), said sum being not less than one hundred percent (100%) of the total amount payable by said Obligee under the terms of said Contract, for which payment will and truly to be made, lawful money of the United States of America for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH that if the Contractor/Principal, his/her or its heirs, executors, administrators, successors, or assigns, or a subcontractor, shall fail to pay any person or persons named in Civil Code Section 9100 or fail to pay for any materials or other supplies used in, upon, for, or about the performance of the work contracted to be done, or for any work or labor thereon of any kind, or for amounts due under the Unemployment Insurance Code with respect to work or labor thereon of any kind, or shall fail to deduct, withhold, and pay over to the Employment Development Department any amounts required to be deducted, withheld, and paid over by Section 13020 of the Unemployment Insurance Code with respect to work and labor thereon of any kind, then said Surety will pay for the same, in or to an amount not exceeding the amount set forth above, and in case suit is brought upon this bond Surety will also pay such reasonable attorney’s fees as shall be fixed by the court, awarded and taxed as provided in Division 4, Part 6, Title 3, Chapter 5 (commencing at Section 9550) of the California Civil Code.

This bond shall inure to the benefit of any of the persons named in Section 9100 of the California Civil Code so as to give a right of action to such person or their assigns in any suit brought upon this bond.

It is further stipulated and agreed that the Surety of this bond shall not be exonerated or released from the obligation of the bond by any change, extension of time for performance, addition, alteration, or modification in, to, or of any contract, plans, specifications, or agreement pertaining or relating to any scheme or work of improvement described above or pertaining or relating to the furnishing of labor, materials, or equipment therefor, nor by any change or modification of any terms of payment or extension of the time for any payment pertaining or relating to any scheme or work of improvement described above, nor by any rescission or attempted rescission of the contract, agreement, or bond, nor by any conditions precedent or subsequent in the bond attempting to limit the right of recovery of claimants otherwise entitled

to recover under any such contract or agreement or under the bond, nor by any fraud practiced by any person other than the claimant seeking to recover on the bond, and that this bond be construed most strongly against the Surety and in favor of all persons for whose benefit such bond is given, and under no circumstances shall Surety be released from liability to those for whose benefit such bond has been given, by reason of any breach of contract between the Owner and original contractor or on the part of any obligee named in such bond, but the sole conditions of recovery shall be that claimant is a person described in Section 8400 and 8402 of the California Civil Code and has not been paid the full amount of his/her or its claim and that Surety does hereby waive notice of any such change, extension of time, addition, alteration, or modification.

In witness whereof, this instrument has been duly executed by the Principal and Surety this _____ day of _____, 20__.

PRINCIPAL/CONTRACTOR:

By: _____

SURETY:

By: _____

Attorney-in-Fact

IMPORTANT: THIS IS A REQUIRED FORM.

Surety companies executing bonds must possess a certificate of authority from the California Insurance Commissioner authorizing them to write surety insurance defined in California Insurance Code Section 105, and if the work or project is financed, in whole or in part, with federal, grant or loan funds, Surety's name must also appear on the Treasury Department's most current list (Circular 570 as amended).

Any claims under this bond may be addressed to:

(Name and Address of Surety)

(Name and Address of agent or representative for service for service of process in California)

Telephone: _____

Telephone: _____

STATE OF CALIFORNIA)

) ss.

COUNTY OF HUMBOLDT)

On _____ before me, _____,
(insert name and title of the officer)

a Notary Public in and for said State, personally appeared _____, who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument as the Attorney-in-Fact of the _____ (Surety) and acknowledged to me that he/she/they subscribed the name of the _____ (Surety) thereto and his own name as Attorney-in-Fact on the executed instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Notary Public in and for said State (SEAL)

Commission expires: _____

NOTE: A copy of the power-of-attorney to local representatives of the bonding company must be attached hereto.

The above bond is accepted and approved this ____ day of _____, 20__.

By: _____

Authorized District Signature

END SECTION 00 61 13

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**Section 00 70 00
CONTRACT**

This Contract ("Contract") is made by and between the Redwoods Community College District ("District"), and _____ ("Contractor").

District and Contractor hereby agree as follows:

1. Description of Work

The Contractor agrees to furnish all labor, materials, equipment, tools, supervision, appurtenances, and services, including transportation and utilities, required to perform and satisfactorily complete all work required for the following project ("Project") in full conformance with the Contract Documents:

2. Contract Documents

The Contract Documents consist of the executed Contract and all Addenda, all approved change orders, the completed Bid Form, the required Bonds and the Insurance forms, the Notice Inviting Bids, the Instructions to Bidders, the Notice of Award, the Notice to Proceed, the General Conditions and any supplemental conditions, the Technical Specifications, the Drawings, the completed Bidder's Questionnaire, and _____

_____.

3. Compensation

As full compensation for the Contractor's complete and satisfactory performance of the work and activities described in the Contract Documents, the District agrees to pay Contractor, and Contractor agrees to accept the sum of _____ Dollars (\$ _____), which shall be paid to the Contractor according to the Contract Documents.

4. Prevailing Wages and Labor Compliance

This Project is subject to prevailing wage requirements and Contractor and its Subcontractors are required to pay all workers employed for the performance of this Contract no less than the applicable prevailing wage rate for each such worker. The project is subject to compliance monitoring and enforcement by the California Department of Industrial Relations. In accordance with SB 854, all bidders, contractors and subcontractors working at the site shall be duly registered with the Department of Industrial Relations at time of bid opening and at all relevant times. Proof of registration shall be provided as to all such contractors prior to the commencement of any work.

5. Time for Completion

The starting date of the Contract shall be the day listed by the District in the Notice to Proceed and the Contractor shall fully complete all the work before the expiration of _____ calendar days from the starting date. Time is of the essence in the performance of this Contract.

6. Liquidated Damages

Liquidated damages for the Contractor's failure to complete the Contract within the time fixed for completion are established in the amount of \$_____ per calendar day.

IN WITNESS WHEREOF, the parties agree to the terms of this Contract on the day and year written below.

District

Contractor

Resolution No. _____

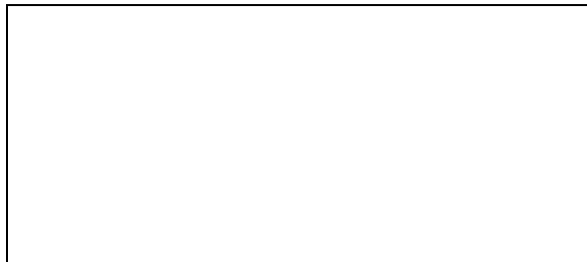
Contractor License No.
and Expiration Date

Date

By: _____
Individual Signature

Title

Date



For: _____
Corporation or Partnership

If Corporation, Affix Seal.

GENERAL CONDITIONS

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1. DEFINITIONS

Addendum: A written change or revision to the Contract Documents issued to the prospective bidders prior to the time of receiving bids.

Alternate: The sum to be added to or deducted from the base Bid if the change in scope of work as described in Alternates is accepted by the District.

Approved: Approved by the District or the District's authorized representative unless otherwise indicated in the Contract Documents.

Architect: The person or firm holding a valid license to practice architecture or engineering which has been designated (if any designated) to provide architectural or engineering design services on this Project. When Architect is referred to within the Contract Documents and no architect or engineer has in fact been designated, then the matter shall be referred to the District Superintendent or designee.

As Directed: As directed by the District or its Architect, unless otherwise indicated in the Contract Documents.

As Selected: As selected by the District or its Architect, unless otherwise indicated in the Contract Documents.

Bid: The properly completed and signed proposal to perform the construction work for the Project as described in the Contract Documents.

Construction Manager: The individual or entity named as such by the District. If no Construction Manager is designated for the Project, all references to the Construction Manager in these Contract Documents shall mean the District and/or its designee.

Contract: The legally binding agreement between the District and the Contractor wherein the Contractor agrees to furnish the labor, materials, equipment, and appurtenances required to perform the work described in the Contract Documents and the District agrees to pay the Contractor for such work.

Contract Documents: The Contract Documents are described in the Contract for this Project.

Contractor: The person or entity holding a valid license in the State of California required for performing this Project and who has contracted with the District to perform the construction work described in the Contract Documents. The term Contractor shall be construed to mean all of the officers, employees, Subcontractors, suppliers, or other persons engaged by the Contractor for the work of this Project.

District and/or Owner: The District, its Governing Board, authorized officers and employees, and authorized representatives.

DSA: The State of California Division of the State Architect which has the authority to review, approve and inspect the design, alteration and construction of school buildings.

Final Completion: Final Completion is achieved when the Contractor has fully completed all Contract Document requirements, including, but not limited to, all final punch list items, to the District's satisfaction.

Inspector: The person engaged by the District to conduct the inspections required by the Education Code and Title 24.

Furnish: Purchase and deliver to the site of installation.

Governing Board: The Governing Board of the District.

Indicated or As Shown: Shown on drawings and/or as specified.

Install: Fix in place, for materials; and fix in place and connect, for equipment.

Modification: An authorized change to the Contract Documents which may or may not include a change in contract price and/or time.

Project: The total construction work and activities described in these Contract Documents.

Secure: Obtain.

Subcontractor: A person, firm, or corporation, duly licensed by the State of California, who has a contract with the Contractor to furnish labor, materials and equipment, and/or to install materials and equipment for work in this Contract.

2. ARCHITECT

The Architect is responsible for the overall design of the Project. The working drawings, technical Specifications, sketches and other information necessary to define the work covered by these Contract Documents have been prepared by the Architect. The Architect shall visit, inspect and observe the construction to determine general compliance with the Contract Documents, and interpret the drawings and Specifications consistent with their intent. The Architect shall evaluate the samples and other submittals required in the technical Specifications, and maintain an up-to-date log of all such items processed. The Architect will consult with the District, Contractor, and any state, county or city agency having jurisdiction over the work whenever necessary to further the best interests of the Project.

3. CONTRACT DOCUMENTS

a. Contents and Precedence

The Contract Documents consist of the executed Contract and all Addenda, all approved change orders, the completed Bid Form, the required Bonds and the Insurance forms, the Notice Inviting Bids, the Instructions to Bidders, the Notice of Award, the Notice to Proceed, the General Conditions, any supplemental Conditions, the Technical Specifications, the Drawings and the completed Bidder's Questionnaire. The Contract Documents are complementary and anything required by one shall be as binding as if required by all. In case of conflicts within the Contract Documents, the order of precedence of interpretation shall be as listed above, with the executed Contract and any change order thereto having priority, and subsequent Addenda having priority over prior Addenda only to the extent modified by the subsequent Addenda. In case of conflict within the drawings, larger scale drawings shall govern smaller scale drawings, and written dimensions shall govern over scaled dimensions.

b. Ambiguities, Errors, and Inconsistencies

If, in the opinion of the Contractor, the construction details indicated on the drawings or otherwise specified are in conflict with accepted industry standards for quality construction and therefore might interfere with its full guarantee of the work involved, the Contractor shall promptly bring this information to the attention of the Architect for appropriate action before submittal of the bid. Contractor's failure to request clarification or interpretation of an apparent ambiguity, error or inconsistency waives that Contractor's right to thereafter claim any entitlement to additional compensation based upon an ambiguity, inconsistency, or error, which should have been discovered by a reasonably prudent Contractor, subject to the limitations of Public Contract Code §1104. During the Project, should any discrepancy appear or any misunderstanding arise as to the import of anything contained in the Contract Documents, the matter shall be promptly referred to the Architect, who will issue instructions or corrections.

c. Lines and Planes

All lines and planes appearing on Contract drawings to be horizontal or vertical and not explicitly indicated otherwise shall be constructed true and plumb. All lines and planes appearing on Contract drawings to intersect at right angles and not explicitly indicated otherwise shall be constructed at true right angles. Where details are indicated covering specific conditions, such details also apply to all similar conditions not specifically indicated.

d. Standards

The specification standards of the various sections of the Specifications shall be the procedural, performance, and material standards of the applicable association publications identified and shall be the required level of installation, materials, workmanship, and performance for the applicable work. Except where a specific date of issue is mentioned hereinafter, references to specification standards shall mean the edition, including amendments and supplements, in effect on the date of the Notice Inviting Bids. Where no standard is identified and a manufacturer is specified, the manufacturer's specifications are

the standards. All standards shall be subordinate to the requirements of the applicable codes and regulations.

e. Reference to the Singular

Wherever in the Specifications an article, device or piece of equipment is referred to in the singular number, such reference shall include as many such items as are shown on drawings or required to complete the installation.

4. INTENT OF DRAWINGS AND SPECIFICATIONS

- a. Drawings and Specifications are to be read as an integrated document. The Contractor shall promptly report to the Architect any ambiguities, discrepancies, or errors which come to the Contractor's attention.
- b. Figured dimensions shall be followed in preference to scaled dimensions, and the Contractor shall make all additional measurements necessary for the work and shall be responsible for their accuracy. Before ordering any material or doing any work, the Contractor shall verify all measurements at the Project site and shall be responsible for the correctness of same.
- c. It is the intent of the drawings and Specifications to show and describe complete installations. Items shown but not specified, or specified but not shown, shall be included unless specifically omitted.
 - 1) The Specifications shall be deemed to include and require everything necessary and reasonably incidental to the completion of all work described and indicated on the drawings, whether particularly mentioned or shown, or not.

5. TRADE DIVISIONS

Segregation of the Specifications into the designated trade divisions is only for the purpose of facilitating descriptions and shall not be considered as limiting the work of any subcontract or trade. Subject to other necessary provisions set forth in the Specifications, the terms and conditions of such limitations or inclusions shall lie solely between the Contractor and its Subcontractors. "Scope" as indicated in each section of the Specifications shall serve only as a general guide to what is included in that section. Neither the stated description nor the division of the plans and Specifications to various sections, which is done solely for convenience, shall be deemed to limit the work required, divide or indicate it by labor jurisdiction or trade practice, or set up any bidding barriers to the various sub-contractors or suppliers.

- a. The Contractor shall be responsible for the proper execution of all work required by the Contract Documents and for allocating such portions as the Contractor sees fit to the various Subcontractors, subject to applicable law. The Contractor is cautioned that the various individual sections may not contain all work that the Contractor may wish to allocate to a particular Subcontractor or everything bearing on the work of a particular trade, some of which may appear in other portions of the plans or Specifications.

- b. If the Contractor elects to enter into any subcontract for any section of the work the Contractor assumes all responsibility for ascertaining that the Subcontractor for the work is competent, licensed, solvent, thoroughly acquainted with all conditions and legal requirements of the work, has included all materials and appurtenances in connection therewith in the subcontract, and has performed its work in strict compliance with the Contract Documents.
- c. It shall be the responsibility of the Contractor to notify each prospective Subcontractor at the time of request for bids of all portions of the Contract Documents, including the General Conditions, Supplementary Conditions and any parts of sections of Specifications or plans that the Contractor intends to include as part of the subcontract.

6. MASTER MANDATORY PROVISIONS

- a. Any material, item, or piece of equipment mentioned, listed or indicated without definition of quality, shall be consistent with the quality of adjacent or related materials, items, or pieces of equipment on the Project.
- b. Any method of installation, finish, or workmanship of an operation called for, without definition of standard of workmanship, shall be followed or performed and finished in accordance with best practices and consistent with adjacent or related installations on the Project.
- c. Any necessary material, item, piece of equipment or operation not called for but reasonably implied as necessary for proper completion of the work shall be furnished, installed or performed and finished; and shall be consistent with adjacent or related materials, items, or pieces of equipment on the Project, and in accordance with best practices.
- d. Names or numbered products are to be used according to the manufacturers' directions or recommendations unless otherwise specified.

7. CONTRACTOR

- a. The Contractor shall perform all the work and activities required by the Contract Documents and furnish all labor, materials, equipment, tools and appurtenances necessary to perform the work and complete it to the District's satisfaction within the time specified. The Contractor shall at all times perform the work of this Contract in a competent and workmanlike manner and, if not specifically stated, accomplish the work according to the best standards of construction practice. The Contractor in no way is relieved of any responsibility by the activities of the architect, engineer, inspector or DSA in the performance of such duties.
- b. The Contractor shall employ a full-time competent superintendent and necessary assistants who shall have complete authority to act for the Contractor on all matters pertaining to the work. The superintendent shall be satisfactory to the District and, if not satisfactory, shall

be replaced by the Contractor with one that is acceptable. Also, the superintendent shall not be changed without the written consent of the District unless the superintendent ceases to be employed by the Contractor.

- c. Contractor shall make the layout of lines and elevations and shall be responsible for the accuracy of both the Contractor's and the Subcontractors' work resulting therefrom. All dimensions affecting proper fabrication and installation of all Contract work must be verified by the Contractor prior to fabrication and installation by taking field measurements of the true conditions. The Contractor shall take, and assist Subcontractors in taking, all field dimensions required in performance of the work, and shall verify all dimensions and conditions on the site. If there are any discrepancies between dimensions in drawings and existing conditions which will affect the work, the Contractor shall promptly bring such discrepancies to the attention of the Architect for adjustment before proceeding with the work. Contractor shall be responsible for the proper fitting of all work and for the coordination of all trades, Subcontractors and persons engaged upon this Contract.
- d. Contractor shall do all cutting, fitting, or patching of Contractor's work that may be required to make its several parts come together properly and fit it to receive or be received by work of other contractors as shown, or reasonably implied by, the drawings and Specifications for the completed work. Any cost incurred by the District due to defective or ill-timed work shall be borne by the Contractor.

8. RESPONSIBILITY OF CONTRACTOR

- a. Contractor shall be held strictly responsible for the proper performance of all work covered by the Contract Documents, including all work performed by Subcontractors. All work performed under this Contract shall comply in every respect to the rules and regulations of all agencies having jurisdiction over the Project or any part thereof.
- b. Contractor shall submit Verified Reports as defined in §§4-336 and 4-343 (c), Group 1, Chapter 4, Part I, Title 24, California Code of Regulations ("CCR"). The duties of the Contractor are as defined in §4-343, Group 1, Chapter 4, Part I, Title 24, of the CCR. Contractor shall keep and make available a copy of Title 24 of the CCR at the job site at all times.
- c. Where, because of short supply, any item of fabricated materials and/or equipment, indicated on drawings or specified is unobtainable and it becomes necessary, with the consent of the Architect, to substitute equivalent items differing in details or design, the Contractor shall promptly submit complete drawings and details indicating the necessary modifications of the work. This provision shall be governed by the terms of the General Conditions regarding Submittals: Shop Drawings, Cuts and Samples.
- d. With respect to work performed at and near a school site, Contractor shall at all times take all appropriate measures to ensure the security and safety of students and staff, including, but not limited to, ensuring that all of Contractor's employees, Subcontractors,

and suppliers entering school property strictly adhere to all applicable District policies and procedures, e.g., sign-in requirements, visitor badges, and access limitations.

9. SUBCONTRACTORS

- a. Nothing contained in the Contract Documents shall create any contractual relationship between any Subcontractor and the District. The District shall be deemed to be the third party beneficiary of the contract between the Contractor and each Subcontractor. If the Contractor does not specify a Subcontractor for any portion of the work to be performed under this Contract, as required by law, Contractor shall perform that portion of the work with its own forces. The Contractor shall not substitute any other person or firm as a Subcontractor for those listed in the bid submitted by the Contractor, without the written approval of the District and in conformance with the requirements of the Public Contract Code. The District reserves the right of approval of all Subcontractors proposed for use on this Project, and to this end, may require financial, performance, and such additional information as is needed to secure this approval. If a Subcontractor is not approved, the Contractor shall promptly submit another firm of the same trade for approval.
- b. The Contractor shall insert appropriate provisions in all subcontracts pertaining to work on this Project requiring the Subcontractors to be bound by all applicable terms of the Contract Documents. The Contractor shall be as fully responsible for the acts and omissions of the Subcontractors, and of persons either directly or indirectly employed by them, as the Contractor is for the acts and omissions of persons directly employed by the Contractor.

10. PERFORMANCE AND PAYMENT BONDS

- a. As directed in the Notice of Award, the Contractor shall file with the District the following bonds, using the bond forms provided with these Contract Documents:
 - 1) A corporate surety bond, in a sum not less than 100 percent of the amount of the Contract, to guarantee the faithful performance of the Contract.
 - 2) A corporate surety bond, in a sum not less than 100 percent of the amount of the Contract, to guarantee the payment of wages for services engaged and of bills contracted for materials, supplies, and equipment used in the performance of the Contract.
- b. Corporate sureties on these bonds and on bonds accompanying bids must be admitted sureties as defined by law, legally authorized to engage in the business of furnishing surety bonds in the State of California. All sureties and bond forms must be satisfactory to the District. Failure to submit the required bonds within the time specified by the Notice of Award, using the forms provided by the District, may result in cancellation of the award of Contract and forfeiture of the Bid Bond.
- c. The amount of the Contract, as used to determine the amounts of the bonds, shall be the total amount fixed in the Contractor's proposal for the performance of the required work.

- d. During the period covered by the Contract, if any of the sureties upon the bonds shall become insolvent or unable, in the opinion of the District, to pay promptly the amount of such bonds to the extent to which surety might be liable, the Contractor, within thirty (30) days after notice given by the District to the Contractor, shall provide supplemental bonds or otherwise substitute another and sufficient surety approved by the District in place of the surety becoming insolvent or unable to pay. If the Contractor fails within such thirty (30) day period to substitute another and sufficient surety, the Contractor shall, if the District so elects, be deemed to be in default in the performance of its obligations hereunder and upon the bid bond, and the District, in addition to any and all other remedies, may terminate the Contract or bring any proper suit or other proceedings against the Contractor and the sureties or any of them, or may deduct from any monies then due or which thereafter may become due to the Contractor under the Contract, the amount for which the surety, insolvent or unable to pay, shall have been liable on the bonds, and the monies so deducted shall be held by the District as collateral security for the performance of the conditions of the bonds.

11. INSURANCE

- a. Contractor shall obtain insurance from a company or companies acceptable to District. All required insurance must be written by an admitted company licensed to do business in the State of California at the time the policy is issued. All required insurance shall be equal to or exceed an A VIII rating as listed in Best's Insurance Guide's latest edition. Required documentation of such insurance shall be furnished to the District at the time Contractor returns the executed Contract. Contractor shall not commence work nor shall it allow its employees or Subcontractors or anyone to commence work until all insurance required hereunder has been submitted and approved by the District and a notice to proceed has been issued.
- b. Contractor shall take out and maintain at all times during the life of this Contract, up to the date of acceptance of the work by the District, the following policies of insurance:
 - 1) General Liability Insurance: Personal injury and replacement value property damage insurance for all activities of the Contractor and its Subcontractors arising out of or in connection with this Contract, written on a comprehensive general liability form including contractor's protected coverage, blanket contractual, completed operations, vehicle coverage and employer's non-ownership liability coverage, in an amount no less than either:
 - a. \$__,000,000.00 combined single limit personal injury and property damage for each occurrence and \$__,000,000.00 annual aggregate with a \$___ umbrella/excess; or
 - b. \$__,000,000.00 annual combined single limit.
 - 2) Builders Risk Insurance:

___ Contractor is not required to procure and maintain builders' risk insurance (all-risk coverage).

___ Contractor shall procure and maintain builders' risk insurance (all-risk coverage) on a one hundred percent completed value basis on the insurable portion of the project for the benefit of the District, and the Contractor and subcontractor as their interest may appear.

3) Automobile Liability Insurance: Covering bodily injury and property damage in an amount no less than \$___,000,000 combined single limit for each occurrence. Such insurance shall include coverage for owned, hired, and non-owned vehicles and be included on the umbrella/excess policy.

c. The certificate(s) for the _____ both the General Liability Policy(ies) and the Automobile Liability Policy specified above must state that the insurance is under an occurrence based, and not claims made, policy(ies) and shall be endorsed with the following specific language:

“The _____ District is named as additional insured for all liability arising out of the operations by or on behalf of the named insured, and this policy protects the additional insured, its officers, agents and employees against liability for bodily injuries, deaths or property damage or destruction arising in any respect directly or indirectly in the performance of the Contract.”

d. The certificate(s) for the both the General Liability Policy and the Automobile Liability Policy, as well the Builders' Risk Policy if required above, shall be endorsed with the following specific language:

- 1) The inclusion of more than one insured shall not operate to impair the rights of one insured against another insured and the coverages afforded shall apply as though separate policies have been issued to each insured.
- 2) The insurance provided herein is primary and no insurance held or owned by the District shall be called upon to contribute to a loss.
- 3) Coverage provided by this policy shall not be reduced or canceled without thirty (30) days written notice given to the Owner by certified mail.
- 4) This policy does not exclude explosion, collapse, underground excavation hazard, or removal of lateral support.
- 5) The certificates must state that the insurance is under an occurrence based, and not a claims-made, or "modified occurrence," policy (policies).

e. Within ten (10) days following issuance of the Notice of Award of the Contract, the following documentation of insurance shall be submitted to District for approval prior to

issuance of the Notice to Proceed: Certificates of insurance showing the limits of insurance provided, certified copies of all policies, and signed copies of the specified endorsements for each policy. At the time of making application for an extension of time, the Contractor shall submit evidence that the insurance policies will be in effect during the requested additional period of time.

f. If the Contractor fails to maintain such insurance, the District may take out such insurance to cover any damages of the above mentioned classes for which the District might be held liable on account of the Contractor's failure to pay such damages, and deduct and retain the amount of the premiums from any sums due the Contractor under the Contract.

g. Workers' Compensation Insurance:

- 1) Within ten (10) calendar days following issuance of the Notice of Award of the Contract, the Contractor shall furnish to the District satisfactory proof that the Contractor and all Subcontractors it intends to employ have procured, for the period covered by the Contract, full Workers' Compensation insurance and employer's liability with limits of at least \$1,000,000 with an insurance carrier satisfactory to the District for all persons whom the Contractor may employ in carrying out the work contemplated under this Contract in accordance with the Workers' Compensation Insurance and Safety Act, approved May 26, 1913, and all acts amendatory or supplemental thereto (the "Act"). Such insurance shall be maintained in full force and effect during the period covered by the Contract. In the event the Contractor is self-insured, Contractor shall furnish a Certificate of Permission to Self-Insure, signed by the Department of Industrial Relations Administration of Self-Insurance, Sacramento, California.
- 2) If the Contractor fails to maintain such insurance, the District may take out worker's compensation insurance to cover any compensation which the District might be liable to pay under the provisions of the Act, by reason of any employee of the Contractor being injured or killed, and deduct and retain the amount of the premiums for such insurance from any sums due the Contractor under the Contract, or otherwise recover that amount from the Contractor or the Surety.
- 3) If an injury occurs to any employee of the Contractor for which the employee, or the employee's dependents in the event of the employee's death, is entitled to compensation under the provisions of the Act, or for which compensation is claimed from the District, the District may retain from the sums due the Contractor under this Contract an amount sufficient to cover such compensation, as fixed by the Act, until such compensation is paid, or until it is determined that no compensation is due, and if the District is compelled to pay such compensation, it will deduct and retain from such sums the amount so paid, or otherwise recover this sum from the Contractor or its Surety.
- 4) The policies represented by the certificates shall be endorsed with a Waiver of Subrogation and must contain the provision (and the certificates must so state) that

the insurance cannot be canceled until thirty (30) days after written notice of intended cancellation has been given to the District by certified mail.

12. CODES AND REGULATIONS

- a. The Contractor shall be knowledgeable regarding and shall comply with applicable portions of California Code of Regulations Title 24, the applicable Building Code, and all other codes, ordinances, regulations or orders of properly constituted authority having jurisdiction over the work of this Project. The Contractor shall examine the Contract Documents for compliance with these codes and regulations and shall promptly notify the Architect of any discrepancies.
- b. All work and materials shall be in full accordance with the latest rules and regulations of the Safety Orders of the Division of Industrial Safety and the applicable State laws and/or regulations. Nothing in the Project plans or Specifications is to be construed to permit work not conforming to the applicable Codes. Buildings and/or all other construction covered by this Contract shall meet all the regulations for access by the physically handicapped as administered by the Division of the State Architect and as may be required by federal or state law.
- c. If the work under this Contract is for the construction of a school building as defined by the Education Code, then the following provisions shall apply to the Contract:
 - 1) All work shall be executed in accordance with the current requirements of the Education Code and California Code of Regulations: Title 24 and Title 19. No deviations from the DSA approved plans and Specifications will be permitted except upon a Change Order or Addenda, signed by the District and Architect and approved by the Division of the State Architect and the State Fire Marshal, if applicable.
 - 2) The Division of the State Architect shall be notified 48 hours in advance of the first pour of concrete.

13. PERMITS AND TAXES

- a. The Contractor shall obtain and pay for all permits, fees and licenses that are required in order to perform the work under this Contract. The District shall pay connection charges and meter costs for new permanent utilities required by these Contract Documents. The Contractor shall notify the District sufficiently in advance to submit requests for service to the appropriate utility companies so as to insure connections or installation of utility services in accordance with the Project schedule.
- b. The Contractor shall pay for all taxes on materials and equipment. The District is exempt from Federal Excise Tax. Contractor shall not pay Federal Excise Tax on any item in this Contract.

14. PATENTS AND ROYALTIES

All fees or claims for patents, royalties or licenses on materials, equipment or processes used in the performance of work on this Project shall be included in the amount of the Bid. The Contractor shall indemnify, defend, and hold harmless the District, its Governing Board, the Architect, and their officers and employees, from all claims or liability, including costs and expenses, which may arise from the use on this Project of any patented or copyrighted materials, equipment, or processes.

15. SAFETY AND FIRE PREVENTION

- a. The Contractor, Subcontractors and all of their agents and employees shall fully comply with all of the provisions and requirements of CAL/OSHA, Title 8, California Code of Regulations and all other safety codes applicable to the Project. The Contractor shall take thorough precautions at all times for the protection of persons and property, and shall be liable for all damages to persons or property, either on or off the site, which occur as a result of Contractor's prosecution of the work. The Contractor shall obtain permits for, install and maintain in safe condition barricades, walkways, fences, railings, and whatever other safeguards that may be necessary to protect persons and property from damage as a result of the construction under this Contract.
- b. Contractor is required to ensure Material Safety Data Sheets ("MSDS") are available in a readily accessible place at the work site for any material requiring a MSDS pursuant to the federal "Hazard Communication" standard or employee "right to know" laws. Contractor is also required to ensure proper labeling on materials brought on the job site such that any person working with the material or within the general area of the material is informed of the hazards of the material and follows proper handling and protection procedures. A copy of the MSDS shall also be promptly submitted directly to the District.
- c. Contractor shall not endanger any work by cutting, excavating, or otherwise altering the work and shall not cut or alter the work of any other contractor except with the written consent of the Architect, nor overload any new or existing structures by the placing or storage of materials, equipment, or other items thereon, and, if necessary, shall provide calculations proving the safety in so doing.
- d. If it is necessary to work at night, or where daylight is obscured, the Contractor shall provide and maintain lighting of an adequate level to properly prosecute the work, to permit the thorough inspection of same, and to ensure the safety to workers and others.
- e. Contractor shall take extraordinary care to prevent fires and keep all flammable materials and oily rags in tightly closed metal containers. Contractor shall exercise particular care when welding or cutting, and with regard to the disposition of waste materials, the nature and quantity of which might create or increase a fire hazard.

16. HAZARDOUS MATERIALS

Unless otherwise specified, this Contract does not include the removal, handling, or disturbance of any hazardous substances or materials encountered in the new construction or on the Project

grounds. If such substances or materials are encountered, work shall cease in that area and the District shall be promptly notified to take appropriate action for removal or otherwise abating the condition in accordance with current regulations applicable to the District.

a. General

- 1) No asbestos, asbestos-containing products or other hazardous materials shall be used in this construction or in any tools, devices, clothing or equipment used to further this construction.
- 2) Asbestos and/or asbestos containing products shall be defined as all items containing but not limited to chrysotile, crocidolite, amosite, anthophyllite, tremo-lite or actinolite.
- 3) Any or all material containing greater than one tenth of one percent (>.1%) asbestos shall be defined as asbestos-containing material.
- 4) Any disputes involving the question of whether or not material contains asbestos shall be settled by electron microscopy; the cost of any such tests shall be paid by the Contractor.
- 5) All work or materials found to contain asbestos or work or material installed with asbestos containing equipment will be immediately rejected and this work shall be removed by the Contractor at no additional cost to the District.

b. Decontamination and Removal of hazardous material from prior work

- 1) Decontamination and removal of work found to contain asbestos or work installed with asbestos containing equipment shall be done only under the supervision of a qualified consultant, knowledgeable in the field of asbestos abatement and accredited by the Environmental Protection Agency (“EPA”).
- 2) The asbestos removal contractor shall be an EPA-accredited contractor qualified in the removal of asbestos subject to the approval of the District.
- 3) The asbestos consultant shall be chosen and approved by the District which shall have sole discretion and final determination in this matter.
- 4) The work will not be accepted until asbestos contamination is reduced to levels deemed acceptable by the asbestos consultant.

c. Hold Harmless

- 1) Interface of work under this Contract with work containing asbestos shall be executed by the Contractor at Contractor’s risk and at Contractor’s discretion with full knowledge of the currently accepted standards, hazards, risks and liabilities

associated with asbestos work and asbestos containing products. By execution of this Contract the Contractor acknowledges the above and agrees to hold harmless, as set forth in the indemnity provisions of this Contract, the Owner, its employees, agents and assigns for all asbestos liability which may be associated with this work and agrees to instruct Contractor's employees and agents with respect to the above-mentioned standards, hazards, risks and liabilities.

- 2) The Contractor shall, prior to commencement of this work, provide a duly signed and notarized affidavit that Contractor has instructed Contractor's employees and agents with respect to the above mentioned standards, hazards, risks and liabilities and the contents and requirements of this portion of the Contract Documents.

d. Certification

The Contractor agrees that materials containing asbestos or other hazardous materials as defined in Federal and State law shall not be used in construction.

17. TEMPORARY FACILITIES

- a. The Contractor shall obtain permits for, install and maintain in safe condition all scaffolds, hoisting equipment, barricades, walkways, or other temporary structures that may be required to accomplish the work. Such structures shall be adequate for the intended use and capable of safely accepting all loads that may be imposed upon them. They shall be installed and maintained in accordance with all applicable codes and regulations.
- b. The Contractor shall provide and maintain temporary heat from an approved source whenever in the course of the work it may become necessary for curing, drying or warming spaces as may be required for the proper installation of materials or finishes. The Contractor shall provide and maintain any and all facilities that may be required for dewatering in order that work may proceed on the Project. If it is necessary for dewatering to occur continually, the Contractor shall have on hand whatever spare parts or equipment that may be required to avoid interruption of service or work.
- c. The Contractor shall promptly remove all such temporary facilities when they are no longer needed for the work or on completion of the Project. The Contractor shall repair any damage to premises or property which resulted from the construction, use, or removal of temporary facilities and shall restore the premises and property to their original condition.
- d. See the Supplemental General Conditions and/or specifications for requirements concerning temporary sanitary facilities and utilities.

18. SIGNS

No signs may be displayed on or about the District's property (except those which may be required by law) without the District's prior written approval of size, content and location. Any signs required by the District will be designated in the Supplemental General Conditions.

19. TIME

- a. The Contractor shall commence the work on the date indicated in the Notice to Proceed. Time is of the essence regarding the Contract work, and the Contractor shall prosecute the work diligently and regularly at such a rate of progress as to ensure completion of this Project within, or sooner than, the time specified.
- b. The Contractors and Subcontractors shall investigate and become aware of the amount of time required for the delivery of all equipment and materials required to perform the work under this Contract, and no extension of time shall be granted due to failure to order the equipment and materials sufficiently before their incorporation into the work so as to avoid delay to the Project.
- c. The Contractor and Subcontractors shall provide and maintain enough manpower, materials and equipment to ensure a rate of construction progress that will complete the Project within or sooner than the time specified and according to the schedule of work. If, in the District's opinion, the Contractor and/or Subcontractors are not prosecuting the work at a sufficient rate of progress to meet the Project schedule, the District may direct the Contractor to provide additional manpower, materials or equipment, or to work additional hours, holidays or weekends without additional cost to the District until the work is progressing in a manner satisfactory to the District. Failure to prosecute the work in a timely manner according to the Project schedule is considered a breach of Contract and shall be cause for termination of the Contract.

20. CONSTRUCTION SCHEDULE

- a. Within fifteen (15) calendar days after the award of the Contract, the Contractor shall prepare and submit to the Architect and District an as-planned construction schedule showing in detail how the Contractor plans to prosecute the work within the time set for Final Completion. The schedule shall include the work of all trades necessary for construction of the Project, and shall be sufficiently complete and comprehensive to enable progress to be monitored on a day-by-day basis. The information for each activity shall include at a minimum the activity description, duration, start date and completion date.
- b. The Contractor shall take care in the preparation of the schedule to ensure that it represents an accurate and efficient plan for accomplishing the work. If the Project is more than one week behind schedule, it must be promptly revised showing how the Contractor plans to complete the work, but in no case shall it show a completion date later than that required by the Contract, unless a time extension has been granted. The current schedule shall be kept posted in the Contractor's project office on site.
- c. The Contractor shall be responsible for the coordination of all work necessary and pertaining to the construction whether actually a part of this Contract or attendant thereto. The Contractor shall notify the District and various utility companies, as far as possible in advance of their required work, in order that work schedules may be developed for all

concerned, which will permit the most effective and timely accomplishment of the entire Project.

21. DELAYS AND TIME EXTENSIONS

- a. The Contractor may be granted a time extension if the Contractor encounters an unavoidable delay of the work due to causes completely beyond the Contractor's control and which the Contractor could not have avoided by the exercise of reasonable care, prudence, foresight and diligence. Causes for which a claim for extension of time may be made include: acts of the public enemy, acts of another contractor in the performance of another contract with the District, priority of a governmental agency for materials or equipment, fire, flood, violent wind storm, epidemic, quarantine restriction, strike, freight embargo, or weather of an unusually severe nature. The Contractor will not be granted time extensions for weather conditions which are normal for the location of the Project, according to the U. S. Weather Bureau Records.
- b. A request for extension of time and compensation related thereto shall be made in writing to the Architect and District within ten (10) calendar days of the date the delay is encountered, or shall be deemed waived. The request shall include a detailed description of the reasons for the delay and corrective measures by the Contractor. The request shall be accompanied by evidence that the insurance policies required by the Contract shall be in effect during the requested additional period of time. In order for the Architect to consider a request for time extension, the Contractor must prove that the reasons stated for the delay actually caused a delay in portions of the work which will result in completion beyond the date specified in the Contract. The Contractor may also be granted a time extension for a significant change in the scope of work which request for extension of time shall be included in a Contract modification proposal.
- c. No damages or compensation or any kind shall be paid to a Contractor because of delays in the progress of work, whether such delays be avoidable or unavoidable, that are not the responsibility of District. District's liability to Contractor for delays for which District is responsible shall be limited to an extension of time unless such delays were unreasonable under the circumstances involved and were not within the contemplation of the parties when the Contract was awarded. The Contractor shall provide to the District the actual, substantiated costs to Contractor for which the Contractor may claim damages from District. Such costs, if any, shall be directly related to the Project, and shall not include costs that would be borne by the Contractor in the regular course of business, including, but not limited to, office overhead and ongoing insurance costs. Delay damages shall not include Contractor or Subcontractor markup for overhead and profit, but only actual, documented, and direct actual costs. The District shall not be liable for any damages which the Contractor could have avoided by any reasonable means including, but not limited to, the more judicious handling of forces or equipment.
- d. The granting of an extension of time because of unavoidable delays shall in no way operate as a waiver on the part of the District of the right to collect liquidated damages for other delays or of any other rights to which the District is entitled.

22. LIQUIDATED DAMAGES

- a. The parties understand and agree that the goodwill, educational process, and other business of District will be damaged if the Project is not completed within the time limits required. The parties have further agreed that the exact amount of damages for failure to complete the Work within the time specified is, in some cases, extremely difficult, impractical, or impossible to determine. As to those damages that are difficult, impractical, or impossible to determine, Should the Contractor fail to achieve Final Completion of this Contract within the time fixed for Final Completion, together with extensions granted by the District for unavoidable delays, Contractor shall become liable to the District in the amount specified in the Contract per calendar day for each day the Contract remains incomplete beyond the time for Final Completion, as liquidated damages and not as a penalty. Contractor shall not be charged with liquidated damages when the delay in completion of the work beyond the time for Final Completion is due to acts of the District.
- b. Any money due or to become due the Contractor may be retained to cover liquidated and other delay damages. Should such money not be sufficient to cover those damages, the District shall have the right to recover the balance from the Contractor or Contractor's sureties.
- c. Should the District authorize suspension of the work for any cause, the time work is suspended will be added to the time for completion. Suspension of the work by the District shall not be a waiver of the right to claim liquidated or other delay damages as set forth in this section.

23. DISTRICT'S RIGHT TO STOP WORK; TERMINATION OR SUSPENSION OF THE CONTRACT

a. District's Right to Stop Work:

In addition to or as an alternative to any and all other remedies available to the District, if the Contractor fails to correct work which is not performed in accordance with the Contract Documents, or if the Contractor persistently fails to perform the work in accordance with the Contract Documents, the District may by written order direct the Contractor to stop the work, or any portion thereof, until the cause for such order has been eliminated to the satisfaction of the District. However, the right of the District to stop the work shall not give rise to a duty on the part of the District to exercise this right for the benefit of the Contractor or any other person or entity, and the failure of the District to do so shall not be raised as a defense to the Contractor's failure to perform the work in accordance with the Contract Documents.

b. Termination for Cause:

- 1) If the Contractor refuses or fails to furnish sufficient materials, work force, equipment, and appurtenances to properly prosecute the work in a timely manner, or if Contractor refuses or fails to comply with any provisions of the Contract

Documents, or if Contractor should file a bankruptcy petition or make a general assignment for the benefit of Contractor's creditors or if a receiver should be appointed on account of Contractor's insolvency, then the District may give the Contractor and Contractor's Surety written notice of intention to terminate the Contract. Unless within seven (7) calendar days after the serving of such notice upon the Contractor and Contractor's Surety such violation shall cease and arrangements for correction of such conditions shall be made satisfactory to the District, the Contract shall cease and terminate. In the event of such termination, the District shall immediately serve written notice thereof upon the Contractor and Contractor's Surety.

- 2) In the event of termination for cause, in addition to all remedies available to the District, the Contractor's Surety shall have the right to take over and perform the Contract; provided, however, that if the Surety does not commence performance within five (5) calendar days from the date of the issuance of such notice of termination, the District may take over the work and prosecute the same to completion by letting another Contract, or by any other method that the District deems advisable. The Contractor and Contractor's Surety shall be liable for any excess cost incurred by the District thereby, and in any such event the District may take possession of such materials, equipment, and other property belonging to the Contractor as may be on the site and use same in completing the work.

c. Termination or Suspension for Convenience:

The District reserves the right, in its sole discretion, to terminate or suspend all or part of the Contract for convenience following three (3) days written notice to the Contractor. In the event of termination or suspension for convenience, Contractor shall have no claims against the District, except:

- 1) The actual cost of labor, materials and services provided pursuant to the Contract, and which have not yet been paid for, as documented by timesheets, invoices, receipts and the like; and
- 2) Five percent (5%) of the total cost of the work performed as of the date of notice of termination or suspension or five percent (5%) of the value of the work yet to be completed, whichever is less. The parties agree that this amount shall constitute full and fair compensation for all Contractors lost profits and other damages resulting from the termination or suspension for convenience.

24. ASSIGNMENT OF CONTRACT

The Contractor may not assign or delegate all or any portion of this Contract without the written consent of the District and no such consent shall be given which would relieve the Contractor or its Surety of their responsibilities under the Contract. The Contractor may assign, without liability to the District, monies due the Contractor under the Contract to banks, trust companies or other financial institutions provided written notice thereof is promptly delivered to the District.

Assignment of monies earned by the Contractor shall be subject to the same retention as other payments made to Contractor, and shall also be subject to setoffs and back charges as provided by this Contract.

25. COORDINATION WITH OTHER CONTRACTS

- a. The District reserves the right to do other work or award other contracts in connection with this Project. By entering into this Contract, Contractor acknowledges that there may be other contractors on or adjacent to the Project site whose work must be coordinated with that of its own. Contractor expressly warrants and agrees that it will cooperate with other contractors and will do nothing to delay, hinder, or interfere with the work of other contractors, or that of the District, its Architect and Construction Manager. Contractor also expressly agrees that in the event its work is hindered, delayed, interfered with, or otherwise affected by a separate contractor, its sole remedy will be a direct action against the separate contractor. To the extent allowed by law, the Contractor expressly waives any remedy against the District, its Architect and Construction Manager on account of delay, hindrance, interference or other such events caused by a separate contractor.
- b. If any part of Contractor's work depends upon the work of a separate contractor, Contractor shall inspect such other work and promptly report in writing to the District and Architect any defects in such other work that render it unsuitable to receive the work of Contractor. Failure of the Contractor to so inspect and report shall constitute an acceptance of the other contractor's work, except as to defects which the Contractor could not have detected through the reasonable inspection of the other contractor's work prior to the execution of Contractor's work.
- c. If Contractor is aware of a current or potential conflict between Contractor's work and the work of another contractor on the site, and is unable to informally resolve the conflict directly with the other contractor, Contractor shall promptly provide written notice to the District, with a copy to the Architect and the other contractor, specifying the nature of the conflict, the date upon which the conflict arose, and the steps taken to attempt to resolve the conflict. The District may issue written instructions to address the conflict.
- d. If, through Contractor's negligence, any other contractor or subcontractor shall suffer loss or damage to the work, Contractor shall make a reasonable effort to settle with such other contractor and subcontractor by agreement or arbitration. If such other contractor or subcontractor shall assert any claim against the District or Architect, on account of any damage alleged to have been so sustained, the District or Architect shall notify the Contractor, who shall defend such proceedings at Contractor's own expense and save harmless and indemnify the District and the Architect from any such claim.

26. SUBMITTALS: SHOP DRAWINGS, CUTS AND SAMPLES

- a. Five (5) copies of shop drawings, brochures and cuts and samples in quantities specified by the Architect shall be submitted to the Architect for all items for which they are required by the plans and Specifications. Prior to transmittal, the Contractor shall examine all submittals for accuracy and completeness in order to verify their suitability for the work and

compliance with the Contract Documents and shall sign and date each submittal. Submittals shall be made sufficiently before the items are required for the work so as to cause no delay and shall be in accordance with the Project construction schedule.

- b. In addition to information furnished as common practice, submittals shall contain the Project name and location, Contractor's name and address, Subcontractor's or supplier's name and address, date of submittal and any revisions, and reference to appropriate specification section, and/or drawing and detail numbers. The Contractor and/or the Subcontractors shall verify in the field all dimensions and relationships to adjacent work necessary to ensure the proper fit of the items submitted. If necessary, the Contractor shall make any corrections required and resubmit with all due haste in the same number as initially required.
- c. Review of submittals, shop drawings, cuts or samples by the District or Architect shall not relieve the Contractor from complying with the requirements of the Contract Documents.
- d. Any materials or equipment installed without approval shall be at the Contractor's own risk, and Contractor may be required to remove any such materials or equipment and install the specified items at Contractor's own cost, including repairs to adjacent work.

27. PAYMENTS

a. Cost Breakdown:

Prior to submitting Contractor's first request for payment, the Contractor shall prepare and submit to the Architect and District a cost breakdown (schedule of values) showing the major work items for each trade or operation required in construction of the Project. The work items shall be sufficiently detailed to enable the Architect to accurately evaluate the completion percentages requested by the Contractor. The cost for each work item shall include overhead and profit. The total of all work item costs shall equal the amount of the Contract.

b. Scope of Payment:

Payment to the Contractor at the unit price or other price fixed in the Contract for performing the work required under any item or at the lump sum price fixed in the Contract for performing all the work required under the Contract shall be full compensation for furnishing all labor, materials, equipment and tools necessary to the work, and for performing and completing, in accordance with the Specifications, all work required under the item or under the Contract, and for all expense incurred by the Contractor for any purpose in connection with the performance and completion of the work.

c. Progress Payments:

The Contractor will, on or about the last day of each month, make an estimate of the value of the work completed by Contractor in the performance of the Contract. These estimates shall be subject to the review and approval of the Architect. The first such estimate will be

of the value of the work completed after the Contractor commenced the performance of the Contract, and every subsequent estimate, except the final estimate, will be of the value of the work completed since the immediately preceding estimate. Such estimates will be based on labor, materials and equipment incorporated into the work, and items of materials and equipment delivered to the Project. The Contractor shall be responsible for the security and protection of such materials and equipment delivered to the Project and not incorporated in the work. Within thirty (30) calendar days after the approval of each estimate for progress payment, the District will pay to the Contractor an amount equal to ninety five (95) percent of the approved estimate, unless a different retention percentage is stated in the Notice Inviting Bids, in which case that percentage applies. Payments may at any time be withheld if in the judgment of the District the work is not proceeding in accordance with the Contract Documents, the Contractor is not complying with the requirements of the Contract, stop notices have been timely filed, the estimate contains an error, or the District has incurred costs or requests reasonable financial assurances regarding defective work by the Contractor.

d. Final Payment:

Within thirty (30) days after all required work is fully completed in accordance with the Contract Documents, the Contractor shall submit a final invoice for the total value of the work completed in accordance with the Contract, which shall be subject to review and approval by the District. As required by law, District shall pay Contractor the unpaid balance of the Contract price of the work, or the whole Contract price of the work if no progress payment has been made, determined in accordance with the terms of the Contract, less such sums as may be lawfully retained under any provision of the Contract, including, but not limited to, amounts retained as liquidated damages, for stop notices, for third-party claims for which the Contractor is required to indemnify the District, for defective work and costs incurred by the District in connection therewith, or for other such claims and damages attributable to the Contractor (“Final Payment”). Prior progress estimates and payments are subject to correction in the Final Payment. Tender of the Final Payment shall constitute denial by the District of any unresolved claim. Contractor’s acceptance of the Final Payment shall operate as a full and final release to the District and its agents from any and all unasserted claims Contractor has, or may have, related to this Contract.

e. Payments Do Not Imply Acceptance of Work:

The granting of any progress payment or payments by the District or the receipt thereof by the Contractor shall not constitute acceptance of the work or of any portion thereof, and shall in no way lessen the liability of the Contractor to replace unsatisfactory work or material, whether or not the unsatisfactory character of such work or material was apparent or detected at the time such payment was made.

f. Retention of Sums Charged Against Contractor:

It is mutually understood and agreed that when under any provision of this Contract the District shall charge any sums of money against the Contractor, the amount of such charge shall be deducted and retained by the District from the amount of the next succeeding

progress estimate, or from any other monies due or that may become due the Contractor on account of the Contract. If on completion or termination of the Contract such monies due the Contractor are found insufficient to cover the District's charges against the Contractor, the District shall have the right to recover the balance from the Contractor or the Contractor's Sureties.

g. Release:

The Contractor and each assignee under an assignment in effect at the time of Final Payment shall, if required by the District, execute and deliver at the time of Final Payment and as a condition precedent to Final Payment, a release in form and substance satisfactory to and containing such exemptions as may be found appropriate by the District, discharging the District, its officers, agents and employees of and from liabilities, obligations and claims arising under this Contract.

h. Payment to Subcontractors and Suppliers:

The Contractor shall pay each Subcontractor and supplier promptly on receipt of each progress payment from the District for the materials, labor and equipment delivered to the site or incorporated in the work by each Subcontractor during the period for which the progress payment is made, less any retention as provided above.

i. Stop Notice Costs:

The District reserves the right to charge the Contractor or Surety, or to withhold from release of retention, all costs incurred by the District, including attorney's fees, for processing and defending stop notice claims.

28. MODIFICATIONS OF CONTRACT

a. Changes In The Work:

- 1) The District, before the date of acceptance of the work, may, without notice to the Sureties, order changes in the work ("Modifications"), may order extra materials and extra work in connection with the performance of the Contract, and the Contractor shall promptly comply with such orders. All Modifications must be approved by DSA and the State Fire Marshall, if applicable, as required by law.
- 2) If changes ordered in design, workmanship or materials are of such a nature as to increase or decrease the cost of any part of the work, the price fixed in the Contract shall be increased or decreased by such amount as represents the reasonable and proper allowance for the increase or decrease in the cost of the work in accordance with the provisions of this Article, and any other applicable terms of the Contract, including, but not limited to, the Contractor's schedule of values and the price for allowances, if any. Except as provided by law, the total cost of all Modifications shall not exceed ten (10) percent of the original Contract price.

- 3) In the case of a disputed work item, the District may direct the Contractor to perform the disputed work at no additional cost to the District on the grounds that the work is adequately indicated in the Contract Documents, and therefore already included in the Contract price. If the Contractor maintains that the disputed work represents a modification to the Contract, Contractor may submit a claim in accordance with Article 50, Resolution of Construction Claims. Notwithstanding any dispute regarding the requirements of the Contract Documents, Contractor shall promptly and fully comply with the District's directive. Contractor's failure to do so shall be deemed a material breach of this Contract, and in addition to all other remedies, District may, at its sole discretion, hire another contractor and/or use its own forces to complete the disputed work at Contractor's sole expense, and may deduct the cost of such work from the Contract price.

b. Cost Breakdown:

When the Modification is proposed, the Contractor shall furnish a complete breakdown of actual costs of both credits and extras, itemizing materials, labor, taxes, overhead and profit. Subcontract work shall be so indicated. All costs must be fully documented. The following limitations shall apply:

- 1) Limitations Where Contract Price Changes are Involved:
 - (a) Overhead and Profit for the Contractor. The Contractor's overhead and profit on the cost of subcontracts shall be a sum not exceeding ten percent (10%) of such costs. The Contractor's overhead and profit on the costs of work performed by the Contractor shall be a sum not exceeding fifteen percent (15%) of such costs. Overhead and profit shall not be applied to the cost of taxes and insurance by Contractor or Subcontractors or to credits. No processing or similar fees may be charged by the Contractor in connection with the Modification. "Overhead and profit" shall include all plant, equipment rental and repair, project management, field coordination, job site project supervision and indirect labor and materials.
 - (b) Bond Premiums. The actual rate of bond premiums as paid on the total cost (including taxes) will be allowed, but with no markup for profit and overhead.
 - (c) Taxes. State and city sales taxes should be indicated. Federal excise tax shall not be included. (District will issue an exemption on request.)
- 2) Change Order Certification:

All change orders and requests for proposed change orders shall be deemed to include the following certification by the Contractor:

"The undersigned Contractor approves the foregoing as to the changes in work, if any, and as to the Contract price specified for each item and as to the extension of time allowed, if any, for completion of the Project as stated herein, and agrees to furnish all labor, materials, and service and to perform all work necessary to complete any additional work specified for the consideration stated herein. Submission of claims which have no basis in fact or which Contractor knows are false are made at the sole risk of the Contractor and may be a violation of the False Claims Act, as set forth in Government Code §§12650 *et seq.* It is understood that the changes to the Contract Documents set forth herein shall only be effective upon approval by the Governing Board of the District.

"It is expressly understood that the value of the extra work or changes expressly includes any and all of the Contractor's costs and expenses, both direct and indirect, resulting from additional time required on the Project or resulting from delay to the Project. Any costs, expenses, damages, or time extensions not included herein are deemed waived."

c. Unit Prices, Schedule of Values, or Allowances:

Where Unit Prices, a Schedule of Values, and/or Allowances are required by the Contract Documents, that pricing shall govern in computing any additions to or deductions from the Contract price on account of any added or omitted work. Unit Prices listed in the original bid include all costs and no addition of any description will be allowed.

d. Time and Materials:

If it is impractical, because of the nature of the work, or for any other reason, to fix an increase in price in advance, the Change Order may fix a maximum price which shall not under any circumstances be exceeded, and subject to such limitation, such alteration, modification or extra shall be paid for at the actual necessary cost as determined by the sum of the following items (1) to (5) inclusive:

- 1) Labor, including premium on compensation insurance and charge for Social Security taxes, and other taxes pertaining to labor.
- 2) Material, including sales taxes and other taxes pertaining to materials.
- 3) Plant and equipment rental, to be agreed upon in writing before the work is begun. No charge for the cost of repairs to plant or equipment will be allowed.
- 4) Overhead and profit computed at fifteen percent (15%) of the total of Items (1) to (3) inclusive.
- 5) The proportionate cost of premiums on bonds computed at one and one-half percent (1-1/2%) of the total of items (1) to (4) inclusive.

If the Time and Materials work is done by a Subcontractor, the amount shall be determined as set forth above under items (1) to (5) inclusive. The Contractor's overhead and profit on the costs of subcontracts (exclusive of taxes and insurance) shall not exceed ten percent (10%) of such costs.

The District reserves the right to furnish such materials as it may deem expedient, and no allowance will be made for profit thereon. The above-described methods of determining the payment for work and materials shall not apply to the performance of any work or the furnishing of any material which, in the judgment of the District, may properly be classified under items for which prices are established in the Contract.

e. Oral Modifications:

No oral statements of any person shall in any manner or degree modify or otherwise affect the terms of the Contract.

29. INDEMNITY

Contractor shall defend with counsel acceptable to the District, indemnify and hold harmless to the full extent permitted by law, the District and its Board of Trustees, officers, agents, Architect, construction manager, employees and volunteers from and against any and all liability, loss, damage, claims, expenses, fines, judgments and costs (including, without limitation, attorney's fees and costs and fees of litigation) (collectively, "Liability") of every nature arising out of or in connection with Contractor's performance of the Project or its failure to comply with any of its obligations contained in these Contract Documents, except such Liability caused by the active negligence, sole negligence or willful misconduct of the District. Such indemnification shall extend to all claims, demands, or liabilities occurring after completion of the project as well as during the progress of the work. Pursuant to Public Contract Code §9201, District shall timely notify Contractor of receipt of any third-party claim relating to this Project.

30. WARRANTY OF TITLE

Contractor warrants that title to all work, materials or equipment included in a request for payment shall pass and transfer to the District whether or not they are installed or incorporated in the Project, free from any claims, liens or encumbrances, when such payment is made to the Contractor. Contractor further warrants that no such work, materials or equipment have been purchased for work under the Contract subject to an agreement by which an interest therein or an encumbrance thereon is retained by the seller or supplier.

31. USE OF COMPLETED PARTS OF THE WORK BEFORE ACCEPTANCE

Whenever the work or any part thereof is in a condition suitable for use, and the best interest of the District requires such use, as determined by the District, the District may take possession of, connect to, open for public use, or use the work or a part thereof. When so used, maintenance and repairs due to ordinary wear and tear or vandalism will be made at District's expense. The use by the District of the work or part thereof as contemplated in this section shall in no case be construed as

constituting acceptance of the work or any part thereof, including, but not limited to, the right to assess liquidated damages. Such use shall neither relieve the Contractor of any of Contractor's responsibilities under the Contract nor act as a waiver by the District of any of the conditions thereof. Contractor shall continue to maintain all insurance, including Builder's Risk insurance, on the entire Project, and diligently pursue full completion of the work.

32. GUARANTEE AND WARRANTY

- a. By signing this Contract, Contractor agrees to the following guarantee and warranty:

Guarantee & Warranty

Contractor hereby guarantees and warrants its work on the Project for a period of two (2) years from the date of the filing of the Notice of Completion as follows.

Contractor shall promptly repair or replace to the satisfaction of the District any or all work that appears defective in workmanship, equipment and/or materials for whatever reason, ordinary wear and tear and unusual abuse or neglect excepted, together with any other work which may be damaged or displaced in so doing.

Contractor agrees to promptly correct and remedy any failure by the Contractor to conform its work, activities and services to the requirements of the Contract Documents.

In the event of the Contractor's failure to comply with the above-mentioned obligations within the ten (10) calendar days of notice, or sooner if required by an emergency, Contractor hereby authorizes the District to have the defects or deficiencies repaired, remedied, corrected and made good at Contractor's expense, and Contractor shall pay the costs and charges therefore upon demand. The Surety agrees to be responsible for these costs and charges as well.

33. PROTECTION OF WORK AND PROPERTY

- a. The Contractor shall be responsible for each operation and all work on the Project, both permanent and temporary. The Contractor shall protect the work and materials from damage due to negligence, the action of the elements, the carelessness of third parties, vandalism, or any other cause whatsoever, until the final completion and acceptance of the Project. Should improper work by the Contractor be covered by another contractor and damage or defects result, the whole work affected shall be made good by the Contractor to the satisfaction of the Architect and District without expense to the District. The Contractor shall take reasonable care to avoid damage to existing facilities or utilities, whether on the Project or adjacent to it, and Contractor shall be liable for any damage thereto or interruption of service due to Contractor's operations. If the Contractor encounters any facilities or utilities not

shown on the drawings or not reasonably inferable therefrom, Contractor shall promptly notify the Architect about them, and shall do no further work which may cause damage to same. If it is determined that some action needs to be taken regarding facilities not shown, the Contractor will be given directives on what action to take, and any additional cost to the Contractor incurred thereby will be handled by Change Order.

- b. The property limits of the area of the Project are indicated on the drawings. Except for work specifically shown or noted, Contractor shall confine Contractor's operations within the indicated property limits. The Contractor shall provide, install, and maintain all shoring, bracing and underpinning necessary to support adjacent property, streets, buildings and structures, that may be affected by building operations for this work; shall serve or cause to be served all legal notices to adjoining property owners that may be necessary for their protection; and shall protect from damage all adjacent buildings, fences, landscaping, and repair or replace any such property damaged in the course of work under the Contract.

34. USE OF ROADWAYS AND WALKWAYS

The Contractor shall not unnecessarily interfere with use of any roadway, walkway or other facility for vehicular or pedestrian traffic by any party entitled to use it. Wherever such interference becomes necessary for the proper and convenient performance of the work and no satisfactory detour route exists, the Contractor shall, before beginning the interference, provide a satisfactory detour, temporary bridge, or other proper facility for traffic to pass around or over the interference and shall maintain it in satisfactory condition as long as the interference continues, all without extra payment unless otherwise expressly stipulated in the Contract Documents.

35. MATERIALS

- a. Unless explicitly stated otherwise, all specified equipment and material comprising the work of this Contract, as being provided or furnished or installed, shall imply the inclusion of all components, hardware and accessories, required for complete installation and satisfactory operation as intended by the manufacturer. Wherever the method of installation of any material is not explicitly specified, the installation shall be as recommended by manufacturer.
- b. Wherever in the Contract Documents it is provided that the Contractor shall furnish materials or equipment for which no detailed specifications are set forth, such materials or equipment shall be new and of the best grade for the purpose for which they will be used when incorporated in the work. Materials specified by reference to a number or symbol of a specific standard, such as A.S.M., Federal Specification, State Standard, Trade Association, or similar standards, shall comply with requirements in the latest revision thereof and any amendment or supplement in effect on the date of the notice inviting bids.
- c. None of the materials to be provided furnished or installed on this project shall contain asbestos or any other "hazardous substance" as that term is defined by federal or state law.

36. SUBSTITUTIONS

- a. Wherever in the drawings or Specifications a material or product is called for by trade or brand names or manufacturer and model number, alternative items of equal quality and purpose may be proposed for use by the Contractor. The burden of proof of equality is on the Contractor, and Contractor shall furnish all information and supplies necessary for the Architect to make a thorough evaluation of the proposed substitution. The Architect's decision about the equality of the proposed substitution is final, and if the proposed substitution is not approved, the Contractor shall install the item called for. Proposed substitutions and any changes in adjacent work caused by them shall be made by the Contractor at no additional cost to the District.
- b. Proposed substitutions shall be submitted sufficiently before actual need to allow time for thorough evaluation. Substitutions shall not be proposed for the reason that submittals were not made early enough to avoid delay. Architect's review of substitutions shall not relieve the Contractor from complying with the requirements of the drawings and Specifications.
- b. In the event Contractor makes substitutions in materials, equipment, or designs, with or without the District's approval, other than those authorized herein, the Contractor shall then assume full responsibility for the effects of such substitutions on the entire Project, including the design, and shall reimburse the District for any charges resulting from such substitutions, including any charges for modifications in the work of other trades, and including any charges for additional design and review, plus reasonable and customary mark-ups.

37. TESTING

- a. Materials, equipment, or other work requiring tests may be specified in the Contract Documents, and they shall be adequately identified and delivered to the site in ample time before intended use to allow for testing. If such materials, equipment or other work should be covered without required testing and approval, they shall be uncovered at the Contractor's expense, including any repairs or replacement resulting therefrom. The Contractor shall notify the District and Architect when and where such materials, equipment or other work are ready for testing, and Contractor shall bear the cost of making them available for testing. The Contractor shall notify the District and Architect sufficiently before the need for testing so as to cause no delay in the work and, in any case, at least forty-eight (48) hours prior to the need for testing.
- b. The cost of initial tests called for will be paid by the District and will be performed by independent testing consultants retained by the District, but if so specified by the District, the amount paid or a portion thereof may be collected from the Contractor. All other tests and inspections specified or otherwise required to substantiate compliance with specified requirements for quality of material or performance of operation shall be paid for by the District, but if so specified by the District, the amount paid may be collected from the Contractor. If retesting or additional testing is necessary because of substandard initial test results, the costs thereof shall be paid by the District, but if so specified by the District, the amount paid may be collected from the Contractor, including any repairs or replacement resulting therefrom.

38. INSPECTION

- a. All materials, equipment and workmanship used in the work of the Project shall be subject to inspection or testing at all times and locations during construction and/or manufacture. The District's and Architect's authorized representatives and representatives of other agencies having authority over the work shall have access to the work for the above purposes at all reasonable times and locations. Any material or work found to be unsatisfactory or not according to the Contract Documents shall be replaced with the correct material or work and the defective items promptly removed, all at the Contractor's expense, when directed to do so by any of the above-named persons having authority over the work. The cost of review time and analysis by the Architect or other District consultants necessitated by incomplete or defective work by the Contractor shall be charged to the Contractor.
- b. Inspection and testing by the District or its representatives shall not relieve the Contractor from complying with the requirements of the Contract Documents. The Contractor is responsible for its own quality control.
- c. Whenever required by the District or Architect, the Contractor shall furnish all tools, labor and materials necessary to make an examination of work in place by uncovering the same. Should such work be found unsatisfactory, the cost of examination and reconstruction shall be paid by the Contractor. Should such work be found satisfactory, the cost of examination and reconstruction of the work shall be paid by Change Order unless the Contractor improperly covered the work before it could be inspected or tested. If the Contractor considers it necessary or desirable to work on Saturday, Sunday or a holiday, Contractor shall seek written approval from the District at least forty-eight (48) hours before the commencement of such work.

39. CLEANUP

- a. The Contractor shall maintain the premises and area of the work in a neat and clean condition. No burning of rubbish on site shall be allowed. The Contractor shall control dust on the site by sprinkling at whatever intervals are necessary to keep it laid down and shall take measures to prevent dust and debris from being accidentally transported outside the area of the work.
- b. Final cleaning, such as sweeping, dusting, vacuuming, dry and wet mopping, polishing, sealing, waxing and other finish operations normally required on newly installed work shall be taken to indicate the finished conditions of the various new and existing surfaces at the time of acceptance. Prior to the time of acceptance, all marks, stains, fingerprints, dust, dirt, splattered paint and blemishes resulting from the various operations shall be removed throughout the Project. Stair treads and risers shall be wet-mopped. Glass shall be left clean and polished both inside and outside. Plumbing fixtures and light fixtures shall be washed clean. Hardware and other unpainted metals shall be cleaned and all building papers and other temporary protections shall be removed throughout the building, or portion of the building where Contractor was involved, all to the satisfaction of the Architect and District.

The exterior of the buildings, playfields, exterior improvements, and planting spaces and other work areas shall be similarly clean and in good order.

40. CONSTRUCTION WASTE MANAGEMENT REQUIREMENTS

a. Scope

- 1) This Article includes requirements for the diversion by the Contractor of construction and demolition debris from landfills. The Contractor shall develop and implement a Waste Management Plan as specified herein. The Contractor shall take a pro-active, responsible role in the management of construction and demolition waste and require all subcontractors, vendors, and suppliers to participate in the effort.
- 2) The District has established that this Project shall generate the least amount of waste practicable and that processes shall be utilized that ensure the generation of as little waste as possible due to over-packaging, error, poor planning, breakage, mishandling, contamination or other factors.
- 3) As much of the waste materials as economically feasible shall be reused, salvaged or recycled. Waste disposal in landfills shall be minimized.
- 4) The Contractor is encouraged to use waste hauling companies that separate recyclable materials. The Contractor shall work with its waste haulers in providing other recycling methods as appropriate.
- 5) The Contractor is responsible for implementation of any special programs involving rebates or similar incentives related to the recycling of waste. Revenues or other savings obtained for salvage or recycling accrue to the Contractor.

b. References

- 1) "Builders' Guide to Reuse and Recycling, A Directory for Construction and Demolition Materials."
- 2) "Construction Site Recycling, a Guide for Building Contractors ". For a copy of the guide call 1-888-442-2666 or go to www.recycleworks.org.
- 3) "Where to Recycle Construction and Demolition Debris." For a copy of the guide call 1-888-442-2666 or go to www.recycleworks.org.

c. Definitions

- 1) General: Construction and demolition waste includes products of demolition or removal, excess or unusable construction materials, packaging materials for construction products, and other materials generated during the construction

process but not incorporated into the work.

- 2) Divert" means to use material for any lawful purpose other than disposal in a landfill or transfer facility for disposal
- 3) "Recycling Service" means an off-site service that provides processing of material and diversion from a landfill.
- 4) "Hauler" means the entity that transports construction and demolition debris to either a landfill or a recycling service.

d. Compliance with regulatory requirements:

- 1) The Contractor shall perform all handling, storage, transportation and disposal of construction debris in compliance with all applicable Federal, State, regional, and local statutes, laws, regulations, rules, ordinance, codes and standards.
- 2) Nothing stated on the drawings, in this Article 40 or in any other provision of the Contract Documents shall be construed as allowing work that is not in strict compliance with all applicable Federal, State, regional, and local statutes, laws, regulations, rules, ordinances, codes and standards.

e. Performance Requirement

- 1) The Contractor shall divert a minimum of 50 percent (50%) of the total Project construction and demolition waste from landfills.

f. Quality Control

- 1) General:
 - i) The Contractor shall not permit materials designated for diversion to become contaminated or to contaminate the site or surrounding areas.
- 2) Training and Coordination:
 - i) The Contractor shall designate an on-site party [or parties] who will be responsible for instructing workers and subcontractors, and overseeing and documenting the results of the Waste Management Plan for the Project.
 - ii) The Contractor shall furnish copies of the Waste Management Plan to all on-site supervisors, each subcontractor, and the District's representative.
 - iii) The Contractor shall include construction waste management as an item on the agenda of all progress meetings.

- 3) **The Waste Management Plan:**
- i) The Contractor shall prepare a Waste Management Plan for diverting the specified percentage of construction debris from landfills, including written and graphic information indicating how the waste will be diverted.
 - ii) Include in the plan both on-site recycling of construction debris and off-site diversion from landfills.
 - iii) Identify the means and methods for collecting and separating each type of debris deemed reusable or recyclable.
 - iv) List the off-site recycling service and hauler of each designated debris item who has agreed to accept and divert that item from the landfill in the proposed quantities anticipated. List the service and hauler company name, address, telephone number, and persons contacted.
 - v) List the name of individuals on the Contractor's staff responsible for waste prevention and management.
 - vi) List the actions that will be taken to reduce solid waste generation, including coordination with subcontractors to ensure awareness and participation.
 - vii) Describe the specific approaches to be used in recycling/reuse of the various materials generated, including the areas on site and equipment to be used for processing, sorting, and temporary storage of wastes.
 - viii) Characterize the waste to be generated, including estimated types and quantities. Name the landfills and/or incinerator to be used.
 - ix) List the specific waste materials that will be salvaged for resale, salvaged and reused on the Project, salvaged and stored for reuse on a future project, or recycled. Recycling facilities that will be used shall be identified by name, location, and phone number.
 - x) Identify the materials that cannot be recycled or reused with an explanation or justification, to be approved by the Architect.

The Contractor shall submit the Plan to the Architect within 10 calendar days after receipt of the Notice to Proceed, or prior to any waste removal, whichever occurs first. The Contractor shall promptly revise and resubmit the Plan as required by the Architect. Review of the Contractor's Waste Management Plan will not relieve the Contractor of responsibility for compliance with applicable environmental regulations or meeting Project diversion requirements.

g. Plan Implementation

- 1) The Contractor shall implement the approved Waste Management Plan.
 - 2) The Contractor shall maintain a log of each load and of each category of waste that is diverted from the landfill. The Contractor shall separately log the debris sent to a Class III landfill and materials sent to recycling facilities.
 - 3) The Contractor shall include in the log the type of load, load weight, name of the hauling service, recycling service or landfill, and the date accepted by the recycling service or by the landfill.
 - 4) The Contractor shall retain and make available all weight tickets and copies of receipts and invoices relating to the implementation of the Plan.
 - 5) The District reserves the right to audit the log at any time.
- h. Material Handling
- 1) Designate a specific area or areas on site to facilitate the separation of materials for potential reuse, salvage, recycling, and return. Clearly mark bins for each category of waste.
 - 2) Keep waste bins and pile areas neat and clean. Do not contaminate non-recyclable waste with materials designated for reuse or recycling.
- i. Contractor's Responsibilities
- 1) Provide on-site instruction of the appropriate separation, handling, recycling, salvage, reuse, and return methods to be used by all parties at the appropriate stages of the Project.
 - 2) Separate, store, protect, and handle at the site identified recyclable and salvageable waste products in a manner that maximizes recyclability and salvagability of identified materials. Provide the necessary containers, bins and storage areas to facilitate effective waste management. Provide barriers and enclosures around recyclable material storage areas which are non hazardous and recyclable or reusable and which shall be located away from construction traffic. Provide adequate space for pick-up and delivery. Use cleaning materials that are non hazardous and biodegradable.

41. INSTRUCTIONS AND MANUALS

Three copies of the maintenance instructions, application/installation instructions and service manuals called for in the Specifications shall be provided by the Contractor. These shall be complete as to drawings, details, parts lists, performance data and other information that may be required for the District to easily maintain and service the materials and equipment installed under this Contract. All manufacturer's application/installation instructions shall be given to the Architect at least ten (10) days prior to first material application or installation of the item. The maintenance instructions

and manuals, along with any specified guarantees, shall be delivered to the Architect for review prior to submitting to District, and the Contractor or appropriate Subcontractors shall instruct District's personnel in the operation and maintenance of the equipment prior to final acceptance of the Project.

42. AS-BUILT DRAWINGS

The Contractor and all Subcontractors shall maintain on the work site a separate complete set of contract drawings which will be used solely for the purpose of recording changes made in any portion of the work during the course of construction, regardless of the reason for the change. As changes occur, there will be included or marked on this record set on a daily basis if necessary to keep them up to date at all times. Actual locations to scale shall be identified on the drawings for all runs of mechanical and electrical work, including all site utilities installed underground, in walls, floors, and furred spaces, or otherwise concealed. Deviations from the drawings shall be shown in detail. All main runs, whether piping, conduit, duct work, drain lines, etc., shall be located in addition by dimension and elevation. Progress payments may be delayed or withheld until such time as the record set is brought up to date to the satisfaction of the Architect. The Contractor shall verify that all changes in the work are included in the "AS-BUILT" drawings and deliver the complete set thereof to the Architect for review and approval within thirty (30) calendar days after District's notice of completion. District's acceptance and approval of the "AS-BUILT" drawings are a necessary condition precedent to the release of the final retention.

43. SUBSTITUTION OF SECURITIES

- a. Pursuant to Public Contract Code §22300, Contractor may request in writing that it be allowed at its own expense to substitute securities for moneys withheld by District to ensure performance under this Contract. Only securities listed in Government Code §16430 and bank or savings and loan certificates of deposit, interest-bearing demand deposit accounts, standby letters of credit, or any other security mutually agreed to by Contractor and District shall qualify under this Article. Securities equivalent to the amount withheld shall be deposited with the District or with a state or federally chartered bank in California as the escrow agent. Upon satisfactory completion of the Contract and on written authorization by the District, the securities shall be returned to Contractor. Contractor shall be the beneficial owner of the securities and shall receive any interest thereon. The Contractor may alternatively request District to make payment of retentions earned directly to the escrow agent at the expense of the Contractor.
- b. At the expense of the Contractor, the Contractor may direct the investment of the payments into securities and the Contractor shall receive the interest earned on the investments upon the same terms provided for above for securities deposited by Contractor. Upon satisfactory completion of the Contract, Contractor shall receive from the escrow agent all securities, interest, and payments received by the escrow agent from the District. The Contractor shall pay to each Subcontractor, not later than 20 days of receipt of payment, the respective amount of interest earned, net of costs attributed to retention withheld from each Subcontractor, on the amount of retention.

- c. Any escrow agreement entered into pursuant to this Article shall comply with Public Contract Code §22300 and shall be subject to approval by District's counsel.

44. NO DISCRIMINATION

It is the policy of the District that, in connection with all work performed under this public works contract, there shall be no discrimination against any prospective or active employee or any other person engaged in the work because of actual or perceived race, color, ancestry, national origin, ethnic group identification, religion, sex, gender, sexual orientation, age, physical or mental disability, or marital status. The Contractor agrees to comply with applicable Federal and California laws including, but not limited to, the California Fair Employment Practice Act, beginning with Government Code §12900, Government Code §11135, and Labor Code §§ 1735, 1777.5, 1777.6 and 3077.5. In addition, the Contractor agrees to require like compliance by all Subcontractors and suppliers.

45. LABOR STANDARDS

a. Work Hours:

In accordance with Labor Code §1810, eight (8) hours of labor shall constitute a legal day's work under this Contract. Contractor and any Subcontractor shall pay workers overtime pay as required by Labor Code §1815. The Contractor shall pay each worker, laborer, mechanic or persons performing work under this Contract at a rate not less than the prevailing wage for each craft or classification covering the work actually performed.

b. Penalty:

Contractor shall forfeit to District as a penalty the sum of twenty-five dollars (\$25.00) for each worker employed in the execution of this Contract by Contractor or any Subcontractor for each calendar day during which the worker is required or permitted to work more than eight (8) hours in any one (1) calendar day or more than forty (40) hours per calendar week in violation of Article 3, Division 2, Part 7, Chapter 1 of the California Labor Code.

c. Employment of Apprentices:

Contractor shall comply with Labor Code §§1773.3, 1777.5 and 1777.6, and 3077 *et. seq.*, each of which is incorporated by reference into this Contract. These sections require that contractors and subcontractors employ apprentices in apprenticeable occupations in a ratio of not less than one (1) hour of apprentice work for every five (5) hours of labor performed by a journeyman, unless an exception is granted and that Contractors and Subcontractors shall not discriminate against otherwise qualified employees as apprentices on any public works solely on the ground of actual or perceived race, religion, color, national origin, ethnic group identification, sex, gender, sexual orientation, age, or physical or mental disability. Only apprentices who are in training under written apprenticeship occupations shall be employed. The responsibility for compliance with these provisions for all apprenticeable occupations rests with Contractor.

- d. The Contractor shall be knowledgeable of and comply with Labor Code §§1727, 1773.5, 1775, 1777, 1777.5, 1810, 1813, 1860, including all amendments thereto; each of these sections is incorporated by reference into this Contract.

46. GENERAL RATE OF PER DIEM WAGES

a. On File:

As required by Labor Code §1773.2, the District has available copies of the general prevailing rate of per diem wages for workers employed on public work as determined by the Director of the Department of Industrial Relations, which shall be available to any interested party on request. Contractor shall post a copy of the document at each job site.

b. Prevailing Wage Rate:

The Contractor and each Subcontractor shall pay each worker performing work under this Contract at a rate not less than the prevailing wage as defined in Labor Code §1771 and 1774 and §16000(a) of Title 8, California Code of Regulations.

c. Penalty:

In accordance with §1775 of the Labor Code, the Contractor shall forfeit to the District as penalty, the sum of \$200 for each calendar day, or portion thereof, for each worker paid less than the prevailing wage rates, as determined by the Director of the California Department of Industrial Relations, for any work done under this Contract by Contractor or by any Subcontractor. Contractor shall also pay each worker the difference between the stipulated prevailing wages rates and the amount actually paid to such worker.

47. RECORD KEEPING

- a. The Contractor agrees to comply with the provisions of §§1776 and 1812 of the Labor Code. The Contractor and each Subcontractor shall keep or cause to be kept an accurate record showing the names, addresses, social security numbers, work classifications, straight time and overtime hours worked each day and week of all workers employed by Contractor in connection with the execution of this Contract or any subcontract thereunder and showing the actual per diem wages paid to each of such workers. These records shall be certified and shall be open at all reasonable hours to the inspection of the District awarding the Contract, its officers and agents, and to the Chief of the Division of Labor Statistics and Law Enforcement of the State Department of Industrial Law Enforcement of the State Department of Industrial Relations, and his or her other deputies and agents.

- b. In addition, copies of the above records shall be available as follows:

- 1) A certified copy of an employee's payroll record shall be made available for inspection or furnished to the employee or his or her authorized representative on request;
 - 2) A certified copy of all payroll records shall be made available for inspection or furnished upon request to the District, the Division of Labor Standards Enforcement, and the Division of Apprenticeship Standards of the Department of Industrial Relations;
 - 3) A certified copy of all payroll records shall be made available upon request by the public for inspection or copies thereof made; provided, however, that a request by the public shall be made through either the District, the Division of Apprenticeship Standards, or the Division of Labor Standards Enforcement. If the requested payroll records have not been previously provided, the requesting party shall, prior to being provided the records, reimburse the costs of the Contractor, Subcontractors, and the entity through which the request was made. The public shall not be given access to the records at the principal office of the Contractor.
- c. The Contractor shall file a certified copy of the records with the entity requesting the records within ten days after receipt of a written request. Any copy of records made available for inspection as copies and furnished upon request to the public or any public agency by the District, shall be marked or obliterated in such a manner as to prevent disclosure of an individual's name, address, and social security number. The name and address of the Contractor awarded the Contract or performing the Contract shall not be marked or obliterated.
- d. The Contractor shall inform the Owner of the location of the records, including the street address, city and county, and shall, within five working days, provide a notice of a change of location and address.
- e. In the event of noncompliance with the requirements of this section, the Contractor shall have ten days in which to comply subsequent to receipt of written notice specifying in what respects the Contractor must comply with this section. Should noncompliance still be evident after the ten day period, the Contractor shall, as a penalty to the District, forfeit \$100 for each calendar day, or portion thereof, for each worker, until strict compliance is effectuated. Upon the request of the Division of Apprenticeship Standards or the Division of Labor Standards Enforcement, these penalties shall be withheld from progress payments then due.
- f. Responsibility for compliance with this provision shall be with the Contractor.

48. PROJECT COMPLETION

- a. When all of the work to be performed under this Contract has been fully completed, the Contractor shall notify the Architect and District, in writing, setting a date for inspection.

The Contractor and Subcontractor representatives shall attend the inspection. As a result of this inspection, the Architect will prepare a list of items ("punch list") that are incomplete or not installed according to the Contract Documents. Failure to include items on this list does not relieve the Contractor from fulfilling all requirements of the Contract Documents.

- b. The Architect will promptly deliver the punch list to the Contractor and it will include a period of time by which the Contractor shall complete all items listed thereon. On completion of all items on the punch list, verified by a final inspection, and all other Contract requirements, so that Final Completion has been achieved to the District's satisfaction, the District will file a Notice of Completion with the County Recorder. Payment of retention from the Contract, less any sums withheld pursuant to the terms of this Contract or applicable law, shall not be made sooner than thirty-five (35) calendar days after the date of filing of Notice of Completion.
- c. The District reserves the right to occupy buildings and/or portions of the site at any time before Completion, and occupancy shall not constitute final acceptance of any part of the Work covered by the Contract Documents, nor shall such occupancy extend the date specified for completion of the Work. Beneficial occupancy of building(s) does not commence any warranty period or entitle Contractor to any additional compensation due to such occupancy, or affect in any way or amount Contractor's obligation to pay liquidated damages for failure to complete the Project on time.

49. TRENCHING OR OTHER EXCAVATIONS

a. Excavations or Trenches Deeper than Four Feet:

If the Project involves digging trenches or other excavations that extend deeper than four feet, the following provisions shall be a part of this Contract:

- 1) The Contractor shall promptly, and before the following conditions are disturbed, provide written notice to the District if the Contractor finds any of the following conditions:
 - (a) Material that the Contractor believes may be a hazardous waste, as defined in §25117 of the Health and Safety Code, which is required to be removed to a Class I, Class II, or Class III disposal site in accordance with the provisions of existing law.
 - (b) Subsurface or latent physical conditions at the site which are different from those indicated or expected.
 - (c) Unknown physical conditions at the site of any unusual nature or which are materially different from those ordinarily encountered and generally recognized as inherent in work which the Contractor generally performs.
- 2) In the event that the Contractor notifies the District that Contractor has found any of the conditions specified in subparagraphs (a), (b) or (c), above, the District shall

promptly investigate the condition(s). If the District finds that the conditions are materially different or that a hazardous waste is present at the site which will affect the Contractor's cost of, or the time required for, performance of the Contract, the District shall issue a change order in accordance with the procedures set forth in this Contract.

- 3) In the event that a dispute arises between the District and the Contractor regarding any of the matters specified in Paragraph (2), above, the Contractor shall proceed with all work to be performed under the Contract and the Contractor shall not be excused from completing the Project as provided in the Contract. In performing the work pursuant to this Paragraph, the Contractor retains all rights provided by Article 50 which pertains to the resolution of disputes between the contracting parties.

b. Regional Notification Center:

The Contractor, except in an emergency, shall contact the appropriate regional notification center at least two (2) days prior to commencing any excavation if the excavation will be conducted in an area that is known, or reasonably should be known, to contain subsurface installations other than the underground facilities owned or operated by the District, and obtain an inquiry identification number from that notification center. No excavation shall be commenced and/or carried out by the Contractor unless an inquiry identification number has been assigned to the Contractor or any Subcontractor and the Contractor has given the District the identification number. Any damages or delays arising from Contractor's failure to make appropriate notification shall be at the sole risk and expense of the Contractor and shall not be considered for an extension of the Contract time.

c. Existing Utility Lines:

- 1) Pursuant to Government Code §4215, the District assumes the responsibility for removal, relocation, and protection of main or trunk utility lines and facilities located on the construction site at the time of commencement of construction under this Contract with respect to any such utility facilities that are not identified in the plans and Specifications. Contractor shall not be assessed liquidated damages for delay in completion of the Project caused by the failure of the District or the owner of a utility to provide for removal or relocation of such utility facilities.
- 2) Locations of existing utilities provided by the District shall not be considered exact, but approximate within reasonable margin and shall not relieve Contractor of responsibilities to exercise reasonable care nor costs of repair due to Contractor's failure to do so. The District shall compensate Contractor for the costs of locating and repairing damage not due to the failure of Contractor to exercise reasonable care, and removing or relocating such utility facilities not indicated in the plans and Specifications with reasonable accuracy.
- 3) No provision herein shall be construed to preclude assessment against Contractor for any other delays in completion of the Project. Nothing in this section shall be

deemed to require the District to indicate the presence of existing service laterals, appurtenances, or other utility lines, with the exception of main or trunklines, whenever the presence of such utilities on the site of the construction Project can be inferred from the presence of other visible facilities, such as buildings, meter and junction boxes, on or adjacent to the site of the construction.

- 4) If Contractor, while performing work under this Contract, discovers utility facilities not identified by the District in the Project plans and Specifications, Contractor shall immediately notify the District and the utility in writing. The cost of repair for damage to above-mentioned visible facilities without prior written notification to the District shall be borne by the Contractor.

d. Prompt Notification:

Contractor understands, acknowledges and agrees that the purpose for prompt notification to the District pursuant to these provisions is to allow the District to investigate the condition(s) so that the District shall have the opportunity to decide how the District desires to proceed as a result of the conditions. Accordingly, failure of Contractor to promptly notify the District in writing, pursuant to these provisions, shall constitute Contractor's waiver of any claim for damages incurred as a result of the conditions.

e. Trenches Five Feet and Deeper:

Pursuant to Labor Code §6705, if the Contract price exceeds \$25,000 and involves the excavation of any trench or trenches five (5) feet or more in depth, the Contractor shall, in advance of excavation, promptly submit to the District and/or a registered civil or structural engineer employed by the District or Architect, a detailed plan showing the design of shoring for protection from the hazard of caving ground during the excavation of such trench or trenches.

50. RESOLUTION OF CONSTRUCTION CLAIMS

- a. Public work claims of \$375,000 or less between the Contractor and the District are subject to the provisions of Article 1.5 (commencing with §20104) of Chapter 1 of Part 2 of the Public Contract Code (“Article 1.5 claim”). For purposes of Article 1.5, "public work" has the same meaning as set forth in §§3100 and 3106 of the Civil Code; "claims" means a separate demand by Contractor for a time extension or payment of money or damages arising from work done by or on behalf of Contractor pursuant to the Contract and payment of which is not otherwise expressly provided for or the claimant is not otherwise entitled to or the amount of the payment which is disputed by the District.
- b. All claims shall be submitted on or before the date of the Final Payment and shall include all documents necessary to substantiate the claim. District shall respond in writing within 45 days of receipt of claim if the claim is less than or equal to \$50,000 ("50,000 claim") or within 60 days if the claim is over \$50,000 but less than or equal to \$375,000 ("50,000 - \$375,000 claim"). In either case, District may request in writing within 30 days of receipt

of claim any additional documentation supporting the claim or relating to any defenses to the claim which the District may have against the Contractor. Any additional information shall be requested and provided upon mutual agreement of the District and the Contractor. District's written response to the claim shall be submitted to Contractor within 15 days after receipt of the further documentation for \$50,000 claims or within 30 days after receipt of the further documentation for \$50,000 - \$375,000 claims or within a period of time no greater than that taken by the Contractor in producing the additional information, whichever is greater.

- c. Within 15 days of receipt of the District's response, if Contractor disputes the District's written response, or within 15 days of the District's failure to respond within the time prescribed, the Contractor shall provide written notification to District demanding an informal conference to meet and confer ("conference") to be scheduled by District within 30 days. Following the conference, if any claim or portion remains in dispute, the Contractor may file a claim as provided in Chapter 1 (commencing with §900) and Chapter 2 (commencing with §910) of Part 3 of Division 3.6 of Title 1 of the Government Code. For purposes of those provisions, the period of time within which a claim must be filed is tolled from the time the claimant submits a written claim pursuant to this section until the time that claim is denied as a result of the conference process, including any period of time utilized by the meet and confer process.
- d. Pursuant to Public Contract Code §20104.2(f), this section does not apply to tort claims and does not change the period for filing claims or actions specified by Chapter 1 (commencing with §900) and Chapter 2 (commencing with §910) of Part 3 of Division 3.6 of Title 1 of the Government Code.
- e. If a civil action is filed, within 60 days, but no earlier than 30 days, following the filing of responsive pleadings, the court shall submit the matter to nonbinding mediation unless waived by mutual stipulation of both parties. The mediation process shall provide that both parties select a disinterested third person mediator within 15 days, shall be commenced within 30 days of the submittal, and shall be concluded within 15 days of the commencement of the mediation unless time is extended upon a good cause showing to the court or by stipulation of the parties. If the parties fail to select a mediator within the 15-day period, any party may petition the court to appoint the mediator.
- f. If the matter remains in dispute, the case shall be submitted to judicial arbitration as set forth in Public Contract Code §§20104.4 (b)(1) through (b)(3).
- g. For any claim in excess of \$375,000, the Contractor and the District shall follow the same process as for an Article 1.5 claim. The District will forward a response within 60 days of submittal of any such claim. Judicial arbitration is not required for claims in excess of \$375,000.

Claims shall also be processed consistent with Public Contract Code section 9204, which provides processing timelines and procedures, and requires that undisputed claims be promptly paid in accordance with this code provision.

- h. In addition, for all unresolved claims that the Contractor wishes to pursue, the Contractor shall file a timely claim pursuant to the Government Claims Act and shall otherwise comply with the procedures set forth in that Act prior to commencing any litigation against the District. The accrual date for any such claim is the date the dispute or controversy first arose regarding the issues raised in the claim.
- i. “The date of Final Payment,” as used in this Article 50, means the date the public entity is required to release retention proceeds in accordance with Public Contract Code §7107 regardless of whether any payment is made to the Contractor at that time.
- j. The claims required by this Article are jurisdictional and conditions precedent to the commencement of any further legal proceedings. Strict compliance with all filing deadlines is mandatory.

51. LABOR COMPLIANCE

If this Contract is for a public works project over \$25,000 or for a maintenance project over \$15,000, Contractor acknowledges that the project is subject to compliance monitoring and enforcement by the California Department of Industrial Relations. In accordance with SB 854 (California Labor Code sections 1725.5 and 1770 *et seq.*), all bidders, contractors and subcontractors working at the site shall be duly registered with the Department of Industrial Relations at time of bid opening and at all relevant times. Proof of registration shall be provided as to all such contractors prior to the commencement of any work. Contractor shall coordinate with the Architect to ensure that DIR is advised of the award of the construction contract in a timely manner by filing form PWC-100 with DIR within thirty days of award of the contract, but no later than the first day in which the Contractor has workers employed upon the project.

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53. DRUG-FREE WORKPLACE CERTIFICATION

Contractor certifies all of the following:

- 1) Contractor is aware of the provisions and requirements of California Government Code §§ 8350 *et seq.*, the Drug Free Workplace Act of 1990.
- 2) Contractor is authorized to certify, and does certify, that a drug free workplace will be provided by doing all of the following:
 - a) Publishing a statement notifying all employees that the unlawful manufacture, distribution, dispensation, possession or use of a controlled substance is prohibited in Contractor's workplace and specifying actions which will be taken against employees for a violation of the prohibition;
 - b) Establishing a drug-free awareness program to inform employees about all of the

following:

- (i) The dangers of drug abuse in the workplace;
 - (ii) Contractor's policy of maintaining a drug-free workplace;
 - (iii) The availability of drug counseling, rehabilitation and employee-assistance programs; and
 - (iv) The penalties that may be imposed upon employees for drug abuse violations;
- c) Requiring that each employee engaged in the performance of Work on the Project be given a copy of the statement required by subdivision (a), above, and that as a condition of employment by Contractor in connection with the Work on the Project, the employee agrees to abide by the terms of the statement.
- 3) Contractor understands that if the District determines that Contractor has either: (a) made a false certification herein, or (b) violated this certification by failing to carry out and to implement the requirements of Government Code §§ 8350 et seq., the Contract is subject to termination, suspension of payments, or both. Contractor further understands that, should Contractor violate the terms of the Drug-Free Workplace Act of 1990, Contractor may be subject to debarment in accordance with the provisions of Government Code §§ 8350, et seq.

54. PROVISIONS REQUIRED BY LAW DEEMED INSERTED

Every provision of law and clause required by law to be inserted in this Contract shall be deemed to be inserted, and this Contract shall be read and enforced as though it were included, and if through mistake or otherwise any provision is not inserted or is not correctly inserted, upon application of either party the Contract shall be amended to make the insertion or correction. All references to statutes and regulations shall include all amendments, replacements, and enactments on the subject which are in effect as of the date of this Contract.

55. GENERAL PROVISIONS

a. Assignment and Successors:

Neither party may transfer or assign its rights or obligations under the Contract Documents, in part or in whole, without the other party's prior written consent. The Contract Documents are binding on the heirs, successors, and permitted assigns of the parties hereto.

b. Third Party Beneficiaries:

There are no intended third party beneficiaries to the Contract.

c. Choice of Law and Venue

The Contract Documents shall be governed by California law, and venue shall be in the Superior Court of the county in which the project is located, and no other place.

d. Severability

If any provision of the Contract Documents is determined to be illegal, invalid, or unenforceable, in part or in whole, the remaining provisions, or portions of the Contract Documents shall remain in full force and effect.

e. Entire Agreement

The Contract Documents constitute the final, complete, and exclusive statement of the terms of the agreement between the parties regarding the subject matter of the Contract Documents and supersedes all prior written or oral understandings or agreements of the parties.

f. Waiver

No waiver of a breach, failure of any condition, or any right or remedy contained in or granted by the provisions of the Contract Documents shall be effective unless it is in writing and signed by the party waiving the breach, failure, right, or remedy. No waiver of any breach, failure, right, or remedy shall be deemed a waiver of any other breach, failure, right, or remedy, whether or not similar, nor shall any waiver constitute a continuing waiver unless the writing so specifies.

g. Headings

The headings in the Contract Documents are included for convenience only and shall neither affect the construction or interpretation of any provision in the Contract Documents nor affect any of the rights or obligations of the parties to the Contract.

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DIVISION 01

GENERAL REQUIREMENTS

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**SECTION 01 11 00
SUMMARY OF WORK**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. All Contract Documents shall be reviewed for applicable provisions related to the provisions in this document, and provisions in the General Conditions and other Division 1 Specification Sections shall apply to this Section without limitation.

1.2 RELATED REQUIREMENTS SPECIFIED IN OTHER SECTIONS

- A. Section 00 54 36 – “Building Information Modeling (BIM)”
- B. Section 01 14 00- “Work Restrictions”
- C. Section 01 29 00 – “Payment Procedures”
- D. Section 01 31 19 – “Project Meetings”
- E. Section 01 31 80 – “Document Management System”
- F. Section 01 32 13 – “Scheduling of Work”
- G. Section 01 32 33 – “Photographic Documentation”
- H. Section 01 33 00 – “Submittal Procedures”
- I. Section 01 35 20 – “Site Security & Safety”
- J. Section 01 45 00 – “Quality Control”
- K. Section 01 43 39 – “Mockups”
- L. Section 01 62 00 – “Product Options”
- M. Section 01 77 00 – “Closeout Procedures”
- N. Section 01 78 36 – “Warranties”
- O. Section 01 78 39 – “Project Record Documents”
- P. Section 01 79 00 – “Demonstration and Training”
- Q. Divisions 2 through 41 Sections for Summary of Work requirements for the work in those Sections.

1.3 WORK DESCRIPTIONS WITHOUT FORCE

- A. All general descriptions and/or general summaries of the work noted in this section, or elsewhere within the Contract Documents, are without force and effect on the Contract Work described and indicated in detail the Construction Documents. These general descriptions and summaries are for general reference and descriptive purposes only and in no way offer the complete and concise description of all the Work required by the Contract Documents.

1.4 WORK COVERED BY CONTRACT DOCUMENTS

- A. The intent of the Contract Documents includes but is not limited to:

In general, the Work consists of, but is not limited to, remodel of an existing Community Stadium Upgrade Project and the construction of Track and Field renovation and related Path of Travel,, installation of slabs and access for future portable stands, storm drain, irrigation & other site development. Optional Services include Landscape, Lighting, Electrical, and Low Voltage utilities, , and other Work indicated in the Contract Documents.

B. CONTRACTS

1. Perform the work under a single, fixed-price Contract.

1.5 PROJECT INFORMATION

A. Project Identification: Community Stadium Upgrade Project

1. Project Location: 7351 Tompkins Hill Rd., Eureka, CA 95501
2. Architect’s Project Number: 09623.00

B. Owner (District): Redwoods Community College District

C. Architect: tBP/ Architecture

1. Location: 1777 Oakland Blvd, Ste 320, Walnut Creek, CA 94596

D. Web-Based Project Software: Project software provided and administered by the contractor will be used for the purposes of managing communication and documents during the construction stage. Refer to Section 01 31 80 Document Management System

1.6 CONTRACTOR PERSONNEL & PERSONNEL QUALIFICATIONS

A. Qualifications: In addition to the requirements of Article 3.2 of the Conditions of the Contract (Section 00 70 00), the Contractor shall employ full time (8 hours per work day) at the Site (with the exception of the Project Manager), unless otherwise approved by the District, the following individuals with the following minimum experience levels:

1. **Project Manager:** This individual must have a minimum of 10 years of construction experience on similar public building projects, including the completion of two public projects involving similar building construction exceeding \$20 million in value over the last ten years. One of these projects shall have been under the jurisdiction of DSA. This individual shall visit the Site a minimum of once a week to meet with the District’s Construction Manager.
2. **On-Site General Superintendent (Full Time at the Site):** This individual must have a minimum of 15 years of experience on similar public building projects, including the completion of two public projects involving similar building construction exceeding \$20 million in value over the last ten years. One of these projects shall have been under the jurisdiction of DSA.
3. **On-Site Project Engineer (Full Time at the Site):** This individual must have a minimum of 3 years of construction experience on similar public building projects with completion of one public project involving similar building construction in excess of \$20 million in value over the last three years.
4. **BIM Coordinator –** see requirements of Section 00 54 36 Article 10. Construction Roles and Responsibilities.

1.7 WORK BY DISTRICT

- A. General: Cooperate fully with District so work may be carried out smoothly, without interfering with or delaying work under this Contract or work by District. Coordinate the Work of this Contract with work performed by District.
- B. District reserves the right to perform construction operations with its own forces or to employ separate contractors on portions of the Project. Coordinate with this work in terms of providing site access, workspace, and storage space, cooperation of work forces, scheduling, and technical requirements.
- C. Coordination with District’s Forces or District’s Contractors:
 - 1. Provide site access, space allocation, scheduling, scheduling coordination, coordination of work forces and coordination of technical requirements with contractors that may be selected and employed by District to perform work simultaneously and in conjunction with the Work, which may include, but shall not be limited to the following, as applicable to the Project:
 - a. Materials Inspection and Testing Agency
 - b. Surveying
 - c. Geotechnical Engineering and Consulting
 - d. Furniture contractors
 - e. Other District consultants and contractors not listed here but that may be required for successful completion of the Project.

1.8 WORK UNDER SEPARATE CONTRACTS

- A. General: Cooperate fully with separate contractors so work on those contracts may be carried out smoothly, without interfering with or delaying Work under this Contract or other contracts. Coordinate the Work of this Contract with work performed under separate contracts.
- B. Preceding Work: District has awarded, or will award before commencement of this Contract, separate contract(s) for the following construction operations at Project site. Those operations are scheduled to be substantially complete before Work under this Contract begins.
 - 1. Sitework and underground utilities to prepare for the work of this Contract.
- C. Subsequent Work: District will award separate contract(s) for the following additional work to be performed at site concurrently with the work of this Contract or following Substantial Completion of the work of this Contract. Completion of that work will depend on successful completion of preparatory Work under this Contract.
 - 1. The subsequent phase of construction to begin once this contract is completed, or concurrently, pertains to the Physical Education and Field House Building Replacements.

1.9 WORK SEQUENCE

- A. Construct work as shown in the Contract Documents. Coordinate Baseline CPM Schedule activities and construction operations with District and the Architect. Provide 40 Work Day activity for anticipated rain delays as a “bank”. Insert this rain bank as the last activity prior to

Substantial Completion of the Gym and Field House. Include an additional 20 Work Day rain delay activity for completion of the demolition of the existing PE structures.

- B. Scheduling of Contractor's use of the areas and times involved shall be determined in cooperation with the District. Notify the District a minimum of 10-days prior to commencement of work.
- C. Construction activities shall be performed between the hours of 7AM and 5PM, Monday through Friday, unless otherwise required. No Work shall be performed outside the above hours without prior written authorization from the Construction Manager/Project Manager. No work on Sundays or Holidays will be permitted.

1.10 ACCESS TO SITE

- A. General: Project is located on College of the Redwoods campus property. Contractor shall have limited use of campus for delivery and Project site access purposes only during construction period. Contractor shall have full use of Project site for construction operations during this time. Contractor's use of Project site is limited only by District's right to perform work or to retain other contractors on portions of Project.
- B. Condition of Existing Grounds: Maintain portions of existing grounds, landscaping, and hardscaping affected by construction operations throughout construction period. Repair damage caused by construction operations.

1.11 USE OF PREMISES

- A. Contractor shall only use the premises for work, storage, staging areas, and vehicular parking as designated in the Contract Documents.
- B. Use of Site: Limit use of Project site to areas within the Contract limits indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.
 - 1. Limits: Confine construction operations to areas permitted by law, ordinances, permits, and Contract Documents.
 - 2. Driveways, Walkways and Entrances: Keep driveways, loading areas, and entrances serving premises clear and available to District, District's employees, Residents, and emergency vehicles at all times. Do not use these areas for parking or for storage of materials.
 - a. Schedule deliveries to minimize use of driveways and entrances by construction operations, and to minimize space and time requirements for storage of materials and equipment on-site.

1.12 EXISTING AREA CONDITION SURVEY

- A. Prior to commencement of work, jointly survey the existing area to be remodeled with the District and Architect, noting and recording existing damage such as cracks, sags, and other damage (on Site Plan/Floor Plans).
- B. This record shall serve as a basis for determination of subsequent damage to these items due to settlement, movement, demolition, or Contractor's operations.

- C. Existing damage observed shall be marked and the official record of existing damage shall be signed by the parties making the survey.
- D. Cracks, sags, and damage to the area and other items not noted in the original survey but subsequently observed shall be reported immediately to the Architect.
- E. Contractor shall comply with Section 01 32 33 for photographic and video recording of existing conditions.

1.13 PROTECTION OF EXISTING STRUCTURES AND UTILITIES

- A. The Drawings may not show all existing water, gas, electrical, and hot water lines, and other items known or suspected to exist around the work.
- B. Contractor shall locate these installations before proceeding with demolition or other operations which may cause damage, maintain them in service where appropriate, and repair damage caused by the performance of the Work, at no increase in the Contract Sum.
- C. In addition to notification, if a structure or utility is damaged, take appropriate action as specified in the General Conditions.

1.14 USE AND OCCUPANCY OF WORK PRIOR TO ACCEPTANCE BY DISTRICT

- A. The District may use and occupy the building before formal acceptance under the following conditions:
 - 1. A Certificate of Substantial Completion shall be prepared and executed as provided in the Contract Documents. See Section 01 77 00 Contract Closeout Procedures. The Certificate of Substantial Completion shall be accompanied by a written endorsement of the Contractor's insurance carrier and surety permitting occupancy by the District during the remaining period of the work.
 - 2. Occupancy by the District shall not be construed as being an acceptance of that part of the Work occupied.
 - 3. The Contractor will not be held responsible for damage to the occupied part of the Work resulting from the District's occupancy.
 - 4. Occupancy by the District shall not be deemed to constitute a waiver of existing claims the District or Contractor may have against each other.
 - 5. Comply with Specification Section 01 78 36, Warranties, and 01 77 00 Contract Closeout Procedures for the Work or any Phase of Work.
 - 6. The District will pay for utility costs associated with occupancy during construction.

1.15 PROTECTION OF EXISTING IMPROVEMENTS

- A. Provide barricades, coverings, or other types of protection necessary to prevent damage to existing improvements indicated to remain in place.
- B. Protect improvements on adjoining properties as well as those on the District's property.
- C. Protect existing trees and other vegetation indicated to remain in place, against unnecessary cutting, breaking or skinning of roots, skinning and bruising of bark, smothering of trees by stockpiling construction materials or excavated materials within drip line, excess foot or vehicular traffic, or parking of vehicles within drip line.

- D. Restore any improvements damaged by this work to their original condition as acceptable to the District or other parties or authorities having jurisdiction.

1.16 HAZARDOUS MATERIALS – NOT USED

1.17 SPECIFICATION AND DRAWING CONVENTIONS

- A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
 - 1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
 - 2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.
- B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.
- C. Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in the Specifications. One or more of the following are used on Drawings to identify materials and products:
 - 1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
 - 2. Abbreviations: Materials and products are identified by abbreviations published as part of the U.S. National CAD Standard and scheduled on Drawings.

1.18 MISCELLANEOUS PROVISIONS

- A. Items shown or scheduled to be salvaged will remain the property of the District.
- B. Rain Delays: Since the contract work will start on site during the rainy season, the Contract duration noted in Section 00 52 00 Construction Agreement Form is based on the Contractor encountering 40 work days of rain or delays due to rain (e.g., muddy conditions). The Contractor shall include 40 work days in their Baseline CPM Schedule just prior to the Substantial Completion milestone. In the event the Project is delayed at the site by rain or rain impacts beyond the 40 work days to SC, the Contractor will be entitled to a non-compensable time extension.

PART 2 – PRODUCTS - Not Used.

PART 3 – EXECUTION - Not Used.

END OF SECTION 01 11 00

SECTION 01 11 15

ADDITIONAL REQUIREMENTS FOR DSA-APPROVED PROJECTS

PART 1 - GENERAL

1.1 GENERAL

The following additional requirements apply to this Project that is being reviewed by the Division of the State Architect (DSA).

1.2 ADDITIONAL REQUIREMENTS

- A. In addition to the duties specified in the Contract Documents, the duties of the Contractor shall be in accordance with the requirements specified in, Title 24, California Code of Regulations (CCR).
- B. In addition to the duties specified in the Contract Documents, the duties of the Architect and the Architect's consultants shall be in accordance with the requirements specified in Part 1, Title 24, CCR.
- C. DSA is not subject to arbitration proceedings.
- D. Notify DSA at start of construction in accordance with Part 1, Title 24, CCR.
- E. Changes: DSA defines all addenda and change orders as Construction Change Documents (CCD.) All CCD shall be submitted for DSA approval. Do not begin any work under an CCD until DSA approval is obtained. CCDs shall be in accordance in Part 1, Title 24, CCR.
 - 1. Submit DSA 140 Form for Category A changes defined as construction changes to or affecting Structural Safety, Fire Life Safety or Accessibility.
 - 2. Submit DSA 141 Form for Category B changes defined as construction changes **NOT** affecting Structural Safety, Fire Life Safety or Accessibility.
- F. Do not begin work under a written order until a CCD has been submitted to and approved by DSA in accordance with Part 1, Title 24, CCR. Substitutions effecting structural, fire/life/safety or access compliance shall be submitted as CCDs for DSA approval. The Contractor will be responsible for the additional architectural and engineering costs associated with the review and regulatory processing of these substitutions.
- G. Unless otherwise indicated or specified, perform the work in conformance with the latest edition of applicable regulatory requirements. A copy of Part 1 and Part 2 of Title 24, CCR shall be available on the Project site. The codes adopted by the City, County, State and Federal agencies shall govern minimum requirements for this Project.
- H. Contractor shall submit verified reports in accordance with Part 1, Title 24, CCR.

- I. DSA may supervise construction, reconstruction, or repair in accordance with Part 1, Title 24, CCR.
- J. Construction shall be observed by a full-time Project Inspector approved by DSA in accordance with Part 1, Title 24, CCR.
- K. Testing requirements of the DSA approved District's Testing Laboratory shall be in accordance with Part 1, Title 24, CCR.
- L. Special Inspection on masonry construction, glued laminated lumber, wood framing using timber connectors, ready-mixed concrete, gunite, prestressed concrete, high strength steel bolt installation, welding, pile driving, and mechanical and electrical work shall be as required by Part 1, Title 24, CCR. The costs of special inspection will be paid for by the District.
- M. DSA Box: The Contractor shall comply with the most current EPR procedures. CCD's shall be submitted via Bluebeam Studio.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 11 15

**SECTION 01 14 00
WORK RESTRICTIONS**

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. All Contract Documents shall be reviewed for applicable provisions related to the provisions in this document, and provisions in the General Conditions and other Division 1 Specification Sections shall apply to this Section without limitation.

1.2 SUMMARY OF WORK RESTRICTION REQUIREMENTS

- A. Prior to the start of Work, Contractor shall familiarize itself with the Work Restrictions as they relate to all Work required by the Contract Documents.
- B. Temporary Work Activity Plan shall include:
 - 1. Full size drawing (30"x42") of site plan showing the proposed locations and dimensions of temporary facilities and activities, including but not limited to, all proposed office trailers, equipment and material storage areas on the Project Site; safe and ADA complaint access (ingress/egress) for pedestrians and vehicles around the construction areas; proposed haul routes; all temporary construction, and way-finding signage; temporary fenced area(s), noise and safety barriers, and dust partitions; and temporary measures to maintain continuous and uninterrupted code compliant use of all occupied and surrounding areas impacted by construction activities. Identify any areas that require temporary paving for stabilization or prevention of tracking of mud, and for ADA complaint ingress and egress. Indicate if the use of supplemental or other staging areas might be required. Also see Section 01 50 00 Temporary Facilities and Control for additional requirements.
 - 2. Contractor shall submit two (2) hard copies at the pre-construction meeting, and email Adobe PDF Format, of the initial submittal of the Temporary Work Activity Plan for review by the District, Architect, and by personnel from the Campus (e.g., Buildings & Grounds, Police Services, and other representatives).
- C. Contractor shall construct dust partitions and other barriers as required prior to the start of abatement or demolition activities, whichever may occur first, and they must remain in place until the completion of that activity where required.
- D. Contractor shall perform and complete all Temporary Work Activities to ensure the following:
 - 1. The work areas, roads, parking lots, and streets are to be kept clear, clean, and free of loose debris, construction materials and partially installed work which would create a safety hazard or interfere with subcontractor and personnel duties and traffic. The Contractor shall sweep the areas clean at the end of each workday and make every effort to keep dust and noise to a minimum at all times.

1.3 SUMMARY OF WORK RESTRICTIONS

- A. General:** All Temporary Work Activities must be completed within the timelines, work shift times, and the scheduled time period as required by the Contract Documents. Comply with the following:
 - 1. The Temporary Work Activity Plan shall be approved by the District prior to any Work starting on the Project Site.
 - 2. Contractor shall have all temporary fencing, signage, ADA compliant pathways and other temporary measures described in Paragraph 1.2 above installed, operational and accepted by the District prior to starting Work as applicable.

- B. Time Related Work Restrictions within the Contract Time**
 - 1. Although the Contract Time is a total of **120** calendar days between the Notice to Proceed and Final Completion, as articulated in Section 00 52 00, Construction Agreement Form, Work by the Contactor is restricted and limited to specific time periods at specific locations during this contract duration as follows:
 - 1.1. **Milestones:**
 - 1.1.1 **Substantial Completion – 120 calendar days** from the Notice to Proceed
 - 1.1.2 **Final Completion – 60 calendar days** following Substantial Completion of the Community Stadium Upgrade Project.
 - 1.1.2 **College Move** -The move period for the College is **14 calendar days** following Final Completion of the Community Stadium Upgrade Project.

 - 1.2. **All Work at the Project Site:** Work at the Project Site cannot commence any earlier than **fourteen (14) calendar days** after the District issues the Notice to Proceed, unless approved by the District.

 - 1.3. **Rain and Impacts of Rain: See Section 01 11 00, Summary of Work for related requirements to include in the Contractor’s P-6 Baseline Schedule an activity for rain and the impacts of rain on this project.**

 - 1.4. **Saturday Work:** Contractor shall include in its bid the cost to work eight hours between 8AM and 5PM for **10** Saturdays on critical and near critical path schedule activities at the Project site (i.e., near critical path schedule activities include any schedule activity with less than 5 workdays of total float). This effort includes the cost for the Contractor and its subcontractor personnel, including all field office overhead for the Contractor and the applicable subcontractors working on these **10** Saturdays (assume 6 workers, including foreman in addition to prime contractor personnel).

 - 1.5. **Sunday Work:** Contractor **CANNOT** work on Sundays or Holidays.

 - 1.6. **College Finals Week:** The **Contractor shall not perform work during Finals Week (i.e., include 5 Workdays in the schedule)** that results in the generation of noise that will disturb students taking finals. The Contractor shall submit to the District for approval the activities the Contractor may want to perform during each final’s week. Unless otherwise approved by the District/College, said work cannot be performed during Final Week(s) during the contract duration.

1.7. **Utility Shutdowns:** Utility shutdowns to be coordinated with the District so as to minimize impact to campus operations. Scheduling will depend on College operations and may require weekend work and/or backup power.

2. The Contractor is responsible for its own means and methods to comply with these work restrictions, and to submit a schedule in accordance with Section 00 70 00, Article 3.8.

C. Other Project Requirements and Restrictions

1. The Contractor’s staging area for trailers, construction vehicles, construction equipment and materials are restricted within the temporary construction fencing of the project site and the area shown on the attached **Exhibit A at the end of this Section**. Contractor shall not block the fire access road at any time within the project site or utilize for parking, staging or locating trailers. Contractor must always allow Fire District access into the project site and unobstructed use of the fire access road to other buildings on the west side of the project site. Contractor is responsible for obtaining parking passes from the Police Services.
2. **Truck Hauling Routes.** Obtain Humboldt County approval for preferred construction traffic routing over public streets and/or other construction truck access and egress from public streets to the Site. Contractor shall avoid routing trucks through residential areas.

Exhibit A:

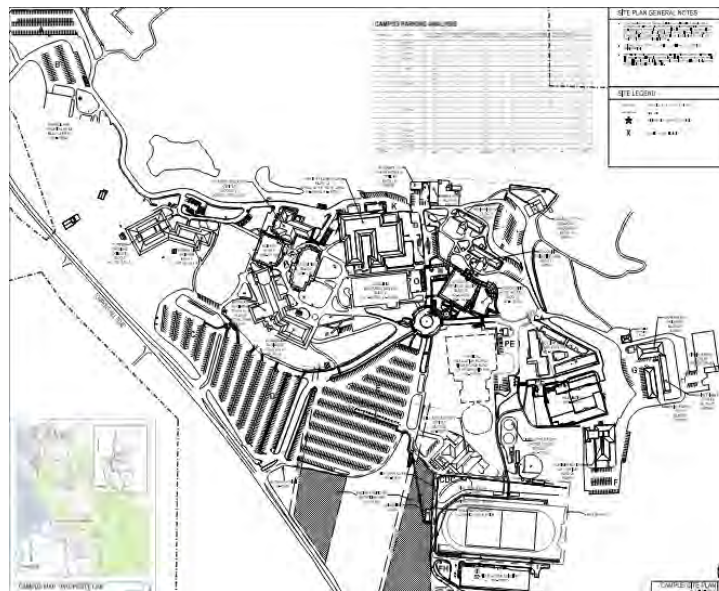


Image 1. Site Plan of Fire Truck Access

PART 2 - PRODUCTS

2.1 MATERIALS

- A. All labor, equipment, materials, and all other requirements shall be provided and will be the sole responsibility of the Contractor for execution of entire work described in this specification section.

PART 3 - EXECUTION

3.1 MEANS AND METHODS OF CONSTRUCTION

- A. Contractor to provide and shall be responsible for any and all means and methods that will be constructed, implemented and/or maintained on the site for all work described above.

END OF SECTION 01 14 00

**SECTION 01 26 00
CONTRACT MODIFICATION PROCEDURES**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. All Contract Documents shall be reviewed for applicable provisions related to the provisions in this document, and provisions in the General Conditions and other Division 1 Specification Sections shall apply to this Section without limitation.

1.2 RELATED REQUIREMENTS SPECIFIED IN OTHER SECTIONS

- A. Section 01 11 00 – “Summary of Work”
- B. Section 01 32 13 – “Scheduling of Work”
- C. Section 01 31 00 – “Project Management and Coordination”
- D. Section 01 33 00 – “Submittal Procedures”
- E. Section 01 77 00 – “Closeout Procedures”
- F. Divisions 2 through 41 Sections for Contract Modification Procedures requirements for the work in those Sections

1.3 SUMMARY

- A. Any change in scope of Work or deviation from Contract Documents including, without limitation, extra work, or alterations or additions to or deductions from the original Work, shall not invalidate the original Contract, and shall be performed under the terms and conditions of the Contract Documents.
- B. Changes in the work generally will begin with Requests for Information (RFI), followed by a response from the District and/or Architect, and possibly a Request for Proposal (RFP), a Contractor Proposed Change Order (PCO), a negotiated Proposed Change Order, followed by a formal Change Order (CO) authorizing the Change in the Work. A Construction Directive (CD) may be used in the absence of agreement on the terms of the Change in the Work.

1.4 CHANGES - No Changes Without Authorization

- A. There shall be no change whatsoever in the drawings, specifications, or in the Work without a District executed Change Order, District executed Change Directive, or District approved no cost order by the Architect for a minor change in the Work as herein provided. Changes meeting the definition of DSA Construction Change Document Category A require DSA review and approval and shall be submitted by the Architect of Record to DSA as a Construction Change Document in accordance with IR A-6.
- B. District shall not be liable for the cost of any extra work or any substitutions, changes, additions, omissions, or deviations from the Drawings and Specifications unless the District’s Governing Board has authorized the same and the cost thereof approved in writing by Change Order or executed Change Directive.

- C. No extension of time for performance of the Work shall be allowed hereunder unless claim for such extension is made at the time changes in the Work are ordered, and such time duly adjusted in writing in the Change Order.
- D. The provisions of the Contract Documents shall apply to all such changes, additions, and omissions with the same effect as if originally embodied in the Drawings and Specifications. Notwithstanding anything to the contrary in this Section, all Change Orders shall be prepared and issued by the Architect and shall become effective when executed by the District’s Governing Board, the Architect, and the Contractor.
- E. Should any Change Order result in an increase in the Contract price, the cost of such Change Order shall be agreed to, in writing, in advance by Contractor and District and be subject to the monetary limitations set forth in Public Contract Code. In the event that Contractor proceeds with any change in Work without first notifying District and obtaining the Architect’s and District’s consent to a Change Order, Contractor waives any claim of additional compensation for such additional work.

CONTRACTOR UNDERSTANDS, ACKNOWLEDGES, AND AGREES THAT THE REASON FOR THIS NOTICE REQUIREMENT IS SO THAT DISTRICT MAY HAVE AN OPPORTUNITY TO ANALYZE THE WORK AND DECIDE WHETHER THE DISTRICT SHALL PROCEED WITH THE CHANGE ORDER OR ALTER THE PROJECT SO THAT SUCH CHANGE IN WORK BECOMES UNNECESSARY.

1.5 REQUEST FOR INFORMATION (“RFI”)

- A. Definition: An RFI is a written request prepared by the Contractor requesting the Architect to provide additional information necessary to clarify or amplify an item which the Contractor believes is not clearly shown or called for in the drawings or specifications, or to address problems which have arisen under field conditions. The Contractor shall not submit an RFI to the District or the Architect if it pertains to a Subcontractor’s request for clarification of the Contractor’s Subcontract or contractor’s construction documents, or any other Contract Documents prepared by the Contractor.
- B. Scope: The RFI shall reference all the applicable Contract Documents including specification section, detail, page numbers, drawing numbers, and sheet numbers, etc. The Contractor shall make suggestions and interpretations of the issue raised by the RFI. An RFI cannot modify the Contract Cost, Contract Time, or the Contract Documents. The Contractor shall use RFI format provided by the District.
 - 1. The Contractor shall be responsible for Contractor and Subcontractor costs to implement and administer RFIs throughout the duration of the Project. The Contractor shall maintain an RFI log with all RFIs, including revisions, listed with a short description of the request, the date, the status, and the disposition of the RFI. Regardless of the number of RFIs submitted, the Contractor shall not be entitled to additional compensation.
 - 2. The Contractor shall be responsible for both the District and District consultant’s costs, including the Architect, for answering RFIs if an RFI requests an interpretation or decision of a matter where the information sought is equally available to the party making such request, as determined by the District; at the District’s discretion, such costs may be deducted from progress payments or the final payment.
 - 3. The Architect or the District may issue a Request for Proposal which includes a detailed description of a proposed change with supplementary or revised Drawings and

specifications. The Contractor shall then prepare and submit an estimate within seven (7) Calendar Days. If the Contractor fails or refuses to submit a Proposal within said seven (7) day period, the District's Representative or the District shall determine the fair and reasonable cost of the Work indicated in a Request for Proposal which shall be binding on the Contractor.

4. Supplemental Instruction or Bulletin: The Architect or the District may issue an Architect's Supplemental Instruction (ASI) or Bulletin to the Contractor.
 - a. If the Contractor is satisfied with the Supplemental Instruction or Bulletin and does not request change in Contract Sum or Contract Time, then the direction of the Work shall be executed without a Change Order.
 - b. If the Contractor believes that the Supplemental Instruction or Bulletin results in a change in Contract Sum or Contract Time, then the Contractor shall notify the District in writing within five Calendar Days after receiving the response. If the District disagrees with the Contractor, then the Contractor may give notice of intent to submit a Claim as described in the General Conditions, and submit its Claim within five Calendar Days of the District's response. If the District agrees with the Contractor, then the Contractor must submit a cost or time extension proposal within seven (7) Calendar Days of the District's response to the RFI. The Contractor's failure to deliver either the foregoing notice of Claim or proposal by the respective deadlines stated above shall result in waiver of the right to file a proposal or Claim.

- C. The Contractor shall reference each RFI to an activity of the Construction Schedule and shall note time criticality of the RFI, indicating time within which a response is required. The Contractor's failure to reference RFI to an activity on the Construction Schedule and note time criticality on the RFI shall constitute the Contractor's waiver of any claim for time delay or interruption to the Work resulting from any delay in responding to the RFI. The Contractor must submit time critical RFIs at least seven (7) Days prior to the scheduled start date of the affected Work activity.

- D. Response Time: The Architect must respond to a RFI in writing within a reasonable time, normally seven (7) days for routine RFIs, after receiving such request. If the Architect's response results in a change in the Work, then such change shall be effected by a written CO or Change Directive, if appropriate. If the Architect cannot respond to the RFI within a reasonable time, the Architect shall notify the Contractor, with a copy to the Inspector and the District, of the amount of time that will be required to respond. District or the Architect will endeavor to respond within Seven (7) working Days from receipt of RFI with a written response to the Contractor, provided that the RFI complies with the paragraph above and is determined by the Architect or District to be time critical. Failure of the Contractor to plan ahead or mitigate problems shall not be cause for a determination that an RFI is time critical. The District or the Architect may return an RFI requesting additional information should the original RFI be incomplete or inadequately describe the information requested or conditions encountered. The Contractor shall distribute responses to all appropriate Subcontractors.

- E. If the Contractor is satisfied with the response and does not request a change in Contract Sum or Contract Time, then the response shall be executed without a change.

- F. Only the Contractor and/or the District may initiate changes in the scope of Work or deviation from Contract Documents. Changes meeting the definition of DSA Construction Change

Document Category A require DSA review and approval and shall be submitted by the Architect of Record to DSA as a Construction Change Document in accordance with IR A-6.

1. Contractor may initiate changes by submitting an RFI or a letter providing Notice of Concealed or Unknown Conditions, or Notice of Hazardous Waste Conditions.
 - a. RFIs shall be submitted to seek clarification of or request changes in the Contract Documents. RFIs shall not be submitted to the District seeking clarification of any errors or omissions on behalf of the Contractor's preparation of the construction documents or any other Contract Documents prepared by the Contractor.
 - b. Differing Site Conditions: The Contractor shall submit a Notice of Differing Site Conditions by RFI to resolve problems regarding differing conditions encountered in the execution of the Work pursuant to General Conditions, which shall govern. If the District and the Architect determine that a change in Contract Sum or Contract Time is justified, the District and the Architect will issue RFP or CD.
 - c. Hazardous Waste Conditions: The Contractor shall submit Notices of Hazardous Waste Conditions by RFI to resolve problems regarding undocumented hazardous materials encountered in the execution of the Work pursuant in General Conditions, which shall govern. If the District and the Architect determine that a change in Contract Sum or Contract Time is justified, the District and the Architect will issue RFP or CD.
 2. The Contractor may submit to the Architect a written Request for Information (RFI) if one of the following conditions occurs:
 - a. Contractor discovers what appears to be an unforeseen condition or circumstance that is not described in the Contract Documents.
 - b. The Contractor discovers what appears to be a conflict or inconsistency within the Contract Documents and the intent of the Contract Documents cannot be reasonably inferred.
 - c. The Contractors discovers what appears to be an error or omission in the Contract Documents and the intent of the Contract Documents cannot be reasonably inferred.
 - d. The Contractor considers a portion of the Contract Documents is not sufficiently explained or detailed for the Contractor to proceed with that portion of the Work.
 - e. The Contractor who, after a full search of the Contract Documents and upon exercising required due diligence, fails to locate the required information.
- G. If the Contractor believes that the RFI response results in Change in the Contract Sum or the Contract Time, the Contractor shall notify the District in writing within five calendar Days after receiving the response. If the District disagrees with the Contractor, then the Contractor may give notice of intent to submit a Claim as described in General Conditions, and submit its Claim within 30 Calendar Days of the District's response. If the District agrees with the Contractor, then the Contractor must submit a cost or time extension proposal within fourteen (14) Calendar Days of the District's response to the RFI. The Contractor's failure to deliver either the foregoing notice of Claim or proposal by the respective deadlines stated above shall result in waiver of the right to file a proposal or Claim.
- H. Contractor shall identify RFIs with sequential numbering (i.e. 001, 002, 003 etc.) with a separate number assigned to each RFI. Resubmittal of apparent unresolved RFI issues shall be on a new

RFI form with the initial RFI number amended with a sequential Revision suffix (.R1, .R2, .R3 etc.) until the issue is resolved.

- I. Unless otherwise directed by the Project Manager, the Contractor shall submit each RFI on the form required by the District.
 - 1. The Contractor shall fill in all required information. Include additional information, data, sketches and the like on separate sheets as necessary; limit sheet size to 8-1/2 by 11 inches if possible. RFIs without all required information may be returned without action to the Contractor for resubmittal. Resubmittal in accordance with the specified requirements shall be the Contractors' responsibility.
 - 2. The Contractors own proposed form may be used, if in the Project Manager's judgment, it is equal to the form required by the District and it contains all pertinent information.

- J. In each request, include the following information, type or printed legibly in block letters with black ink:
 - 1. Project name as it appears on the Contract Documents
 - 2. Contractor's RFI identification number.
 - 3. Title of issue.
 - 4. Contract Document reference pertaining to the issue.
 - 5. Description of issue.
 - 6. Contractor's proposed written and graphic solution, Architect will determine if the proposal is in compliance with the Contract Documents and design intent of Project. Contractor's failure to make reasonable effort to propose realistic solutions may result in the Request for Information being returned with no action.
 - 7. Date of submission to Architect.
 - 8. Date that response is needed to avoid impact to Construction schedule and cost. Time for response shall be reasonable to allow for processing and review, research, and written response by the appropriate party.
 - 9. Urgency (normal or high).
 - 10. Justification for high urgency.
 - 11. Contractors' name and the printed name and signature of Contractors' representative responsible for issuance of request.
 - 12. Name (individual and company) of responsible for originating RFI and his or her relationship to the Contractor.
 - 13. Photographic image of condition. Furnish digital image if possible.
 - 14. Photocopy of Contract Documents or sketch of condition (with dimensions) that pertains to this issue.

- K. Limit each RFI to a single subject or issue. RFIs with multiple subject or issues may be returned to the Contractor without response. Resubmittal in accordance with the specified requirements shall be the Contractor's responsibility.

- L. Transmit each RFI to the District Project Manager as necessary to expedite the Project and to allow adequate time for review without delay to the Work. Do not transmit RFIs directly to the Architect, Architect's Consultants, or others.

- M. RFIs that do not meet the requirements of this Section will be returned to the Contractor with an explanation for its return.
- N. Inappropriate RFIs, as described hereinafter, will be returned to the Contractor with an explanation for its return but without further action:
 - 1. RFIs that are received by the Architect from an entity other than the Contractor (such as a Subcontractor, Sub-subcontractor, supplier or others.)
 - 2. RFIs that transmit or contain a request for a substitution.
 - 3. RFIs that transmit or constitute a submittal.
 - 4. RFIs that are submitted without the Contractors' thorough review of the Contract Documents or in a manner that suggests that specific portions of the Contract Documents are assumed to be excluded or taken as an isolated portion of the Contract Documents in part rather than whole.
 - 5. RFIs that are submitted in an untimely manner without adequate coordination or scheduling of the Work or related trades.
 - 6. RFIs that are submitted as a proposed or requested Change Order or other Contract Modification.
 - 7. RFIs that do not constitute a good faith request for required information.
- O. Contractor shall be responsible for resubmittal of information contained in inappropriate RFIs in accordance with the requirements of the appropriate portion of the Contract Documents.
- P. If information requested by the Contractor in an RFI is apparent from field observations, is contained in the Contract Documents, or can be reasonably inferred from them, the Contractor shall be responsible to the District for all reasonable fees charged by the Architect for additional services required to furnish such information. The amount of such additional services will be deducted from the Contractor's next payment application by the District and those funds will be forwarded to the Architect as compensation.
- Q. The quantity of RFIs submittal by the Contractor shall not be the basis for any claim by the Contractor.
- R. Should the Contractor proceed with Work affect by an RFI issue before receipt of a written response from the Architect within the time described hereinbefore, that portion of the Work not performed in accordance with the requirements of the response shall be subject to the removal and replacement by the Contractor at no increase in Contract Sum or Contract Time.
- S. Maintain a current and accurate Request for Information Log as follows:
 - 1. For each RFI, include the RFI number, subject matter, date submitted, date returned. Maintain current status of each RFI at all times.
 - 2. Submit log weekly and as requested by Project Manager or Architect.
 - 3. Accurately maintain log for the duration of the Contract.

1.6 REQUEST FOR PROPOSAL ("RFP")

- A. Definition: An RFP is a written request prepared by the Architect requesting the Contractor to submit to the District and the Architect an estimate of the effect of a proposed change on the Contract Price and the Contract Time.

- B. Scope: An RFP shall contain adequate information, including any necessary drawings and specifications, to enable Contractor to provide the cost breakdowns required by this Specification Section. The Contractor shall not be entitled to any Additional Compensation for preparing a response to an RFP, whether ultimately accepted or not. Changes meeting the definition of DSA Construction Change Document Category A require DSA review and approval and shall be submitted by the Architect of Record to DSA as a Construction Change Document in accordance with IR A-6.
- C. District Requested RFP: The Contractor shall furnish a proposal within fourteen (14) Calendar Days of the District's RFP. Upon approval of RFP, the District will issue a PCO directing the Contractor to proceed with the extra Work. If the parties do not agree on the price for an RFP, the District may issue a CD. Upon receipt of CD, the Contractor shall promptly proceed with the change of Work involved and concurrently respond to the District's CD within seven (7) Calendar Days. The Contractor shall perform the changed Work notwithstanding any claims or disagreements of any nature.

1.7 PROPOSED CHANGE ORDER (PCO) REQUEST

- A. Definition: A PCO is a written request prepared by the Contractor requesting that the District and the Architect issue a CO based upon a proposed change called for in an RFP or a claim pursuant to the General Conditions. Changes meeting the definition of DSA Construction Change Document Category A require DSA review and approval and shall be submitted by the Architect of Record to DSA as a Construction Change Document in accordance with IR A-6.
- B. Changes in Price: A PCO shall include breakdowns per this specification section to validate any change in Contract Price due to proposed change or claim.
- C. Changes in Time: A PCO shall also include any additional time required to complete the Project. Any additional time requested shall not be the number of days to make the proposed change, but must be based upon the impact to the Project Schedule as defined in the Construction Scheduling Specifications of these Contract Documents. Any changes in time will be granted only if there is an impact to the critical path. If contractor fails to request a time extension in a PCO, then the Contractor is thereafter precluded from requesting or claiming a delay.
- D. The Contractor may propose changes by submitting a Proposed Change Order (PCO form, see section 01 31 40) to the District's Representative, describing the proposed change and its full effect on the Work. The Contractor shall include a statement describing the reason for the change and the effect on the Contract Sum and Contract Time with full documentation including detailed cost and schedule breakout, and a statement describing the effect on Work by separate or other the Contractors. Document any requested substitutions in accordance with the Contract Documents. Cost for Work in approved PCOs shall not be applied for by the Contractor or paid by the District until the PCOs are included in a Change Order (CO form, see section 01 31 40)
- E. Cost Proposal and Procedures: Whenever the Contractor is required in this Section to prepare a Proposed Change Order form (PCO), and whenever the Contractor is entitled to submit a cost proposal and elects to do so, the Contractor shall prepare and submit to the District and the Architect for consideration a proposal using the PCO form found in the Contract Documents, or other similarly prepared form previously approved by the District. All cost proposals must contain detailed line-item backup with a complete breakdown of costs for credits, deducts and extras, which itemizes materials, labor, equipment, taxes, overhead and profit. All

Subcontractor Work shall be so indicated. Subcontractor quotes for any subcontractor tier submitted as lump sum or without the required line-item breakdown will be rejected. After receipt of a proposal with a detailed breakdown, the District and the Architect will act promptly thereon.

1. If the District and the Architect approves a proposal, the PCO will be routed for Contractor signatures, the District Representative signatures, and the District signature.
2. If a proposal is not acceptable to the District or the Architect because it does not agree with costs and/or time included in the proposal, the District or the Architect will submit in a response what it believes to be a reasonable cost and/or adjustment, if any. Except, as otherwise provided in this Section, the Contractor shall have five Calendar Days in which to respond to the District with a revised proposal.
3. When necessity to proceed with a change does not allow the District sufficient time to conduct a proper cost and schedule analysis of a proposal (or revised proposal), the District may direct the Contractor to proceed on a basis to be determined at earliest practical date. In this event, the value of the Change, with corresponding equitable adjustment to Contract, shall not be more than the increase or less than the decrease initially proposed.

1.8 CHANGE ORDERS (“CO”)

A Change Order is a written instrument prepared by the Architect and signed by the District (as authorized by the District’s Governing Board), the Contractor, the Architect, and the DSA (if necessary), stating their agreement upon all of the following:

- A. A description of a change in the Work;
- B. The amount of the adjustment in the Contract Sum, if any; and
- C. The extent of the adjustment in the Contract Time, if any.
- D. Change Order Forms: Whether or not noted on the executed form of Change Order, all Change Orders approved by the District are deemed to include and incorporate the following provision:

“The adjustment of the Contract Price and the Contract Time for the changes noted in a Change Order (the “Changes”) represents the full and complete adjustment of the Contract Price and the Contract Time due the Contractor for providing and completing such Changes, including without limitation: (i) all costs (whether direct or indirect) for labor, equipment, materials, tools, supplies and/or services; (ii) all general and administrative costs (including without limitation, home office, field office, and Site General Conditions costs) and profit; and (iii) all impacts, delays, disruptions, interferences or hindrances in providing and completing the Changes. (iv) bond and insurance. The Contractor waives all rights, including without limitation, those arising under Civil Code Section 1542, for any other adjustment of the Contract Price or the Contract Time on account of a Change Order or the performance and completion of the Changes.”
- E. Correlation of Other Items
 1. Contractor shall promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as a separate line item and adjust the Contract Sum as shown on the Change Order prior to the last day of the next monthly pay period.

2. Within seven (7) days, Contractor shall promptly revise Progress schedules, look ahead schedules, and the Contractors Master Schedule to reflect any Change in Contract Time, revise sub schedules to adjust times for other items of work affected by the change and resubmit to the District for review and approval. The Contractors shall not make changes to tasks in any schedule not impacted by the Change.
3. Contractor is responsible to promptly enter Changes in Project Record Documents.

F. All Changes:

1. Documentation of Change in Contract Sum and Contract Time:
 - a. Contractor shall maintain detailed records of all Work performed on a time-and-material basis.
 - b. Contractor shall document each proposal for a change in cost or time with sufficient data to allow detailed line item evaluation and analysis of the proposal.
 - c. Contractor shall, on request, provide additional data to support computations for:
 - i) Quantities of products, materials, labor and equipment.
 - ii) Taxes, auto insurance, and bonds.
 - a) Costs associated with the onsite work under general liability, workers compensation, pollution liability and builders' risks shall not be allowed; unless approved by the District.
 - iii) Overhead and profit.
 - iv) Justification for any change in Contract Time and new Progress Schedule showing revision due, if any. Justification for change shall comply with Scheduling of Work Section 01 32 13.
 - v) Credit for deletions from Contract, similarly documented.
 - d. Contractor shall support each claim for additional costs and for Work performed under Force Account with additional information including:
 - i) Credit for deletions from Contract, similarly documented.
 - ii) Origin and date of claim.
 - iii) Dates and times Work was performed and by whom.
 - iv) Time records and wage rates paid.
 - v) Invoices and receipts for products, materials, equipment and subcontracts, similarly documented.

G. COST OF CHANGE ORDERS

1. It is the responsibility of the Contractor to notify the District within five Calendar Days if there is a cost change related to a change in the Work. Notification beyond this time limit may result in future claims being time barred.
2. Within seven (7) Calendar days after a request is made for a change that impacts the Contract Sum, the critical path, or the Contract Time, the Contractor shall provide the District and the Architect, with a written estimate of the effect of the proposed CO upon the Contract Sum and the actual cost of construction, which shall include a complete itemized cost breakdown of all labor and material showing actual quantities, hours, unit prices, and wage rates required for the change, and the effect upon the Contract Time of

such CO. Changes may be made by District by an appropriate written CO, or, at the District’s option, such changes shall be implemented immediately upon the Contractor’s receipt of an appropriate written Change Directive.

3. District may, as provided by law and without affecting the validity of this Agreement, order changes, modification, deletions and extra work by issuance of written CO or Change Directives from time to time during the progress of the Project, contract sum being adjusted accordingly. All such work shall be executed under conditions of the original Agreement except that any extension of time caused thereby shall be adjusted at time of ordering such change. District has discretion to order changes on a “time and material” basis with adjustments to time made after Contractor has justified through documentation the impact on the critical path of the Project.
4. The amount of the increase or decrease in the Contract Price from a CO, if any, shall be determined in one or more of the following ways as applicable to a specific situation:
 - a. Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation. If an agreement cannot be reached within fifteen (15) days after submission and negotiation of Contractor’s proposal, Contractor may submit a properly formatted claim per the General Conditions and this Specification Section. Submission of sums which have no basis in fact are at the sole risk of Contractor and may be a violation of the False Claims Act set forth under Government Code Section 12650 et. seq.);
 - b. By unit prices contained in Contractor’s original bid and incorporated in the Project documents or fixed by subsequent agreement between District and Contractor;
 - c. Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee. However, in the case of disagreement, Contractor must utilize the procedure under this Specification Section; or
 - d. By cost of material and labor and percentage of overhead and profit. (Force Account)

H. COST DETERMINATION

1. Total cost of extra Work or of Work omitted shall be the sum of construction labor costs, material costs, equipment rental costs, as defined herein plus overhead and profit as allowed herein and by the General Conditions. This limit applies in all cases of claims for extra Work, whether calculating cost proposals, Change Orders or CDs, or calculating claims of all types, and applies even in the event of fault, negligence, strict liability, or tort claims of all kinds, including strict liability or negligence. The Contractor may recover no other costs arising out of or connected with the performance of extra Work, of any nature. No special, incidental or consequential damages may be claimed or recovered against the District, its representatives or agents, whether arising from breach of contract, negligence or strict liability, unless specifically authorized in the Contract Documents.
2. Application of Overhead and Profit: (Overhead shall be as defined in this Specification Section.)
 - a. Total overhead and profit on labor for extra Work shall not exceed 15 percent.
 - b. Total overhead and profit on materials for extra Work shall not exceed 15 percent.
 - c. Total overhead and profit on equipment for extra Work shall not exceed 10 percent.

- d. When extra Work is performed by a first tier Subcontractor the Contractor shall receive a 5 percent markup on Subcontractors’ total costs of extra Work. First tier Subcontractor’s markup on its Work shall not exceed 15 percent.
 - e. When extra Work is performed by a lower tier Subcontractor, the Contractor shall receive a total of 5 percent markup on the lower tier Subcontractors’ total costs of extra Work. First tier Subcontractors and lower tier Subcontractors shall divide the 15 percent markup as mutually agreed.
 - f. Notwithstanding the foregoing, in no case shall the total markup on any extra Work exceed 20 percent of the direct cost, notwithstanding the actual number of contract tiers.
 - g. On proposals covering both increases and decreases in Contract Sum, overhead and profit shall be allowed on the net increase only as determined in paragraph 1.5 above. When the net difference is a deduction, no percentage for overhead and profit shall be allowed, but rather the deduction shall apply.
 - h. No markup will be allowed on permits, fees, insurance, and bonds.
- I. Taxes: All State sales and use taxes, Humboldt County and applicable City sales taxes, shall be included. Federal and Excise tax shall not be included.
- J. Accord and Satisfaction: Every Change Order and accepted CD shall constitute a full accord and satisfaction, and release, of all the Contractor (and if applicable, Subcontractor) claims for additional time, money or other relief arising from or relating to the subject matter of the change including, without limitation, impacts of all types, cumulative impacts, inefficiency, overtime, delay and any other type of claim. The Contractor may elect to reserve its rights to disputed claims arising from or relating to the changed Work at the time it signs a Change Order or approves a CD, but must do so expressly in a writing delivered concurrently with the executed Change Order or approved CD, and must also submit a Claim for the reserved disputed items pursuant to the General Conditions no later than 30 Calendar Days of the Contractor’s first written notice of its intent to reserve rights.
- K. COST BREAKDOWN
- 1. Labor: The Contractor will be paid cost of labor for workers (not including the project superintendent, or forepersons unless forepersons work greater than 50% of the time and then only when authorized by the District), used in actual and direct performance of extra Work. Labor rate, whether employer is the Contractor, Subcontractor or other forces, will be sum of following:
 - a. Actual Wages: Actual wages paid shall include any employer payments to or on behalf of workers for health and welfare, pension, vacation, and similar purposes.
 - b. Labor surcharge: Payments imposed by local, county, state, and federal laws and ordinances, and other payments made to, or on behalf of, workers, other than actual wages such as taxes and worker’s compensation insurance. Contractor to provide backup for any labor surcharges falling under this category.
 - c. If agreement cannot be reached between the District and Contractor, or its subcontractors regarding labor productivity rates then Saylor Publications Current Construction Costs, which is in effect on date upon which extra work is performed, and which is incorporated herein by reference, shall be used to determine rates and surcharges. Unless accepted in writing by the District’s Representatives, other

manuals, including NECA (National Electrical Contractors Association) manual, shall NOT be used as a basis to determine labor rates, labor productivity rates, labor surcharges, or any other costs.

2. Material: Only materials furnished and installed in the Work by the Contractor and necessarily used in performance of extra Work will be paid for. The Contractor and any and all subcontractors will submit proof of material cost satisfactory to the District when requested. Cost of such materials will be cost, including sales tax, to purchaser (Contractor, Subcontractor or other forces) from supplier thereof, except as the following are applicable:
 - a. If cash or trade discount by actual supplier is offered or available to purchaser, it shall be credited to the District notwithstanding fact that such discount may not have been taken.
 - b. For materials salvaged upon completion of extra Work, salvage value of materials shall be deducted from cost, less discounts, of materials.
 - c. If cost of a material is, in opinion of the District, excessive, then cost of material shall be deemed to be lowest current wholesale price at which material is available in quantities concerned delivered to Site, less any discounts as provided in this Specification Section.

Unless accepted in writing by the District's Representative, NECA (National Electrical Contractors Association) manual shall NOT be used as a basis to determine any material costs.

3. Equipment Rental: For the Contractor-owned or Subcontractor-owned equipment, payment will be made at rental rates listed for equipment in California Department of Transportation official equipment rental rate schedule which is in effect on date upon which extra Work is accomplished and which schedule is incorporated herein by reference as though fully set forth herein.
 - a. If there is no applicable rate for an item of equipment, then payment shall be made for the Contractor- or Subcontractor-owned equipment at rental rate listed in the most recent edition of the Association of Equipment Distributors (AED) book.
 - b. For rented equipment, payment will be made based on actual rental invoices. Equipment used on extra Work shall be of proper size and type. If, however, equipment of unwarranted size or type and cost is used, cost of use of equipment shall be calculated at rental rate for equipment of proper size and type, as determined by the District.
 - c. Rental rates paid shall be deemed to cover cost of fuel, oil, lubrication, supplies, small tools, necessary attachments, repairs and maintenance of any kind, depreciation, storage, insurance, and all incidentals. Unless otherwise specified, manufacturer's ratings, and manufacturer-approved modifications, shall be used to classify equipment for determination of applicable rental rates.
 - d. Individual pieces of equipment or tools not listed in said publication and having a replacement value of \$250 or less, whether or not consumed by use, shall be considered to be small tools and no payment will be made therefore as payment is included in payment for labor.
 - e. Rental time will not be allowed while equipment is inoperative due to breakdowns.

- f. For equipment on Site, rental time to be paid for equipment shall be time equipment is in operation on extra Work being performed or on standby as approved by the District. The following shall be used in computing rental time of equipment:
 - i) When hourly rates are listed, less than 30 minutes of operation shall be considered to be ½ hour of operation.
 - ii) When daily rates are listed, less than four hours of operation shall be considered to be ½ Day of operation.
 - g. For equipment that must be brought to Site to be used exclusively on extra Work, cost of transporting equipment to Site and its return to its original location shall be determined as follows:
 - i) District will pay for costs of loading and unloading equipment.
 - ii) Cost of transporting equipment in low bed trailers shall not exceed hourly rates charged by established haulers.
 - iii) Cost of transporting equipment shall not exceed applicable minimum established rates of California Public Utilities Commission.
 - iv) District will not make any payment for transporting and loading and unloading equipment if equipment is used on Work in any other way than upon extra Work.
 - h. Rental period may begin at time equipment is unloaded at Site of extra Work and terminate at end of the performance of the extra Work or Day on which the District directs the Contractor to discontinue use of equipment, whichever first occurs. Excluding Saturdays, Sundays, and the District's legal holidays, unless equipment is used to perform extra Work on such Days, rental time to be paid per Day shall be four hours for zero hours of operation, six hours for four hours of operation and eight hours for eight hours of operation, time being prorated between these parameters. Hours to be paid for equipment that is operated less than eight hours due to breakdowns, shall not exceed eight less number of hours equipment is inoperative due to breakdowns.
4. Work Performed by Special Forces or Other Special Services: When the District, the Architect and the Contractor by agreement, determine that special service or item of extra Work cannot be performed by forces of the Contractor or those of any Subcontractors, service or extra Work item may be performed by specialists. Invoices for service or item of extra Work on basis of current market price thereof may be accepted without complete itemization of labor, material, and equipment rental costs when it is impracticable and not in accordance with established practice of the special service industry to provide complete itemization. In those instances wherein the Contractor is required to perform extra Work necessitating a fabrication or machining process in a fabrication or machine shop facility away from Site, charges for that portion of extra Work performed in such facility may, by agreement, be accepted as a specialist billing. The District must be notified in advance of all off-Site Work. In lieu of overhead and profit provided in this Section, 15 percent will be added to specialist invoice price, after deduction of any cash or trade discount offered or available, whether or not such discount may have been taken.

L. FORCE-ACCOUNT WORK

If it is impracticable because of nature of Work, or for any other reason, to fix an increase or decrease in price definitely in advance, the Contractor may be directed to proceed at a not-to-exceed (NTE) maximum price which shall not under any circumstances be exceeded. Subject to such limitation, such extra Work shall be paid for at actual necessary cost for Force-Account Work or at the negotiated cost, as determined by the District. The cost for Force-Account Work shall be determined pursuant to this Specification Section.

1. Force-Account Work shall be used when it is not either possible or practical to price the changed Work prior to the start of that Work. In these cases, Force-Account Work will be utilized during the pricing and negotiation phase of the change. Once negotiations have been concluded and a bilateral agreement has been reached, the tracking of the Work under Force-Account is no longer necessary. Force-Account Work shall also be used when negotiations between the District and the Contractor have broken apart and a bilateral agreement on the value of the changed Work cannot be reached. The District may approve other uses of Force-Account Work.
2. Whenever any Force-Account Work is in progress, definite price for which has not been agreed on in advance, the Contractor shall report to the District each Business Day in writing in detail amount and cost of labor, equipment, and material used, and any other expense incurred in Force-Account Work on the preceding day, by using a preapproved cost proposal form. No claim for compensation for Force-Account Work will be allowed unless report shall have been made and acknowledged by the District.
3. Whenever Force-Account Work is in progress, definite price for which has not been agreed on in advance, the Contractor shall report to the District when 75 percent of the NTE amount has been expended.
4. RECORDS AND CERTIFICATION
 - a. Force-Account (cost reimbursement) charges shall be recorded daily and summarized in preapproved cost proposal form. The Contractor or authorized representative shall complete and sign form each Day and submit to the District Representative for review and approval. The Contractor shall also provide with the form: the names and classifications of workers and hours worked by each; an itemization of all materials used; a list by size type and identification number of equipment and hours operated; and an indication of all Work performed by specialists.
 - b. No payment for Force-Account Work shall be made until the Contractor submits original invoices substantiating materials and equipment charges.
 - c. District shall have the right to audit all records in possession of the Contractor relating to activities covered by the Contractor’s claims for modification of Contract, including Force-Account Work and CD Work.
 - d. Further, the District will have right to audit, inspect, or copy all records maintained in connection with this Contract, including financial records, in possession of the Contractor relating to any transaction or activity occurring or arising out of, or by virtue of, the Contract. If the Contractor is a joint venture, right of the District shall apply collaterally to same extent to records of joint venture sponsor, and of each individual joint venture member. This right shall be specifically enforceable, and any failure of the Contractor to voluntarily comply shall be deemed an irrevocable

waiver and release of all claims then pending that were or could have been subject to the General Condition of Contract.

5. Force-Account Work shall be paid as extra Work under this Section. Methods of determining payment for Work and materials provided in this paragraph shall not apply to performance of Work or furnishings of material that, in judgment of the District, may properly be classified under items for which prices are otherwise established in Contract Documents.
 - a. Basis for Establishing Costs.
 - i) Labor will be the actual cost for wages prevailing locally for each craft or type of workers at the time the extra Work is done, plus employer payments of payroll taxes and insurance, worker’s compensation, health and welfare, pension, vacation, apprenticeship funds, and other direct costs resulting from Federal, State, or local laws, as well as assessments or benefits required by lawful collective bargaining agreements. The use of a labor classification which would increase the extra Work cost will not be permitted unless the Contractor establishes the necessity for such additional costs. Labor costs for equipment operators and helpers shall be reported only when such costs are not included in the invoice for equipment rental.
 - ii) Materials shall be at invoice or lowest current price at which such materials are locally available and delivered to the Site in the quantities involved, plus sales tax, freight, and delivery. The District reserves the right to approve materials and sources of supply or to supply materials to the Contractor if necessary for the progress of the Work. No markup shall be applied to any material provided by the District.
 - iii) Tool and Equipment Rental. No payment will be made for the use of tools which have a replacement value of \$250 or less.
 - b. Other Items. The District may authorize other items which may be required on the extra work. Such items include labor, services, material, and equipment which are different in their nature from those required by the Work, and which are of a type not ordinarily available from the Contractor or any of the Subcontractors. Invoices covering all such items in detail shall be submitted with the request for payment.
 - c. Invoices. Vendors’ invoices for material, equipment rental, and other expenditures shall be submitted with the PCO. If the request for payment is not substantiated by invoices or other documentation, the District may establish the cost of the item involved at the lowest price which was current at the time of the Daily Report.
 - d. Overhead and Profit. Overhead and profit is defined and shall be applied as in this Specification Section.

M. DISTRICT-FURNISHED MATERIALS

1. District reserves right to furnish materials, as it deems advisable, and the Contractor shall have no claims for costs and overhead and profit on such materials.

N. OVERHEAD DEFINED

1. The following includes, but is not limited to, costs that are deemed included in overhead for all Contract Modifications, including COs, Force-Account Work or CD Work, whether

incurred by the Contractor, Subcontractors, or suppliers, and the Contractor shall not invoice or receive payment for these costs separately:

- a. Drawings: field drawings, Shop Drawings, etc., including submissions of drawings.
 - b. Routine field inspection of Work proposed.
 - c. General Superintendence, including Site Superintendent, Project Engineers, Project Management or Construction Management services provided by the Contractor.
 - d. General administration and preparation of cost proposals, schedule analysis, change orders and other supporting documentation as necessary.
 - e. Computer services.
 - f. Reproduction services.
 - g. Salaries of, superintendent, foremen, timekeeper, storekeeper and secretaries
 - h. Janitorial services
 - i. Temporary on Site facilities, including for any extended periods of Contract Time:
 - i) Offices
 - ii) Telephones
 - iii) Plumbing
 - iv) Electrical: Power, lighting, etc.
 - v) Platforms
 - vi) Fencing, barricades, signage, etc.
 - vii) Water
 - 2. Home office expenses
 - 3. Procurement and use of vehicles and fuel used coincidentally in Work otherwise included in the Contract Documents
 - 4. Surveying
 - 5. Estimating
 - 6. Protection of Work
 - 7. Handling and disposal fees
 - 8. Final cleanup
 - 9. Small tools
 - 10. Warranty
 - 11. All Contract General Conditions
 - 12. Other incidental Work
- O. Deductive Change Orders: All deductive Change Order(s) shall be prepared in the same manner as additive change orders using the same forms and formulas, with negative numbers. Overhead and profit will be neither added nor deducted when calculating deductive changes.
- P. Discounts, Rebates, and Refunds: For purposes of determining the cost, if any, of any change, addition, or omission to the Work hereunder, all trade discounts, rebates, refunds, and all returns from the sale of surplus materials and equipment shall accrue and be credited to the Contractor, and the Contractor shall make provisions so that such discounts, rebates, refunds,

and returns may be secured, and the amount thereof shall be allowed as a reduction of the Contractor’s cost in determining the actual cost of construction for purposes of any change, addition, or omissions in the Work as provided herein.

- Q. Accounting Records: With respect to portions of the Work performed by COs and Change Directives on a time-and-materials, unit-cost, or similar basis, the Contractor shall keep and maintain cost-accounting records satisfactory to the District, which shall be available to the District on the same terms as any other books and records the Contractor is required to maintain under the Contract Documents.
- R. Notice Required: If the Contractor desires to make a claim for an increase in the Contract Price, or any extension in the Contract Time for completion, it shall notify the District pursuant to the General Conditions of these Contract Documents. Contractor shall proceed to execute the Work even though the adjustment may not have been agreed upon. Any change in the Contract Price or extension of the Contract Time resulting from such claim shall be authorized by a CO.
- S. Applicability to Subcontractors: Any requirements under this Section shall be equally applicable to COs or Change Directives issued to Subcontractors by the Contractor to the same extent required by the Contractor.
- T. Alteration to Change Order Language: Contractor shall not alter or reserve time in Change Orders or Change Directives. Contractor shall execute finalized Change Orders and proceed with the Work. If Contractor intends to reserve time, without an approved CPM schedule prepared pursuant to the Construction Scheduling Specification, the Contractor may be prosecuted pursuant to the False Claim Act.

1.9 CHANGE DIRECTIVE

- A. Definition: A Change Directive is a written order prepared by the District and signed by the Architect and District, directing a change in the Work and stating a proposed basis for adjustment, if any, in the Contract Sum or Contract Time, or both. The District may, by Change Directive and without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions, or other revisions within. If applicable, the Contract Sum and Contract Time will be adjusted accordingly. In the case of a Change Directive being issued, Contractor shall commence Work immediately or delays from failure to perform Change Directive shall be the responsibility of Contractor. Any dispute as to the sum of Change Directive or timing of payment, shall be resolved pursuant to the Disputes paragraphs of these Contract Documents. A Change Directive shall be used in the absence of agreement on the terms of a CO. Changes meeting the definition of DSA Construction Change Document Category A require DSA review and approval and shall be submitted by the Architect of Record to DSA as a Construction Change Document in accordance with IR A-6.
- B. Change Directives: If at any time the District believes in good faith that a timely Change Order will not be agreed upon using the foregoing procedures, the District may issue a CD with a recommended cost and/or time adjustment.
 - 1. Upon receipt of CD, the Contractor shall promptly proceed with the change of Work involved and concurrently respond to the District’s CD within 10 Calendar Days.
 - a. Contractor’s response must be any one of following:
 - i) Return CD signed, thereby accepting the District’s response, time, and cost.

- ii) Submit a (revised if applicable) proposal with supporting documentation (if applicable, reference original proposal number followed by letter R1, R2, etc. for each revision.
 - iii) Give notice of intent to submit a Claim as described in the General Conditions, and submit its Claim with 30 Calendar Days.
 - b. If the CD provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:
 - i) Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation.
 - ii) Unit prices stated in the Contract Documents or subsequently agreed upon.
 - iii) Force account.
 - iv) Cost to be determined in a manner agreed.
 - C. A CD signed by the Contractor indicates the agreement of the Contractor therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a PCO.
 - D. If the Contractor does not respond promptly, or disagrees with the method for adjustment in the Contract Sum, the method and the adjustment shall be determined by the District on the basis of published estimating guides, District or Architect estimating consultant analysis, or reasonable and historical expenditures and savings of those performing similar Work including, in case of an increase in the Contract Sum, a reasonable allowance for overhead and profit. If the parties still do not agree on the price for a CD, the Contractor may file a Claim per General Conditions. The Contractor shall keep and present, in such form as the District may prescribe, an itemized accounting together with appropriate supporting data.
 - E. The amount of credit to be allowed by the Contractor for a deletion or change which results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Architect and the District. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.
- 1.10** Responses: For all responses for which the Contract Documents, including without limitation this Section, do not provide a specific time period, recipients shall respond within a reasonable time.
- 1.11** Disputes: For all disputes arising from the procedures herein, the Contractor shall follow this Section and the Contract General Conditions.

PART 2 – PRODUCTS

Not used.

PART 3 – EXECUTION

Not used.

END OF SECTION 01 26 00

**SECTION 01 29 00
PAYMENT PROCEDURES**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. All Contract Documents shall be reviewed for applicable provisions related to the provisions in this document, and provisions in the General Conditions and other Division 1 Specification Sections shall apply to this Section without limitation.

1.2 RELATED REQUIREMENTS SPECIFIED IN OTHER SECTIONS

- A. Section 01 11 00 – “Summary of Work”
- B. Section 01 26 00 – “Contract Modification Procedures”
- C. Section 01 31 19 – “Project Meetings”
- D. Section 01 32 15 – “Scheduling of Work”
- E. Section 01 33 00 – “Submittal Procedures”
- F. Section 01 77 00 – “Closeout Procedures”
- G. Section 01 78 39 – “Project Record Documents”
- H. Divisions 2 through 41 Sections for Payment Procedures requirements for the work in those sections.

1.3 SUMMARY

- A. This Section includes descriptions of requirements and procedures for determining the quantity of Work performed during each pay period in project and the procedures for obtaining payment for Work performed.

1.4 CONTRACT SUM

- A. The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable by the District to the Contractor for performance of the Work under the Contract Documents.

1.5 SCHEDULE OF VALUES

- A. Within ten (10) calendar days of the award of the Contract, provide an Initial Schedule of Values (SOV) along with the Initial CPM Schedule. This initial SOV shall include detailed breakdown of the elements of work expected in the first 90 calendar days of the Contract.
- B. Submit the Master Schedule of Values for all activities and costs under the Contract. Coordinate activities with, and submit this Master SOV at the same time as the cost and resource loaded master CPM Schedule.
- C. The SOV shall include Contractor’s overhead, profit, insurance, cost of bonds (except to the extent expressly identified in a Proposal Item) and/or other financing, as well as general

conditions costs, (e.g., Site cleanup and maintenance, temporary roads, access, signage off-Site access roads, temporary power and lighting, security, and the like). These costs shall be prorated through all activities and all Phases of the Project so that the sum of all Schedule of Values line items equals the total Contract Sum.

- D. District, Architect, and Project Manager shall review the breakdown in conjunction with the Master Construction Schedule to ensure that the amounts listed in the Schedule of Values are, in fact, fair market cost allocations for the Work items listed. Upon favorable review by the District, District will accept this Schedule of Values for use. District shall be the sole judge of fair market cost allocations.
- E. District will reject any attempt to increase the cost of early activities, i.e., “front loading,” resulting in a complete reallocation of moneys until such “front loading” is corrected. Repeated attempts at “front loading” may result in suspension or termination of the Work for default, or refusal to process progress payments until such time as the Schedule of Values is acceptable to District.
- F. The Schedule of Values shall list line item costs for Project Closeout, Operations and Maintenance Manuals, Warranties, final test reports, and like items as required by this and other sections of the Contract Documents.
- G. Format and Content: Use the Project Manual Table of Contents as a guide to establish line items for the Schedule of Values. Provide at least one line item for each Specification Section.
 - 1. Identification: Include the following Project Identification on the Schedule of Values:
 - a. Project name and Campus;
 - b. Name of Architect;
 - c. District’s project number;
 - d. Contractor’s name and address;
 - e. Date of submittal.
 - 2. Arrange the Schedule of Values in tabular form with separate columns to indicate the following for each item listed:
 - a. Related Specification Section or Division;
 - b. Description of the Work;
 - c. Name of subcontractor;
 - d. Name of manufacturer or fabricator;
 - e. Name of supplier;
 - f. Change Orders (numbers) that affect value;
 - g. Dollar value:
 - i) Percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.

Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the Project Manual Table of Contents, individual Specification Sections, and the Construction Schedule. Provide several line items for principal subcontract amounts, where appropriate. Include separate

line items under required principal subcontracts. A line item for Bonds must be supported by the evidence of the Bond cost at the time of application for payment. Provide individual line items for operation and maintenance manuals, punch list activities, Project Record Documents, Title 24 closeout, LEED commissioning (if applicable), and demonstration and training (if applicable). If the values for administrative close-out items are not realistic and supportable, the Schedule of Values will not be accepted.

3. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
4. Provide a separate line item in the Schedule of Values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
 - a. Differentiate between items stored on-site and items stored off-site. If specified, include evidence of insurance or bonded warehousing.
5. Provide separate line items in the Schedule of Values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
6. Provide separate line item in the Schedule of Values for maintenance and updating of Project Record Documents as specified in Section 01 78 39 (Project Record Documents).
7. Provide a separate line item for DSA verified report retention if this is a DSA approved project. See General Conditions.
8. Allowances: Provide a separate line item in the Schedule of Values for each allowance.
9. Each item in the Schedule of Values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.
10. Schedule Updating: When Change Orders result in a change in the Contract Sum, include each Change Order as a new line item, with additional line items for detail if the change involves multiple subcontractors or significant Work in more than one Specification Section.

1.6 SUBCONTRACTOR LISTING

- A. Within five (5) days of the award of the Contract, provide the name, address, telephone number, fax number, California State Contractors Board License number, and classification of all Subcontracts for parties furnishing labor, material, or equipment for the Project.

1.7 DISTRICT APPROVAL

- A. The District shall review all submittals required above in a timely manner. All submittals must be approved by the District before becoming the supporting basis for any Contractor payment request.

1.8 PROGRESS PAYMENTS

- A. Within thirty (30) days after approval of the Request for Payment, Contractor shall be paid a sum equal to ninety percent (95%) of the value of the Work performed (as certified by Architect and Inspector and verified by Contractor) up to the last day of the previous month, less the aggregate of previous payments. The value of the Work completed shall be Contractor’s best estimate. No inaccuracy or error in said estimate shall operate to release the Contractor, or any surety upon any bond, from damages arising from such Work, or from the District’s enforcement of each and

- every provision of this Contract, and the District shall have the right subsequently to correct any error made in any estimate for payment.
- B. The Contractor shall not be entitled to have any payment requests processed, or be entitled to have any payment made for work performed, so long as any lawful or proper direction given by the District concerning the Work, or any portion thereof, remains incomplete.
 - C. Notwithstanding anything to the contrary stated above, the Contractor may include in its Request for Payment the value of any structural steel, G.F.R.C. panels and other such custom-made materials prepared specifically for the Project and unique to the Project so long as all of the following requirements are satisfied:
 - 1. No payment shall be made for materials stored off-site without the written approval of the District to be given or withheld in the District's sole discretion;
 - 2. Title to such materials shall be vested in the District as evidenced by documentation satisfactory in form and substance to the District, including, but not limited to, recorded financing statements, UCC filings and UCC searches;
 - 3. With each Contractor Request for Payment, the Contractor shall submit to the District a written list identifying each location where materials are stored off-site (which must be a bonded warehouse) and the value of the materials at each location. The Contractor shall procure insurance satisfactory to the District (in its reasonable discretion) for materials stored off-site in an amount not less than the total value thereof;
 - 4. The consent of any Surety shall be obtained to the extent required prior to payment for any materials stored off-site;
 - 5. Representatives of the District shall have the right to make inspections of the storage areas at any time; and
 - 6. Such materials shall be (1) protected from diversion, destruction, theft and damage to the reasonable satisfaction of the District; (2) specifically marked for use on the Project; and (3) segregated from other materials at the storage facility.
 - D. The Contractor is required to order, obtain, and store materials and equipment sufficiently in advance of its Work at no additional cost or advance payment from District to assure that there will be no delays.
 - E. No payment by District hereunder shall be interpreted so as to imply that District has inspected, approved, or accepted any part of the Work. Notwithstanding any payment, the District may enforce each and every provision of this Contract. The District may correct any error subsequent to any payment.

1.9 APPLICATIONS FOR PROGRESS PAYMENTS

- A. The Architect shall, within seven (7) days after receipt of the Contractor's Application for Payment, either approve such payment or notify the Contractor in writing of the Architect's reasons for withholding approval in whole or in part as provided herein. The review of the Contractor's Application for Payment by the Architect is based on the Architect's observations at the Site and the data comprising the Application for Payment that the Work has progressed to the point indicated and that, to the best of the Architect's knowledge, information, and belief, the quality of the Work is in accordance with the Contract Documents.

- B. The foregoing representations are subject to:
1. An evaluation of the Work for conformance with the Contract Documents;
 2. Results of subsequent tests and inspections;
 3. Minor deviations from the Contract Documents correctable prior to completion, and
 4. Specific qualifications expressed by the Architect. The issuance of a Certificate for Payment will further constitute a representation that the Contractor is entitled to payment in the amount certified.
- C. Progress Payment Procedures include the following:
1. *Pre-application Meeting.* On or before the 5th Day of each calendar month during the progress of the Work, Contractor shall attend a pre-Application meeting with District's Representatives, including the Architect, Project Manager and Project Inspector. Contractor shall provide a complete draft of the proposed Application for Payment for review. The Contractor shall revise and resubmit the draft Application for Payment, if required by District.
 2. *Application for Progress Payment.* On or before the tenth (10th) day of each calendar month during the progress of the Work, Contractor shall submit to the Architect an itemized Application for Progress Payment for operations completed in accordance with the Schedule of Values. Such application shall be notarized, if required, and supported by the following and as required by the specifications.
 3. The Contractor shall submit Applications for Payment in a form pre-approved by the District, either on or following the format of AIA G702/G703. Information shall include:
 - a. The amount paid to the date of the Application to the Contractor, to all its Subcontractors, and all others furnishing labor, material, or equipment for its Contract;
 - b. The amount being requested under the Application for Payment by the Contractor on its own behalf and separately stating the amount requested on behalf of each of the Subcontractors and all others furnishing labor, material, and equipment under the Contract;
 - c. The balance that will be due to each of such entities after said payment is made;
 - d. A certification that the Record Drawings and Annotated Specifications are current;
 - e. Itemized breakdown of work done for the purpose of requesting partial payment;
 - f. Where the Work is separated into Phases, provide Applications for Payment showing values correlated with each Phase separately.
 - g. An updated Construction Schedule in conformance with the requirements of Section 01 32 13, Scheduling of Work.
 - h. All additions to and subtractions from the Contract Price and Contract Time;
 - i. A summary of the retentions held;
 - j. Material invoices, evidence of equipment purchases, rentals, and other support and details of cost as the District may require;
 - k. An updated Schedule of values showing percentage of completion of the Contractor's Work by line item.

- D. Prerequisites for Progress Payments include the following:
 - 1. The following items must be submitted and approved before the first payment request will be accepted for processing:
 - a. List of all subcontractors;
 - b. List of Contractor’s staff assignments;
 - c. Installation of the Project signs and other required temporary facilities and controls, including field office(s) required by Section 01 50 00;
 - d. Complete Schedule of Values;
 - e. Initial Construction Schedule, due within [10] days after Notice to Proceed;
 - f. Submittal Schedule;
 - g. Copies of any required permits;
 - h. Copies of authorizations and licenses from governing authorities, if required;
 - i. Surveyor qualifications if needed;
 - j. All bonds and insurance endorsements;
 - k. Other early submittals required by the Contract Documents.
- E. No payment requests will be processed unless Contractor has:
 - 1. Submitted copies of the Certified Payroll records for the Payment Request Work period.
 - 2. Provided an updated Construction Schedule showing amounts due based on the completion percentages, cost and resource loaded data for activities.
 - 3. Provided an updated Schedule of Values.
 - 4. Provided all other payment request related items required by the Contract Documents.
- F. Payment requests that are not in compliance with the Contract Documents will be returned with no action taken.
- G. If Contractor is late submitting an Application for Payment, that Application may be processed at any time during the one-month period, but may result in processing of the Contractor’s Application for Payment being delayed for more than a day-for-day basis. The District and its representative shall not be responsible for any such Payment being delayed due to late, incomplete, or inaccurate submission by the Contractor.
- H. Any payments made to Contractor where criteria set forth in the Contract Documents have not been met shall not constitute a waiver of said criteria by District. Instead, such payment shall be construed as a good faith effort by District to resolve differences so Contractor may pay its Subcontractors and suppliers and that Contractor agrees that failure to submit such items may constitute a breach of contract by Contractor and may subject Contractor to termination or other penalty.

1.10 WARRANTY OF TITLE

- A. The Contractor warrants title to all work. The Contractor further warrants that all work is free and clear of liens, claims, security interests, or encumbrances in favor of the Contractor,

Subcontractors, material and equipment suppliers, or other persons or entities making a claim by reason of having provided labor, materials, and equipment relating to the Work.

- B. Failure to keep work free of liens, claims, security interests or encumbrances is grounds to make a claim against Contractor's payment and performance bond to immediately remedy and defend.
- C. If a lien or stop notice of any nature should at any time be filed against the Work or any District property by any entity which has supplied material or services at the request of the Contractor, Contractor and Contractor's surety shall promptly, on demand by District and at Contractor's and surety's own expense, take any and all action necessary to cause any such lien or stop notice to be released or discharged immediately therefrom.
- D. If the Contractor fails to furnish to the District within ten (10) calendar days after demand by the District, satisfactory evidence that a lien or stop notice has been so released, discharged, or secured, then District may discharge such indebtedness and deduct the amount required therefor, together with any and all losses, costs, damages, and attorney's fees and expense incurred or suffered by District from any sum payable to Contractor under the Contract.

1.11 DECISIONS TO WITHHOLD PAYMENT

- A. The District may withhold payment, in whole, or in part, to such extent as may be necessary to protect the District from loss because of, but not limited to:
 - 1. Defective Work not remedied;
 - 2. Stop Notices served upon the District;
 - 3. Liquidated damages assessed against the Contractor;
 - 4. The cost of completion of the Contract if there exists reasonable doubt that the Work can be completed for the unpaid balance of any Contract Price or by the completion date;
 - 5. Damage to the District or other contractor;
 - 6. Unsatisfactory prosecution of the Work by the Contractor;
 - 7. Failure to store and properly secure materials;
 - 8. Failure of the Contractor to submit on a timely basis, proper and sufficient documentation required by the Contract Documents, including, without limitation, acceptable monthly progress schedules, shop drawings, submittal schedules, schedule of values, product data and samples, proposed product lists, executed Change Order, Construction Change Directives, and verified reports;
 - 9. Failure of the Contractor to maintain record drawings;
 - 10. Erroneous estimates by the Contractor of the value of the Work performed, or other false statements in an Application for Payment;
 - 11. Unauthorized deviations from the Contract Documents;
 - 12. Failure of the Contractor to prosecute the Work in a timely manner in compliance with established progress schedules and completion dates.
 - 13. Failure to properly pay prevailing wages as defined in Labor Code section 1720, et seq.;
 - 14. Failure to properly maintain or clean up the Site;
 - 15. Payments to indemnify, defend, or hold harmless the District;

- 16. Any payments due to the District including but not limited to payments for failed tests, or utilities changes or permits;
- 17. Failure to submit an acceptable schedule in accordance with Section 01310;
- 18. Failure to pay Subcontractor or suppliers as required herein;
- 19. Failure to provide release from material suppliers or subcontractors when requested to do so.

1.12 RE-ALLOCATION OF WITHHELD AMOUNTS

- A. District may, in its discretion, apply any withheld amount to payment of outstanding claims or obligations as defined in herein. In so doing, District shall make such payments on behalf of Contractor.
- B. If any payment is so made by District, then such amount shall be considered as a payment made under Contract by District to Contractor and District shall not be liable to Contractor for such payments made in good faith. Such payments may be made without prior judicial determination of claim or obligation. District will render Contractor an accounting of such funds disbursed on behalf of Contractor.
- C. If Contractor defaults or neglects to carry out the Work in accordance with the contract documents or fails to perform any provision thereof, District may, after ten (10) calendar days written notice to the Contractor and without prejudice to any other remedy make good such deficiencies.
- D. The District shall adjust the total Contract price by reducing the amount thereof by the cost of making good such deficiencies. If District deems it inexpedient to correct Work which is damaged, defective, or not done in accordance with Contract provisions, an equitable reduction in the Contract price (of at least 150% of the estimated reasonable value of the nonconforming work) shall be made therefore.

1.13 PAYMENT AFTER CURE

- A. When the grounds for declining approval are removed, payment shall be made for amounts withheld because of them. No interest shall be paid on any retainage or amounts withheld due to the failure of the Contractor to perform in accordance with the terms and conditions of the Contract Documents.

1.14 NONCONFORMING WORK

- A. Contractor shall promptly remove from premises all Work identified by District as failing to conform to the Contract whether incorporated or not. Contractor shall promptly replace and re-execute its own Work to comply with the Contract without additional expense to District and shall bear the expense of making good all work of other contractors destroyed or damaged by such removal or replacement.
- B. If Contractor does not remove such Work which has been identified by District as failing to conform to the Contract Documents within a reasonable time, fixed by written notice, District may remove it and may store the material at Contractor's expense. If Contractor does not pay expenses of such removal within ten (10) calendar days' time thereafter, District may, upon ten (10) calendar days' written notice, sell such materials at auction or at private sale and shall

account for net proceeds thereof, after deducting all costs and expenses that should have been borne by Contractor.

1.15 SUBCONTRACTOR PAYMENTS

- A. No later than ten (10) days after receipt, or pursuant to Business and Professions Code Section 7108.5 and Public Contract Code section 7107, the Contractor shall pay to each Subcontractor, out of the amount paid to the Contractor on account of such Subcontractor’s portion of the Work, the amount to which said Subcontractor is entitled. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner.

1.16 NO OBLIGATION OF DISTRICT FOR SUBCONTRACTOR PAYMENT

- A. The District shall have no obligation to pay, or to see to the payment of, money to a Subcontractor except as may otherwise be required by law.

1.17 PAYMENT NOT CONSTITUTING APPROVAL OR ACCEPTANCE

- A. An approved Request for Payment, a progress payment, or partial or entire use or occupancy of the Project by the District shall not constitute acceptance of Work not in accordance with the Contract Documents.

1.18 JOINT CHECKS

- A. District shall have the right, if necessary for the protection of the District, to issue joint checks made payable to the Contractor and Subcontractors and material or equipment suppliers. The joint check payees shall be responsible for the allocation and disbursement of funds included as part of any such joint payment. In no event shall any joint check payment be construed to create any contract between the District and a Subcontractor of any tier, any obligation from the District to such Subcontractor, or rights in such Subcontractor against the District.

1.19 NO WAIVER

- A. Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

1.20 FINAL PAYMENT

- A. Contractor shall comply with requirements of Section 01 77 00 Closeout Procedures.
- B. Contractor shall maintain the presence of Project Superintendent and Project Manager until the Work is complete.
- C. Under no circumstances shall Contractor demobilize its forces prior to completion of the Final Punchlist. Upon receipt of Contractor’s written notice that all of the Final Punchlist items have been fully completed and the Work is ready for final inspection and acceptance, Architect shall inspect the Work and shall submit to Contractor and District a final inspection report noting which work, if any, is required to be completed in accordance with the Contract Documents. Absent unusual circumstances, this report shall consist of the Punchlist items not yet satisfactorily completed.

- D. Upon completion of the Work contained in the Final Inspection report, the Contractor shall notify the District and Architect, who shall again inspect such Work. If the Architect and the District finds the Work contained in such Final Inspection report acceptable under the Contract Documents and, therefore, the Work fully completed, it shall notify Contractor, who may then submit to the Architect its final Application for Payment.
- E. Upon receipt and approval of such final Application for Payment, the Architect shall issue a final Certificate of Payment stating that to the best of its knowledge, information, and belief, and on the basis of its observations, inspections, and all other data accumulated or received by the Architect in connection with the Work, such Work has been completed in accordance with the Contract Documents. The District shall thereupon inspect such Work and either accept the Work as complete or notify the Architect and the Contractor in writing of reasons why the Work is not complete. Upon acceptance of the Work of the Contractor as fully complete (which, absent unusual circumstances, will occur when the Punch List items have been satisfactorily completed), the District shall record a Notice of Completion with the County Recorder, and the Contractor shall, upon receipt of payment from the District, pay the amounts due Subcontractors.
- F. The following conditions must be fulfilled prior to Final Payment:
 - 1. A full and final waiver or release of all Stop Notices in connection with the Work shall be submitted by Contractor, including a release of Stop Notice in recordable form, together with (to the extent permitted by law) a copy of the full and final release of all Stop Notice rights.
 - 2. The Contractor shall have made all corrections to the Work required to remedy any defects therein, to obtain compliance with the Contract Documents or any requirements of applicable codes and ordinances, or to fulfill any of the orders or directions of District.
 - 3. Each Subcontractor shall have delivered to the Contractor all written guarantees, warranties, applications, and bonds required by the Contract Documents for its portion of the Work.
 - 4. Contractor must have completed all requirements set forth in Section 01 77 00 Closeout Procedures.
 - 5. Architect shall have reviewed and approved a Final Application for Payment.
 - 6. The Contractor shall have completed final clean up as required by Section 01 74 00 Cleaning and Waste Management.

1.21 RETAINAGE

- A. The retainage, less any amounts disputed by the District or which the District has the right to withhold, shall be paid:
 - 1. After approval by District and Architect of the Contractor’s final Application for Payment;
 - 2. After satisfaction of all terms and conditions set forth in the Contract Documents, and
 - 3. After thirty-five (35) days after the acceptance of the Work by the District Governing Board and recording of the Notice of Completion by District.
- B. No interest shall be paid on any retainage, or on any amounts withheld due to a failure of the Contractor to perform in accordance with the terms and conditions of the Contract Documents,

except as provided to the contrary in any Escrow Agreement between the District and the Contractor pursuant to Public Contract Code § 22300.

1.22 SUBSTITUTION OF SECURITIES

- A. The District will permit the substitution of securities in accordance with the provisions of Public Contract Code § 22300.

1.23 ALLOWANCES (NOT USED)

PART 2 – PRODUCTS

Not Used.

PART 3 – EXECUTION

Not Used.

END OF SECTION 01 29 00

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**SECTION 01 30 01
LABOR COMPLIANCE PROGRAM**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. All Contract Documents shall be reviewed for applicable provisions related to the provisions in this document, and provisions in the General Conditions and other Division 0 and Division 1 Specification Sections shall apply to this Section without limitation.

1.2 RELATED REQUIREMENTS SPECIFIED IN OTHER SECTIONS

- A. Section 01 11 00 – “Summary of Work”
- B. Section 01 29 00 – “Payment Procedures”
- C. Section 01 77 00 – “Closeout Procedures”
- D. Divisions 2 through 41 Sections for Labor Compliance Program requirements for the work in those Sections.

1.3 SUMMARY

- A. Labor Code Section 1725.5 regarding Department of Industrial Relations (DIR) contractor registration process including registration criteria and implementation of DIR registration requirements. Labor Code Section 1771.7 establishes contractor’s obligation to submit Certified Pay Roll (CPR) to the Department of Labor and Standards Enforcement (DLSE) and public works monitoring and enforcement. Labor Code Section 1773.3 requires the District to submit a PWC-100 to DIR for all public works contract awarded effective January 1, 2015.
- B. Contractors and subcontractors performing work on District projects will be expected to adhere to the labor compliance provisions outlined in Division 2, Part 7, Chapter 1 of the California Labor Code §1720- 1861 including, but not limited to, the reporting of certified payroll, payment of prevailing wages and the employment of apprentices.

1.4 LABOR COMPLIANCE PROGRAM REQUIREMENTS

- A. California Labor Code Section 1770, et seq., and Education Code Section 17424 require that contractors on Public works projects pay their workers based on the prevailing wage rates which are established and issued by the Department of Industrial Relations, Division of Labor Statistics and Research.
 - 1. Pursuant to the provisions of Division 2, Part 7, Chapter 1, Article 2 of the California Labor Code §1770, et seq., the District has obtained from the Director of the California Department of Industrial Relations the general prevailing rate of per diem wages and the prevailing rate for straight time, holiday time and overtime work in the locality in which the work is to be performed for each craft, classification or type of worker needed to execute the contract. The prevailing wage determination can be accessed online at <http://www.dir.ca.gov/dlsr/DPreWageDetermination.htm>. Copies of the prevailing rate of per diem wages are also on file at the District office, which shall be made available to any interested party on request. Per diem wages shall be deemed to include employer payments for health and welfare, pensions, vacation, travel time and subsistence pay as pr

vided in California Labor Code §1773.1 and as shown in the Director's determination. For apprenticeship or other training programs authorized by California Labor Code §3093, and similar purposes, when the term "per diem wages" is used herein it shall have the meaning as defined in the prevailing wage determination as published by the Director of the California Department of Industrial Relations and California Labor Code.

2. The contractor shall post at an appropriate conspicuous weatherproof point on the site of the project a copy of the prevailing wage determination published by the Director of the California Department of Industrial Relations which is applicable to the project and the Notice of Approval of the Labor Compliance Program.
3. There shall be paid to each worker of the contractor or any subcontractor, of any tier, engaged in the work, not less than the general prevailing wage rate regardless of any contractual relationship which may be alleged to exist between the contractor or any subcontractor, of any tier, and such worker. The contractor and subcontractors will be required to pay all workers on a weekly basis. Each worker needed to execute the work on the project shall also be paid travel and subsistence payments, as such travel and subsistence payments are defined in the prevailing wage determination published by the Director of the California Department of Industrial Relations.
4. Holiday and overtime work, when permitted by law, shall be paid for at the rate identified in the prevailing wage determination issued by the Director of the California Department of Industrial Relations. In accordance with Labor Code §1815, work performed by employees of contractors in excess of 8 hours per day, and 40 hours during any one week, shall be permitted upon public work upon compensation for all hours worked in excess of 8 hours per day at not less than 1 1/2 times the basic rate of pay.
5. The Contractor shall forfeit fifty dollars (\$50.00) for each calendar day or portion thereof, for each worker paid less than the prevailing rates as determined by the Director of the California Department of Industrial Relations for such work or craft in which such worker is employed by the contractor or by any subcontractor, of any tier, in connection with the work. Pursuant to California Labor Code §1775, the difference between such prevailing wage rates and the amount paid to each worker for each calendar day, or portion thereof, for which each worker was paid less than the prevailing wage rate, shall be paid to each worker in the addition to the penalties. The amount of forfeiture shall be determined by the Labor Commissioner and shall be based on consideration of the contractor's mistake, inadvertence, or neglect in failing to pay the correct rate of prevailing wages. The contractor's previous record in meeting the prevailing wage obligations or the contractor's willful failure to pay the correct rates of prevailing wages may influence the amount of penalty.
6. In accordance with Labor Code §1813, the contractor or subcontractor shall, as a penalty to the state or political subdivision on whose behalf the contract is made or awarded, forfeit twenty-five dollars (\$25) for each worker employed in the execution of the contract by the respective contractor or subcontractor for each calendar day during which the worker is required or permitted to work more than 8 hours in any one calendar day and 40 hours in any one calendar week in violation of the provisions of this article. In awarding any contract for public work, the awarding body shall cause to be inserted in the contract a stipulation to this effect. The awarding body shall take cognizance of all violations of this article committed in the course of the execution of the contract, and shall report them to the Division of Labor Standards Enforcement.

- B. California Labor Code Section 1776 requires contractors to keep accurate payroll records of trade workers on all public works projects and to submit copies of certified payroll records upon request.
1. Pursuant to California Labor Code §1776, the contractor and every subcontractor, of any tier, shall keep accurate payroll records, showing the name, address, social security number, work classification, straight time and overtime hours worked each day and week, and the actual per them wages paid to each journeyman, apprentice, worker or other employee employed by them in connection with the public works project. The payroll records shall be certified and submitted bi-weekly to the Labor Compliance Representative and shall be available for inspection at all reasonable hours at the principal office of the Contractor on the following basis:
 2. A certified copy of an employee’s payroll record shall be made available for inspection or furnished to such employee or his/her authorized representative on request;
 3. A certified copy of all payroll records shall be made available for inspection or furnished upon request to the District, the Division of Labor Standards Enforcement and the Division of Apprenticeship Standards of the Department of Industrial Relations;
 4. A certified copy of payroll records shall be made available upon request to the public for inspection or copies thereof made; provided, however, that a request by the public shall be made through the District, the Division of Apprenticeship Standards, or the Division of Labor Standards Enforcement. The contractor shall have ten (10) days in which to completely comply, subsequent to receipt of written notice specifying in what respects the contractor must comply herewith. Should noncompliance be evident after such 10-day period, the contractor shall, as a penalty to the District, forfeit Twenty-Five Dollars (\$25.00) for each calendar day, or portion thereof, for each worker, until strict compliance is effectuated.
- C. California Labor Code Section 1777.5 requires contractors to employ registered apprentices on Public works projects.
1. Per California Labor Code §1777.5(e), the contractor and all subcontractors shall notify an approved training program that can supply apprentices to the area of the public works project. The contractor and subcontractors shall submit contract award information to the applicable joint apprenticeship committee which shall include an estimate of journeyman hours to be performed under the contract, the number of apprentices to be employed, and the approximate dates the apprentices will be employed. Additionally, the contractor and subcontractors shall request, from the joint apprenticeship committee, dispatch of apprentices on the public works project using the state form DAS-142.
 2. All apprentices employed by the contractor to perform any of the work shall be paid the prevailing wages identified by the Director of the California Department of Industrial Relations. Only apprentices, as defined in California Labor Code §3077 who are in training under apprenticeship standards and written apprenticeship agreements under California Code §§3070, et seq., are eligible to be employed for the work. The employment and training of each apprentice shall be in accordance with the provisions of the apprenticeship standards and apprentice agreements under which such apprentice is training or the standards established by the Division of Apprenticeship Standards.
 3. The ratio of work performed by apprentices to journeymen, who shall be employed in the work, may be the ratio stipulated in the apprenticeship standards under which the joint apprenticeship committee operates, but in no case shall the ratio be less than one hour (1) of apprentice work for each five (5) hours of labor performed by a journeyman, except as

otherwise provided in California Labor Code §1777.5. Any ratio shall apply during any day or portion of a day when any journeyman, or the higher standard stipulated by the joint apprenticeship committee, is employed at the site of the Work and shall be computed on the basis of the hours worked during the day by journeymen so employed, except for the surveyor classification. The Contractor shall employ apprentices for the number of hours computed as above before the completion of the work. The contractor shall, however, endeavor, to the greatest extent possible, to employ apprentices during the same time period that the journeymen in the same craft or trade are employed at the site of the Work. Where an hourly apprenticeship ratio is not feasible for a particular craft or trade, the Division of Apprenticeship Standards, upon application of a joint apprenticeship committee, may order a minimum ratio of not less than one apprentice for each five journeymen in a craft or trade classification. This article shall not apply to contracts of general contractors, or to contracts of specialty contractors not bidding for work through a general or prime contractor, involving less than thirty thousand dollars (\$30,000).

4. The contractor or any subcontractor, of any tier, who performs any of the work by employment of journeymen or apprentices in any apprenticeable craft or trade and who is not contributing to a fund or funds to administer and conduct the apprenticeship program in any such craft or trade in the area of the site of the work, to which fund or funds other contractors in the area of the site of the work are contributing, shall contribute to the fund or funds in each craft or trade in which it employs journeymen or apprentices in the same amount or upon the same basis and in the same manner as the other contractors do, but where the trust fund administrators are unable to accept such funds, contractors not signatory to the trust agreement shall pay a like amount to the California Apprenticeship Council. The contractors shall provide proof of such contributions when requested, including checks, check stubs, receipts, or other records required to prove that all required payments were made.
5. In the event the contractor willfully fails to comply with the provisions of California Labor Code §1777.5, and pursuant to California Labor Code §1777.7, the contractor shall: (i) be denied the right to bid on any public works contract for a period of one (1) year from the date the determination of non-compliance is made by the administrator of apprenticeship; and (ii) forfeit, as a civil penalty, one hundred dollars (\$100.00) and up to three hundred dollars (\$300.00) for each calendar day of noncompliance. The District shall withhold such amount from the contract price then due or to become due upon request of the Division of Apprenticeship Standards.

END OF SECTION 01 30 01

SECTION 01 31 00

PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. All Contract Documents shall be reviewed for applicable provisions related to the provisions in this document, and provisions in the General Conditions and other Division 1 Specification Sections shall apply to this Section without limitation.

1.2 RELATED REQUIREMENTS SPECIFIED IN OTHER SECTIONS

- A. Section 01 11 00 – “Summary of Work”
- B. Section 01 14 00 – “Work Restrictions”
- C. Section 01 31 19 – “Project Meetings”
- D. Section 01 33 00 – “Submittal Procedures”
- E. Section 01 45 29 – “Testing Laboratory Services”
- F. Section 01 35 00 – “Special Procedures”
- G. Section 01 74 00 – “Cleaning and Waste Management”
- H. Section 01 77 00 – “Closeout Procedures”
- I. Section 01 79 00 – “Demonstration & Training”
- J. Divisions 2 through 41 Sections for Project Management and Coordination requirements for the work in those Sections.

1.3 SUMMARY

- A. This Section specifies the administrative requirements and includes descriptions of required Project Coordination for the work and all phases of Project including, but not limited to, the following:
 - 1. Coordination
 - 2. Pre-Construction Conference
 - 3. Project Meetings
 - 4. Pre-installation Conferences-Coordination
 - 5. Underground and Utilities Coordination
 - 6. Electrical and Mechanical Coordination
 - 7. Coordination with Work by District
 - 8. Special Meetings-Coordination
 - 9. Coordination of Contract Closeout

1.4 COORDINATION

- A. Coordinate scheduling, submittals, and Work of the various Sections of Specifications to assure efficient and orderly sequence of Work, with provisions for accommodating items to be installed later and for accommodating items to be installed by other District Contractors.
- B. Resolve differences or disputes concerning coordination, interference, or extent of Work of the various Sections of the Specifications. Contractor's decisions if consistent with requirements of the Contract Documents shall be final.
- C. Coordinate completion and clean-up of Work of separate Sections in preparation for substantial Completion.
- D. Coordinate requests for substitutions to assure compatibility of space, of operating elements, and effect on work of other sections.
- E. Coordinate sequence of Work to accommodate District occupancy as specified within the Contract Documents. Cooperate with District and District suppliers and/or contractors during move-in and occupancy of the completed Work at each Phase.
- F. Contractor shall coordinate construction operations and means and method of construction included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections that depend on each other for proper installation, connection, and operation.
 - 1. Coordinate structural, mechanical, and electrical elements prior to installation. All penetrations of structural elements must first receive approval of Architect and District. Rerouting of ductwork, piping, or conduit and resulting changes to other work caused by failure to coordinate beforehand is the responsibility of the Contractor and shall not be considered justification for either additional cost or time.
 - 2. Schedule construction operations in sequence required to obtain the best constructed results where installation of one part of the Work depends on installation of other components, before or after its own installation.
 - 3. Coordinate installation of different components with other contractors or other trades to ensure maximum and appropriate accessibility for required maintenance, service, and repair. Where availability of space is limited, coordinate installation of different components to ensure maximum and appropriate performance and accessibility for required maintenance, service, operations, and repair of all components, and building systems.
 - 4. Make adequate provisions to accommodate items scheduled for later installation.
 - 5. The manner in which the Specifications are divided into Divisions and Sections is not intended to indicate division of work between trades nor indicate trade union or jurisdictional agreements. Requests for an increase in the Contract Price or Time for Work indicated in one area of the Specifications or Drawings that are not correlated with Work indicated in other areas of the Specifications or Drawings before Bidding will be denied by the District.
 - a. Assign and subcontract construction activities, and employ workers in a manner that will not risk jurisdictional disputes that could result in conflicts, delays, claims, or losses.

1.5 PRECONSTRUCTION CONFERENCE

- A. The District will schedule a conference after Notice to Proceed and prior to the start of Work.
- B. Attendance Required: District representatives, Architect and consultants, DSA Project Inspector, District Representative, Contractor, certain Subcontractors as requested by the District and others as appropriate.

1.6 ADMINISTRATIVE COORDINATION

- A. Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative coordination activities include, but are not limited to, the following:
 - 1. Preparation of and coordination of Contractor’s CPM Schedules Preparation of the Schedule of Values and Master CPM Schedule
 - 2. Coordinate installation and removal of temporary facilities and controls
 - 3. Coordinate and delivery and processing of submittals, and samples
 - 4. Coordinate progress meetings, testing, and inspection
 - 5. Pre-installation conferences
 - 6. Mockups
 - 7. Startup and adjustment of systems
 - 8. Project closeout activities
- B. Project Documents Management and Exchange
 - 1. The Contractor, District, IOR, and Architect shall mutually utilize an internet-based system for the exchange and tracking of Project documents. See Specification Section 01 31 80 Document Management Systems

1.7 PRE-INSTALLATION CONFERENCES AND COORDINATION

- A. Contractor shall be responsible to convene pre-installation conferences as required by individual Section of the Specifications. Include all affected parties. Also refer to Section 01 31 19 for additional Project Meetings requirements.

1.8 COORDINATION OF THE WORK

- A. Coordinate use of project space and sequence of installation of mechanical, electrical, structural, and other Work which is indicated diagrammatically on Drawings. Follow routings shown for pipes, ducts, and conduits as closely as practicable, with due allowance for available physical space; make runs parallel with lines of building. Utilize space efficiently for maximum and appropriate accessibility for other installations, for maintenance, service, operations, and for repairs.
- B. Contractor shall use large scale drawings, if their preparation is required as part of Work of these specifications, together with shop drawings and layout drawings of other affected sections of these specifications to check, to coordinate, and to integrate the Work of various sections to prevent interferences.

- C. Perform and complete checking and coordination before commencing construction in the affected areas.
- D. In finished areas, except as otherwise shown, conceal pipes, ducts, and wiring in the construction. Coordinate locations of plumbing, fixtures, electrical fixtures, and fixtures and outlets with finish elements.

1.9 CONSERVATION

- A. Contractor shall coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials.
 - 1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. Refer to other Sections for disposition of salvaged materials that are designated as District’s property.

1.10 MEANS AND METHODS

- A. Contractor is solely responsible for construction means, methods, techniques, sequences, and procedures for performing all Work.

1.11 COORDINATION KEY PERSONNEL NAMES

- A. Contractor prior to starting construction operations shall submit a list of key personnel assignments, including Contractor’s Project Manager, Superintendent, Assistant Superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including office and cell telephone numbers. Provide names, addresses, and telephone numbers of individuals assigned as standbys in the absence of individuals assigned to Project.
 - 1. Contractor shall submit ten (10) copies of key personnel list to the District.
 - 2. Post copies of list in Project meeting room, in temporary field office, and by each temporary telephone. Keep list current at all times, and provide current list to the District.

1.12 ADMINISTRATIVE AND SUPERVISORY PERSONNEL

- A. Contractor shall provide other administrative and supervisory personnel as required for proper performance of the Work.
 - 1. Include specific or dedicated personnel required for coordination of operations with other contractors.

1.13 COORDINATION WITH WORK BY DISTRICT

- A. Coordinate service connections for District furnished and District installed equipment. Verify that service connections are correct sizes and in required locations.
- B. Coordinate support and anchorage for equipment furnished and installed by the District. Provide blocking and backing as shown or directed to facilitate installation of equipment by others.

1.14 DAILY CONSTRUCTION REPORTS

- A. On a daily basis, Contractor shall submit a daily activity report to DISTRICT for each workday, including weekends and holidays, when worked. Contractor shall develop the daily construction reports on a computer generated data-base capable of sorting daily Work, manpower and man-hours by Contractor, Subcontractor, area, sub area, and change order work. Upon request of DISTRICT, furnish computer disk of this database. Obtain DISTRICT's written approval of daily construction report data base format prior to implementation. Include in report:
 - 1. Project name and Project number
 - 2. Contractor's name and address
 - 3. Weather, temperature and any unusual site conditions
 - 4. Brief description and location of the day's scheduled activities and any special problems and accidents, including Work of Subcontractors. Descriptions shall be referenced to CPM scheduled activities.
 - 5. Worker quantities for its own Work force and for Subcontractors of any tier.
 - 6. Equipment, other than hand tools, utilized by Contractor and Subcontractors.

1.15 PERIODIC VERIFIED REPORTS

- A. The Contractor shall complete and submit the Final Verified Report required by DSA In addition to other conditions precedent to Final Payment, the Contractor's completion and submission of the Final Verified Report is an express condition precedent to the District's obligation to make the Final Payment. In addition to completion and submission of the Final Verified Report, as a material obligation under the Contract Documents, the Contractor shall comply will all DSA requests for reports or other data relating to the Work, the status thereof or conformity of the Work to the Contract Documents.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

Not Used.

END OF SECTION 01 31 00

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**SECTION 01 31 19
PROJECT MEETINGS**

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. All Contract Documents shall be reviewed for applicable provisions related to the provisions in this document, and provisions in the General Conditions and Division 1 Specification Sections shall apply to this Section without limitation.

1.2 RELATED REQUIREMENTS SPECIFIED IN OTHER SECTIONS

- A. Section 01 11 00 – “Summary of Work”
- B. Section 01 14 00 – “Work Restrictions”
- C. Section 01 45 00 – “Quality Control”
- D. Section 01 50 00 – “Temporary Facilities and Control”
- E. Section 01 77 00 – “Closeout Procedures”
- F. Divisions 2 through 41 Sections for Project Meetings requirements for the work in those Sections.

1.3 SUMMARY

- A. This Section specifies administrative requirements and provides descriptions of the required project meetings for the Work and all phases of the project. These meetings include, but not limited to, the following:
 - 1. Preconstruction Meeting
 - 2. Schedule Review Meetings
 - 3. Weekly Project Progress Meetings
 - 4. Progress Schedule and Application for Payment Meetings
 - 5. Special Meetings

1.4 PRECONSTRUCTION CONFERENCE

- A. District will schedule and conduct the Preconstruction Conference at a time and place to be determined.
- B. Contractor and all major subcontractors shall attend the Preconstruction Conference. This includes, but is not limited to, the following:
 - 1. Demolition Subcontractor
 - 2. Structural Steel Subcontractor
 - 3. Mechanical Subcontractor
 - 4. Electrical Subcontractor
 - 5. Plumbing Subcontractor
 - 6. Hazardous Material Abatement Subcontractor

- C. Meeting agenda will include, but is not limited to, discussion of the following items:
1. Schedules
 2. Personnel and vehicle permit procedures
 3. Use of premises
 4. Location of Contractor's on-Site facilities
 5. Security
 6. Housekeeping
 7. Submittal and RFI procedures
 8. Inspection and testing procedures, on-Site and off-Site
 9. Utility shutdown procedures
 10. Control and reference point survey procedures
 11. Injury and Illness Prevention Program
 12. Initial Schedule
 13. Schedule of Values
 14. Schedule of Submittals
 15. Project Directory
 16. Emergency Contact List

1.5 SCHEDULE OF VALUES and initial schedule MEETING

- A. Contractor shall meet with District and Architect within 10 days of submittal of the initial Schedule of Values and Initial CPM Schedule to review and evaluate the Schedule of Values and the Initial CPM Schedule.

1.6 SHOP DRAWINGS & SUBMITTALS SCHEDULE MEETING

- A. Contractor shall meet with District and Architect within 10 days of submittal of the draft Shop Drawings and Submittals Schedule to review and evaluate the Shop Drawings and Submittals Schedule.

1.7 WEEKLY PROGRESS MEETINGS

- A. Weekly Progress Meetings will be scheduled throughout duration of Work and all phases of the project at a time acceptable to the District. Progress meetings will be held weekly, unless otherwise directed by District.
1. Meetings shall be held at Project Manager's on-site office trailer unless otherwise directed by the District.
 2. The District Representative will record meeting notes of the Weekly Progress Meeting. Within 3 working Days after the meeting, the District Representative will distribute minutes to District via e-mail, and to those affected by decisions made at the meeting. Attendees can either submit comments or additions to the minutes within 3 working days. The minutes will constitute a final documentation of the results of meeting.
- B. Progress meetings shall be attended by the Contractor's project manager, project engineer, and job superintendent, District Representative, Architect and Engineers, the Inspector of Record, and others as appropriate to agenda topics for each meeting.

- C. Agenda: The previous week meeting minutes will be used as the agenda for the subsequent meeting, with new business discuss for each agenda item.

1.8 BILLING MEETINGS

- A. See Section 01 29 00, Payment Procedures.

1.9 SPECIAL MEETINGS

- A. Contractor or District may call special meetings by notifying the desired participants. Notify District no less than 5 workdays in advance, and provide the reason for the meeting. Special meetings may be held without advance notice in emergency situations.
- B. At any time during the progress of Work, District shall have authority to require Contractor to attend a meeting with any or all of the Subcontractors engaged in the Work or in other work, and notice of such meeting shall be duly observed and complied with by Contractor.
- C. Contractor shall schedule and conduct his own periodic coordination meetings as necessary to discharge coordination responsibilities.
- D. Contractor shall give District five workday’s written notice of his coordination meetings. Contractors shall maintain and distribute minutes of coordination meetings to District. Attendees shall have three workdays to submit comments or additions to minutes. Minutes will constitute final documentation of results of coordination meetings.

1.10 GUARANTEES/WARRANTIES, BONDS, AND SERVICE & MAINTENANCE CONTRACTS REVIEW MEETING

- A. Ten Months following date of final acceptance/completion, Contractor to hold a meeting to review guarantees/warranties, bonds, and service maintenance contracts for materials and equipment. Implement repair or replacement of defective items, and extend service and maintenance contracts, as desired by District.
- B. Attending shall be:
 - 1. District Representatives
 - 2. Architect and Architect’s consultants, as appropriate
 - 3. CCC-Buildings & Grounds Representatives
 - 4. Contractor
 - 5. Subcontractors, as appropriate
 - 6. Others, as appropriate

PART 2 – PRODUCTS

Not Used

PART 3 – EXECUTION

Not Used

END OF SECTION 01 31 19

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**SECTION 01 31 40
ADMINISTRATIVE FORMS & LOGS**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. All Contract Documents shall be reviewed for applicable provisions related to the provisions in this document, and provisions in the General Conditions and other Division 1 Specification Sections shall apply to this Section without limitation.

1.2 RELATED REQUIREMENTS SPECIFIED IN OTHER SECTIONS

- A. Section 01 29 00 – “Payment Procedures”
- B. Section 01 32 13 – “Scheduling of Work”
- C. Section 01 31 00 – “Project Management and Coordination”
- D. Section 01 33 00 – “Submittal Procedures”
- E. Section 01 62 00 - “Product Options”
- F. Section 01 78 39 – “Project Record Documents”
- G. Divisions 2 through 41 Sections for Administrative Forms & Logs requirements for the Work in those Sections.

1.3 SUMMARY

- A. This section specifies the information and format requirements for administrative forms and logs.

1.4 ADMINISTRATIVE FORMS & LOGS

- A. Administrative forms and logs include, but are not limited to, the following (note, Procore system generated reports and forms will be used to the greatest extent possible, at the discretion of the District):
 - 1. Transmittal Form
 - 2. Submittal Transmittal Form
 - 3. Request for Information Form.
 - 4. Substitution Request Form. (Included with Addendum #1)
 - 5. 3-Week Projected Construction Schedule Form
 - 6. 3-Week Testing & Inspection Schedule Form
 - 7. Proposed Change Order Form.
 - 8. Change Order Form – See attached.
 - 9. Request for Information Log Form.
 - 10. Submittal Log Form
 - 11. Proposed Change Order Log Form.
 - 12. Change Order Log Form.

- 13. Contractor's Proposal for Contract Modification Form Procore system generated
 - 14. Contractor Production Report
 - 15. Pay Applications – Forms G732-2019 & G703
- B. Forms generated by project management software may be substituted if substitution forms contain essentially the same information as shown in these Contract Documents. Allowance for the use of substitute forms is at the sole discretion of the District, and shall be requested and approved before use of the substitute form. Forms marked with an asterisk (*) may NOT be substituted under any condition.
- C. Microsoft Excel files of these forms are available for Contractor use from the District.

1.5 FORMS INCORPORATED BY REFERENCE

- A. Forms available from the California Department of General Services, Division of the State Architect (DSA), <http://www.dgs.ca.gov/dsa/Forms.aspx>, related to administration, construction, testing, and inspection of public works school facilities are hereby incorporated by reference into these Contract Documents.

1.6 CONTRACTOR RESPONSIBILITIES

- A. Nothing in this Section 01 31 40 including, but not limited to the above forms and log forms, shall be construed to limit, relieve, or release Contractor from liability to District for any damages sustained as a result of inaccurate or incorrect information supplied by the Contractor.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

Not Used.

END OF SECTION 01 31 40

SECTION 01 31 80

DOCUMENT MANAGEMENT SYSTEM

PART 1 GENERAL

1.1 RELATED DOCUMENTS

1.1.1 All Contract Documents shall be reviewed for applicable provisions related to the provisions in this document, and provisions in the General Conditions and other Division 1 Specification Sections shall apply to this Section without limitation.

1.1.2 RELATED REQUIREMENTS SPECIFIED IN OTHER SECTIONS

1.1.3 Section 01 33 00 – “Submittal Procedures”

1.2 DESCRIPTION

1.2.1 This Section is in addition to the requirements in the Contract General Conditions and General Specifications.

1.2.2 The Contractor shall utilize the **Procore** web-based system to aid in the document control, management and communications between the District, Architect, and Contractor. The District and Contractor shall utilize **Procore’s** system for electronic submittal of all data and documents (unless otherwise specified or allowed by the District) throughout the duration of the Contract. **Procore** is a web-based electronic media site that is hosted by **Procore** utilizing their **Procore** web solution. The Contractor is responsible for obtaining a license and providing **Procore** to the Contractor’s project personnel, subcontractor personnel, and suppliers. The joint use of this system is to facilitate: electronic exchange of information, automation of key processes, and overall management of the Contract. **Procore** shall be the primary means of project information submission and management. When required by the District elsewhere in these Specifications, paper documents will also be provided. In the event of discrepancy between the electronic version and paper documents, the paper documents will govern.

1.2.3 Preconstruction Meeting/Contractor Information: At the Preconstruction Meeting, the Contractor shall provide to the District the email addresses of all Contractor personnel that will be using the **Procore** web based system. At a minimum, this will include the Contractor’s Project Manager, General Site Superintendent and Project Engineer. These personnel shall have sufficient computer skills required to access, and process documents over the Internet.

1.2.4 Document Signing: Contractor shall submit documents requiring a signature via Contractor DocuSign account.

1.3 USER ACCESS

1.3.1 The Contractor shall provide access to all District personnel involved in the project. Access shall include all necessary information and functions of the system required for management of the project including, but not limited to access to current Drawings & Specifications, RFIs, Submittals,

Photos and Daily Logs. The District's CM shall have access to the meeting section for creation and distribution of OAC agenda and minutes.

1.4 AUTOMATED SYSTEM NOTIFICATION AND AUDIT LOG TRACKING

Review comments made (or lack thereof) by the District on Contractor submitted documentation shall not relieve the Contractor from compliance with requirements of the Contract Documents. The Contractor is responsible for managing, tracking, and documenting the Work to comply with the requirements of the Contract Documents. District acceptance via automated system notifications or audit logs extends only to the face value of the submitted documentation and does not constitute validation of the Contractor's submitted information.

1.5 SUBMITTALS

See Section 01 33 00, Submittal Procedures for general submittal requirements.

1.5 COMPUTER REQUIREMENTS

The Contractor shall use computer hardware and software that meets the requirements of the **Procore** system as recommended by **Procore** to access and utilize **Procore**. As recommendations are modified by **Procore**, the Contractor will upgrade their system(s) to meet the recommendations or better. Upgrading of the Contractor's computer systems will not be justification for a cost or time modification to the Contract. The Contractor will ensure that connectivity to the **Procore** system (whether at the home office or job site) is accomplished through DSL, cable, T-1 or wireless communications systems with the necessary bandwidth for efficient functionality of the system.

1.6 CONTRACTOR RESPONSIBILITY

The Contractor shall be responsible for setting the project up in the **Procore** system, including but not limited to user management, document upload and maintenance of current versions, document flow and approval sequence subject to District approval. The Contractor is responsible for the validity of their information placed in **Procore** and for the abilities of their personnel. Accepted users shall be knowledgeable in the use of computers, including Internet Browsers, email programs, CAD drawing applications, and Adobe Portable Document Format (PDF) document distribution program. The Contractor shall utilize the existing forms in **Procore** to the maximum extent possible. If a form does not exist in **Procore**, the Contractor must include a form of their own, or use the forms provided **or required** by the District. Adobe PDF documents will be created through electronic conversion rather than optically scanned whenever possible. The Contractor is responsible for the training of their personnel in the use of **Procore** and the other programs indicated above as needed.

- 1.6.1 User Access Administration: Provide a list of Contractor's key **Procore** personnel for the District's acceptance. The District and Architect will provide a list of users requiring access to the system. The Contractor is responsible for adding these users to the system with necessary access permissions. The Contractor is responsible for adding users to and from the system as it pertains to their personnel or the personnel of their subcontractors and/or suppliers. The District reserves the right to perform a security check on all potential users.

- 1.6.2 **Procore** RFI Sketch Attachments: Faxed copies or hand delivered RFI attachments (sketches, product information, etc.) will NOT be accepted. The Contractor shall scan and convert all RFIs sketches and other documents into PDF files. To perform this task, the Contractor shall procure and use Adobe Acrobat Pro DC.
- 1.6.3 Construction Documents: Maintain a current set of drawings and specifications in **Procore** updated with the most recent version and links to RFIs on affected sheets. The documents shall be kept current and updated weekly at a minimum. This set will serve as the as-built drawings to be reviewed with the monthly pay application.

1.7 CONNECTIVITY PROBLEMS

Procore is a web-based environment; therefore, subject to the inherent speed and connectivity problems of the Internet. The Contractor is responsible for its own connectivity to the Internet. **Procore** response time is dependent on the Contractor's equipment, including processor speed, Internet access speed, etc., and current traffic on the Internet. The District is not liable for any delays associated from the usage of **Procore** including, but not limited to: slow response time, down time periods, connectivity problems, or loss of information. The Contractor will ensure that adequate connectivity to the **Procore** system (whether at the home office or job site) is accomplished through DSL, cable, T-1 or wireless communications systems. Under no circumstances shall the usage of **Procore** be grounds for a time extension or cost adjustment to the Contract.

1.8 PROCORE TRAINING AND SUPPORT

- 1.8.1 **Procore** Training and Support: See Procore website – support.procore.com. All **Procore** training or services desired by the Contractor, or its subcontractors, shall be at the expense of the Contractor.

PART 2 PRODUCTS

2.1 Description

Procore project management application (no equal) provided by **Procore**, www.PROCORE.com

PART 3 EXECUTION

3.1 PROCORE UTILIZATION

Procore will be used for, but not limited to, all of the following documents. At the direction of the District, the Contractor may be required to post other documents that are not listed below over the course of the Project.

1. Submittals/Shop Drawings/Samples (by Contractor; response by District)
2. Submittal substitution requests (by Contractor; response by District)
3. Requests for Information (by Contractor; response by District)
4. Non-Compliance Reports (by District; response by Contractor)

5. Schedules (by Contractor; response by District)
6. Project Photographs (by Contractor)
7. Posting Weekly Project Meeting Minutes (by District)
8. Change Order Request (by Contractor; response by District)
9. Field Instructions (by District; response by Contractor)
10. Payment Requests (by Contractor; response by District)
11. Daily Reports (by Contractor)
12. Inspection and Special Inspection & Testing Requests (by Contractor)
13. Punch lists (By Contractor)
14. Architectural Supplemental Instructions (by District)
15. Memos (General and notices to District or Contractor)
16. Conformed Drawings and Specifications (Contract Documents may be posted by the District)

3.2. Additional Information Regarding Submittals, Shop Drawings, Samples, Etc.

All submittals, shop drawings, samples, etc. shall be submitted as PDF attachments to the **Procore** submittal work flow process and form. See Section 01 33 00 for specific submittal requirements, including paper submittals and copies.

- 3.2.1 Shop Drawings: Contractor shop drawing and design data documents shall be submitted as PDF attachments (in addition to the hard copies requested) to the **Procore** submittal work flow process and form. Examples of shop drawings include, but are not limited to:
 - a. Standard manufacturer installation drawings.
 - b. Drawings prepared to illustrate portions of the work designed or developed by the Contractor.
 - c. Steel fabrication, piece, and erection drawings.
- 3.2.2 Product Data: Product catalog data and manufacturer's instructions shall be submitted as PDF attachments (in addition to the hard copies requested) to the **Procore** submittal work flow process and form. Examples of product data include, but are not limited to:
 - a. Manufacturer's printed literature.
 - d. Preprinted product specification data and installation instructions.
- 3.2.3 Samples: Sample submittals shall be physically submitted as specified in Section 01 33 00. Contractor shall enter submittal data information into **Procore** with a copy of the submittal form(s) attached to the sample. Examples of samples include, but are not limited to:
 - a. Product finishes and color selection samples.
 - b. Product finishes and color verification samples.
 - c. Finish/color boards.
 - d. Physical samples of materials.
- 3.2.4 Administrative Submittals: All correspondence and pre-construction submittals shall be submitted using **Procore**. Examples of administrative submittals include, but are not limited to:

- a. Digging permits and notices for excavation.
- b. SWPPP reports.
- c. List of product substitutions
- d. List of contact personnel.
- e. Notices for roadway interruption, work outside regular hours, and utility cutovers.
- f. Schedules and associated reports and updates. Each schedule submittal specified in Specification Section 01 32 13 shall be submitted as a native backed-up file (.PRX or .STX) of the scheduling program being used. The schedule will also be posted as a PDF file in the format specified in Specification Section 01 32 13.
- g. Plans for safety, demolition, environmental protection, and similar activities.
- h. Quality Control Plan(s), Testing Plan and Log, Quality Control Reports, Production Reports, Quality Control Specialist Reports, Preparatory Phase Checklist, Initial Phase Checklist, Field Test reports, Summary reports, Rework Items List, etc.
- i. Meeting minutes for quality control meetings, progress meetings, pre-installation meetings, etc.
- j. Any general correspondence submitted.

3.2.5 Compliance Submittals: Test reports, certificates, and manufacturer field report submittals shall be submitted on **Procore** as PDF attachments. Examples of compliance submittals include, but are not limited to:

- a. Field test reports.
- b. Quality Control certifications.
- c. Manufacturer’s documentation and certifications for quality of products and materials provided.

3.2.6 Record and Closeout Submittals

Operation and maintenance data and closeout submittals shall be submitted on **Procore** as PDF documents during the approval and review stage as specified, with actual set of documents submitted for final. Examples of record submittals include, but are not limited to:

- a. Operation and Maintenance Manuals: Final documents shall be submitted as specified.
- b. As-Built Drawings: Final documents shall be submitted as PDF and (2) hard copies.
- c. Extra Materials, Spare Stock, etc.: Submittal forms shall indicate when actual materials are submitted.

3.2.7 Financial Submittals: Schedule of Values, Progress Payment Requests and Change Order Requests shall be submitted on **Procore**. Supporting material for Pay Requests and Change Order Requests shall be submitted on **Procore** as PDF attachments. Examples of compliance submittals include, but are not limited to:

- a. Contractor’s Schedule of Values
- b. Contractors Monthly Progress Payment Requests
- c. Contractor Change Order Requests requested by the District.

3.3.0 Contractor Prepared Logs

3.3.1 The Contractor willll prepare the following logs that will be distributed at the weekly progress meetings: Open Request for Information Log; Open Submittal and Re-Submittal Log; Open Field Instruction Log; Open Notice of Non-Compliance Log; Open PCO log.

- 3.3.2 In addition, the Contractor will prepare a monthly summary with the following information:
Number of new RFIs and new submittals for the month and longest aging of each.

END OF SECTION 01 31 80

**SECTION 01 32 13
SCHEDULING OF WORK**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. All Contract Documents shall be reviewed for applicable provisions related to the provisions in this document, and provisions in the General Conditions and other Division 1 Specification Sections shall apply to this Section without limitation.

1.2 RELATED REQUIREMENTS SPECIFIED IN OTHER SECTIONS

- A. Section 01 11 00 – “Summary of Work”
- B. Section 01 29 00 – “Payment Procedures”
- C. Section 01 31 19 – “Project Meetings”
- D. Section 01 33 00 – “Submittal Procedures”
- E. Section 01 61 00 – “Common Product Requirements”
- F. Section 01 77 00 – “Closeout Procedures”
- G. Divisions 2 through 41 Sections for Construction Scheduling requirements for the work in those Sections.

1.3 SUMMARY

- A. This Section describes the requirements for Project construction schedules and reports.
- B. Development of schedules, cost and resource loading of the schedule, schedule updates, monthly payment requests, and project status reporting requirements of the Contract shall employ computerized Critical Path Method (CPM) scheduling utilizing Primavera P6.
- C. All CPM schedules shall be cost and resource loaded based on the Master Schedule of Values, as approved by District.
- D. Contractor shall provide one (1) Primavera P6 licenses to be used by the on-site District Representative for the duration of the project.

1.4 FAILURE TO MEET SCHEDULING REQUIREMENTS

- A. Failure of the Contractor to provide proper schedules as required by this Section is a material breach of the contract and grounds for termination pursuant to the General Conditions. The District, at its sole discretion, may choose, instead, to withhold, in whole or in part, any progress payments or retention amounts otherwise payable to the Contractor.

1.5 SCHEDULER’S QUALIFICATIONS

- A. Contractor shall utilize experienced scheduling personnel qualified to use Primavera P6 Enterprise, current version scheduling software, or alternate software if approved by the District. Experience level required is set forth below. Contractor may employ such personnel directly or may employ a consultant for this purpose.
- B. Within five (5) days after bid opening, the apparent successful low bidder shall provide to District and Architect a written verification either that Contractor has the required personnel under its employ or that Contractor will employ a CPM scheduling consultant. This written verification shall include:
 - 1. Name of the individual who will perform all required CPM scheduling tasks during the entire Project.
 - 2. Resume of the individual, to include description of similar, recent construction projects on which the individual has successfully created and updated computerized CPM schedules. Experience must include at least two projects of similar nature, scope and value not less than three-fourths the Contract Price of this Project.
 - 3. Contact persons for all referenced projects with current telephone and address information.
- C. District reserves right to accept or reject Contractor's scheduler, and right to reject them at any time.
- D. District also reserves right to refuse replacement of Contractor's scheduler if it believes such replacement will negatively affect the Project.

1.6 CONSTRUCTION SCHEDULES, GENERAL

- A. Upon Notice to Proceed, Contractor shall immediately commence development of initial and BASELINE CPM Schedules. Reference to Project Schedule shall pertain to the initial CPM schedule, BASELINE CPM schedule or an update of the BASELINE CPM Schedule as appropriate during the time period it is in affect during construction. When reference is made in the Contract Documents to a BASELINE CPM SCHEDULE, shall have the same meaning as an update to the BASELINE CPM SCHEDULE.
- B. All construction schedules shall be based on and incorporate all milestones and completion dates specified in the Contract Documents. See also Sections 01 11 00, Summary of Work. Show in the schedule the sequence in which the Contractor proposes to perform the Work and dates on which the Contractor contemplates starting and completing all schedule activities. The scheduling of the entire project is required. Contractor management personnel shall actively participate in its development. Subcontractors and suppliers working on the Project shall also contribute in developing and maintaining an accurate Project Schedule. Provide a Project Schedule that is a forward planning as well as a project monitoring tool.
- C. Use the approved Project Schedule to measure the progress of the Work and to aid in evaluating time extensions.

- D. Make the master BASELINE CPM SCHEDULE cost loaded and resource loaded.
- E. The schedule will provide the basis for all progress payments. If the Contractor fails to submit any schedule within the time prescribed, the District may withhold approval of progress payments until the Contractor submits the required schedule.
- F. Provide a Schedule Status Report on at least a monthly basis. If, in the opinion of the District, the Contractor falls behind the approved schedule, the Contractor shall take all steps necessary to improve its progress including those that may be required by the Architect or Project Manager, without additional cost to the District. In this circumstance, the District may require the Contractor to increase the number of shifts, overtime operations, days of work, and/or the amount of construction plant, and to submit for approval any supplementary schedule or schedules as the District deems necessary to demonstrate how the approved rate of progress will be regained.
- G. Failure of the Contractor to comply with the requirements of the District shall be grounds for a determination that the Contractor is not prosecuting the Work with sufficient diligence to ensure completion within the time specified in the Contract Documents. Upon making this determination, the District may terminate the Contractor's right to proceed with the Work, or any separable part of it, in accordance with the default terms of the Contract.
- H. NOT USED
- I. No Project Schedule shall exceed time limits set forth in the Contract Documents. Failure to submit a schedule, or submittal of a Project Schedule which shows completion of the Work beyond the specified completion date shall be deemed a material breach by the Contractor.
- J. All Project Schedules must indicate the beginning and completion of all Work and shall use the "Critical path Method" for the value reporting, planning and scheduling of all Work required under the Contract Documents.
- K. Overall time of completion between the Notice to Proceed and Substantial Completion to Final Completion shown on any Project Schedule shall adhere to completion times as stated in the Construction Agreement, unless an earlier (advanced) time of completion is requested by Contractor and agreed to by District. Any such agreement shall be formalized by a Change Order.
 - 1. District is not required to accept an advanced schedule, i.e., one that shows early completion dates for the Work or any Phase of the Work.
 - 2. In the event agreement is reached between Contractor and District on an advanced schedule, Contractor shall not be entitled to extra compensation if Contractor completes its Work, for whatever reason (excepting approved changes with added time components) beyond completion date(s) shown in any approved advanced schedule but within the originally specified completion dates.
 - 3. Contractor shall not submit a schedule showing early completion without indicating float time through the date set for Project completion by District.
 - 4. Contractor's schedule shall account for all days past early completion as float which belongs to the Project. Usage of float shall not entitle Contractor to any delay claim or damages due to delay.

- L. Float Ownership: Neither the District nor the Contractor owns float. The Project owns the float. As such, liability for delay of the Substantial Completion Date(s) rests with the party whose actions, last in time, actually cause delay to the Substantial Completion Date(s).
 - 1. For example, if Party A uses some, but not all of the float and Party B later uses remainder of the float as well as additional time beyond the float, Party B shall be liable for the time that represents a delay to the Substantial Completion Date.
 - 2. Party A would not be responsible for the time since it did not consume the entire float and additional float remained; therefore, the Substantial Completion Date was unaffected.
- M. The District may disapprove of any construction schedule or require modification to it if, in the opinion of the Architect or District, adherence to the construction schedule will not cause the Work to be completed in accordance with the Agreement.
- N. Use Primavera P6, compatible with Windows operating system for creation and updates of all required construction schedules. Contractor shall provide digital schedule P6 XER files to District on CD at times requested by District.
- O. Transmit construction schedule files under form approved by District.

1.7 SCHEDULE FORMAT AND LEVEL OF DETAIL

- A. All Work activity durations shall be in Workdays.
- B. The Schedule shall be the basis for evaluating job progress, payment requests, and time extension requests associated with the changes.
- C. Responsibility for developing all Schedules and monitoring actual progress rests with Contractor. Schedules shall comply with following requirements:
 - 1. All Contractor, Subcontractor and assigned Contractor work shall be shown in a logical work sequence that demonstrates a coordinated plan of work for all contractors. The intent is to provide a common basis of acceptance, understanding and communication, as well as interface with other contractors.
 - 2. Activities related to the delivery of Contractor and District-furnished equipment to be Contractor installed per Contract shall be shown.
 - a. District-furnished District Installed materials and equipment, if any, shall be identified as separate activities.
 - 3. Show District and other agency activities that could impact progress. These activities include, but are not limited to: approvals, submittal reviews, environmental permit approvals by State regulators, inspections, utility tie-in, Owner Furnished Equipment (OFE) and Notice to Proceed (NTP) for Phasing requirements.
 - 4. All activities shall be identified through codes or other identification to indicate the phase of Work and Contractor/Subcontractor responsibility to which they pertain.
 - 5. Show the critical path in red. For each activity, show early start, late start, early finish, late finish, durations measured in days, float, predecessor and successor activities, planned workday/week for the activity, and scheduled/actual progress payments.
 - 6. Reasonable activity durations are those that allow the progress of ongoing activities to be accurately determined between update periods. Less than 2 percent of all non-

procurement activities shall have durations greater than 20 work days or 30 calendar days unless otherwise approved by District and Architect. Procurement activities are defined herein.

- a. Procurement Activities
 - i) The schedule must include activities associated with the submittal, approval, procurement, fabrication and delivery of long lead materials, equipment, fabricated assemblies and supplies. Long lead procurement activities are those with an anticipated procurement sequence of over 45 calendar days. A typical procurement sequence includes the string of activities: submit, approve, procure, fabricate, and deliver. Procurement of all contract required material and equipment shall be identified as a separate activity.
 - ii) These activities shall not be cost loaded unless previously approved, at the District's sole discretion, by the District.
 - b. Include time for fabrication and delivery of manufactured products for the Work.
 - c. Show dependencies between procurement and related construction activity.
7. Activity durations shall be total number of actual work days required to perform that activity.
 8. Provide activity coding to enable sorting by responsibility, location, phase of Work, Work Restriction, and CSI division. Assign activity codes to any activity or sequence of activities added to the Project Schedule as a result of a Change Orders, when approved by the District with a Change Order code. Integrate the code values to the Contractor's numbering system. An activity shall not have more than one Change Order code.
 9. The start and completion dates of all items of Work, Work Phases, their major components, and milestone completion dates shall be included.
 10. Mandatory Tasks. The following tasks must be included and properly scheduled. Items noted with "SOV item upon Approval only" shall include an amount in the cost loaded schedule and in the SOV:
 - a. Submission of mechanical/electrical/information systems (BIM) layout drawings. Submission, review and acceptance of DSA deferred approval packages. (SOV item upon Approval only)
 - b. Submission and approval of O & M manuals. (SOV item upon Approval only)
 - c. Submission and approval of as-built drawings. (SOV item upon Approval only)
 - d. Submission and approval of installed equipment lists. (SOV item upon Approval only)
 - e. Submission and approval of testing and air balance (TAB) if applicable. (SOV item upon Approval only)
 - f. Submission of TAB specialist design review report if applicable.
 - g. Submission and approval of fire protection specialist if applicable.
 - h. Submission and approval of testing and balancing of HVAC plus commissioning plans and data if applicable.
 - i. Air and water balancing if applicable.

- j. HVAC commissioning if applicable.
 - k. Controls testing plan submission if applicable.
 - l. Controls testing if applicable.
 - m. Performance Verification testing if applicable. (SOV item upon Approval only)
 - n. Other systems testing, if required.
 - o. Contractor's pre-final inspection.
 - p. Correction of punch list from Contractor's pre-final inspection. (SOV item upon Approval only)
 - q. District's pre-final inspection.
 - r. Correction of punch list from District's pre-final inspection. (SOV item upon Approval only)
 - s. Final inspection.
 - t. Allowances for normal weather and Campus non-work days
11. Dependencies (or relationships) between activities shall be shown.
 12. Complete all activity descriptions, including what Work is to be accomplished, where, and when.
 13. Include anticipated non-Workdays, such as weekends, holidays, and/or other observances in the Schedule.
 14. Provide activity coding to enable sorting by responsibility, location, phase of Work, Work Restriction, and CSI division. Assign activity codes to any activity or sequence of activities added to the Project Schedule as a result of a Change Orders, when approved by the District with a Change Order code. Integrate the code values to the Contractor's numbering system. An activity shall not have more than one Change Order code.
 15. The start and completion dates of all items of Work, Work Phases, their major components, and milestone completion dates shall be included.
 16. Contractor's Shop Drawing and Samples Submittal Schedule: As part of the BASELINE CPM SCHEDULE submittal, the Contractor shall prepare a separate schedule for review and approval by the Architect and the District, detailing the processing and approval of submittals and shop drawings for all Contract-required material and equipment. This schedule shall be extracted from the BASELINE CPM SCHEDULE. Activities that are dependent on submittal acceptance or material delivery shall not be scheduled to start earlier than expected acceptance or delivery dates.
 - a. Include time for submittals, resubmittals, and reviews by District and DSA. Coordinate with accepted Project Schedule for submission of shop drawings, samples and other submittals.
 - b. Contractor shall be responsible for all impacts resulting from resubmittal of either shop drawings or any other required submittal.
 17. Complete all activity descriptions, including what Work is to be accomplished, where, and when.

18. The costs associated with each Work activity shall be the total of labor, material, equipment, with overhead and profit tracked separately. The sum of the costs for all activities plus overhead and profit shall equal the total Contract value.
 19. Include an identify code for each activity corresponding to either the Contractor or Subcontractor responsible for performing the Work.
 20. Identify the Work activities that constitute the critical path. No more than twenty-five (25%) of the activities shall be critical or near critical. Near critical is defined as float in the range of one (1) to seven (7) calendar days.
 21. Include at least twenty (20) workdays for the combined durations of all activities related to developing punch list(s), completion of punch list items and final clean-up for the Work or any designated portion thereof. No other activities shall be scheduled during this period. Refer to Section 01 77 00, Closeout Procedures for specific activities required.
 22. Show detailed Subcontractor Work activities. In addition, furnish copies of Subcontractor schedules upon which BASELINE CPM SCHEDULE was built.
 - a. Also furnish for each Subcontractor, as determined by District, submitted on Subcontractor letterhead a statement certifying that Subcontractor concurs with Contractor's BASELINE CPM SCHEDULE, and that Subcontractor's related schedules have been incorporated.
 - b. Subcontractor schedules shall be independently derived and not a copy or subset of the Contractor's BASELINE CPM SCHEDULE.
 - c. Furnish schedule for Contractor/Subcontractor CPM schedule meetings which shall be held prior to submission of BASELINE CPM SCHEDULE to District. District shall be permitted to attend scheduled meetings as an observer.
 23. Submit a list of anticipated non-Workdays, such as weekends, holidays, and/or other observances.
- D. Seasonal weather conditions (which do not constitute a delay as defined herein) shall be considered in the planning and scheduling of all work influenced by high or low ambient temperatures or presence of high moisture for the completion of the Work within the allotted Contract Time.
- E. Failure by Contractor to include any element of Work required for performance of the Work on any Project schedule shall not excuse Contractor from completing all Work required within the Contract Time.
- F. Contractor shall schedule all deferred approval items and shop drawings in its schedules if appropriate. If Contractor fails to include deferred approval items and shop drawings in its schedule which results in a critical path delay, then Contractor shall be subject to the assessment of liquidated damages.
- G. CPM Logic Requirements
1. The Project Schedule interval shall extend from NTP date to the required Contract Substantial and Final Completion dates. The Contract completion activity (End Project) shall finish based on the required contract duration in the Contract Documents, as adjusted for any approved contract time extensions. The first scheduled work period shall be the day

after NTP is acknowledged by the Contractor. Schedule activities on a calendar to which the activity logically belongs. Activities may be assigned to a 7-day calendar when the contract assigns calendar day durations for the activity such as a District acceptance activity if the Contract Documents specify Calendar Days. If the Contractor intends to perform physical work less than seven days per week, schedule the associated activities on a calendar with non-work periods identified including weekends and holidays. Assign the Category of Work Code – Weather Sensitive Installation to those activities that are weather sensitive. Original durations must account for anticipated normal adverse weather. The District will interpret all work periods not identified as nonwork periods on each calendar as meaning the Contractor intends to perform work during those periods.

2. The Project Schedule shall start no earlier than the date on which the NTP was acknowledged. Include as the first activity in the Project Schedule an activity called "Start Project"(or NTP). The "Start Project" activity shall have an "ES" constraint date equal to the date that the NTP was acknowledged, and a zero-day duration
3. Project Schedule Constraints and Open-Ended Logic Constrain completion of the last activity in the Project schedule by the Contract Final Completion date. Schedule calculations shall result in a negative float when the calculated early finish date of the last activity is later than the Contract Final Completion date. Include as the last activity in the Project Schedule an activity called "End Project". The "End Project" activity shall have an "LF" constraint date equal to the Contract Final Completion date for the Project, with a zero-day duration, or shall achieve the same result by using the "project must finish on" date in the scheduling software. The Project Schedule shall have no constrained dates other than those specified in the Contract. The use of artificial float constraints such as "zero fee float" or "zero total float" are prohibited unless the Contractor specifically requests preapproval and receives District approval of this constraint on an activity specific level. There shall only be 2 open ended activities: Start Project (or NTP) with no predecessor logic and End Project with no successor logic.
4. In the event the Initial CPM schedule or BASELINE CPM SCHEDULE calculates an early completion date of the last activity prior to the Contract Final Completion date, the Contractor shall identify those activities that it intends to accelerate and/or those activities that are scheduled in parallel to support the Contractor's "early" completion. The last activity shall have a late finish constraint equal to the Contract Final Completion date and the schedule will calculate positive float. The District will not approve an early completion Project Schedule with zero float on the longest path. The District is under no obligation to accelerate activities for which it is responsible to support a proposed early contract completion.
5. Interim Completion Dates. Constrain contractually specified interim completion dates to show negative float when the calculated early finish date of the last activity in that phase is later than the specified interim completion date.
6. Start Phase. Include as the first activity for a project phase an activity called "Start Phase X" where "X" refers to the phase of work. The "Start Phase X" activity shall have an "ES" constraint date equal to the date on which the NTP was acknowledged, and zero-day duration.

7. End Phase. Include as the last activity for a project phase an activity called "End Phase X" where "X" refers to the phase of work. The "End Phase X" activity shall have an "LF" Constraint date equal to the specified completion date for that phase and a zero-day duration.
8. Phase "X" Hammock. Include a hammock type activity for each project phase called "Phase X" where "X" refers to the phase of work. The "Phase X" hammock activity shall be logically tied to the earliest and latest activities in the phase.
9. Default Progress Data Disallowed. Do not automatically update Actual Start and Finish dates with default mechanisms that may be included in the scheduling software. Activity Actual Start (AS) and Actual Finish (AF) dates assigned during the updating process shall match those dates provided from Daily Reports. Failure of the Contractor to document the AS and AF dates on the Daily Report for every in-progress or completed activity, and failure to ensure that the data contained on the Daily Reports is the sole basis for schedule updating shall result in the disapproval of the Contractor's updated BASELINE CPM SCHEDULE and the inability of the District to evaluate Contractor progress for payment purposes. Updating of the percent complete and the remaining duration of any activity shall be independent functions. Disable program features which calculate one of these parameters from the other.
10. Other Logic Requirements:
 - a. Activities that have progressed before all preceding logic has been satisfied (Out-of-Sequence Progress) will be allowed only on a case-by-case basis subject to approval by the District. Propose logic corrections to eliminate all out of sequence progress or justify not changing the sequencing for approval prior to submitting an updated Project Schedule. Correct out of sequence progress that continues for more than two update cycles by logic revision, as approved by the District.
 - b. Lag durations contained in the project schedule shall not have a negative value. Do not use Start to Finish (SF) relationships.
 - c. Project Schedule calculations shall retain the logic between predecessors and successors even when the successor activity starts and the predecessor activity has not finished. Software features that in effect sever the tie between predecessor and successor activities when the successor has started and the predecessor logic is not satisfied ("progress override") will not be allowed.
11. Milestones. The Project Schedules must include milestone activities for each significant project event including but not limited to: All phases, foundation/substructure construction complete; superstructure construction complete; building dry-in or enclosure complete to allow the initiation of finish activities; permanent power complete; and building systems commissioning complete (for each applicable phase of Work).

1.8 INITIAL CRITICAL PATH METHOD (CPM) SCHEDULE

- A. Within ten (10) calendar days following Notice to Proceed, Contractor shall submit an Initial CPM Schedule along with an Initial Schedule of Values for District's approval.

- B. Within ten (10) calendar days following Notice to Proceed, Contractor shall submit a cost curve based on the Initial CPM Schedule and the Initial Schedule of Values, showing the cumulative estimated payments for all of the Work for the entire period of performance;
- C. District and Contractor shall meet to review and discuss the Initial CPM Schedule within five (5) working days after it has been submitted to District.
 - 1. District's review and comment on the Initial CPM schedule shall be limited to conformance with the Contract Documents (with Work phasing, sequencing, coordination, milestone requirements, and specified formatting and information requirements) and accepted CPM principals.
 - 2. Contractor shall make corrections to the Initial CPM Schedule as necessary to comply with Contract requirements and shall adjust the schedule to incorporate any missing information as requested by District. Contractor shall resubmit the Initial CPM Schedule if requested by District.
- D. Initial CPM Schedule must indicate detailed plan for the Work to be completed during the first sixty (60) days of the Contract, including details of planned mobilization of plant and equipment, the sequence of early operations, and the procurement of materials and equipment. Show Work beyond ninety (90) calendar days in summary form through the Contract Substantial and Final Completion dates.
- E. Initial CPM Schedule shall be time-scaled.
- F. The accepted Schedule of Values will be used as basis for initial payments until acceptance of the BASELINE CPM SCHEDULE by District. Use of the Initial Schedule of Values for progress payments shall not exceed sixty (60) calendar days.
- H. If, during the first thirty (30) days after Notice-to-Proceed, the Contractor is of the opinion that any of the Work included on its Initial CPM Schedule has been impacted, the Contractor shall submit to District a written Time Impact Evaluation (TIE) in accordance with the requirement of this Section. The TIE shall be based on the most current update of the initial CPM Schedule.

1.9 BASELINE CPM SCHEDULE

- A. Within fifteen (15) calendar days from approval of the Initial CPM Schedule, Contractor shall submit on P6 XER files a detailed BASELINE CPM SCHEDULE, INCLUDING COST AND RESOURCE loading, presenting an orderly and realistic plan for completion of the Work, in conformance with requirements specified herein.
- B. Failure of the BASELINE CPM SCHEDULE to include any element of the Work or any inaccuracy in the BASELINE CPM SCHEDULE will not relieve Contractor from responsibility for accomplishing the Work in accordance with the Contract.
- C. District's acceptance of the BASELINE CPM SCHEDULE shall be for its use in monitoring and evaluating job progress, payment requests, and time extension requests, and shall not, in any manner, impose a duty of care upon District, or act to relieve Contractor of its responsibility for means and methods of construction.

- D. Contractor shall, within 10 calendar days from the Submittal of the BASELINE CPM SCHEDULE, shall meet with District to review the BASELINE CPM SCHEDULE submittal.
 - 1. Contractor shall have its Construction Manager, Project Superintendent, Project Scheduler, and key Subcontractor representatives, as required by District, in attendance. The meeting will take place over a continuous one-day period.
 - 2. District’s review will be limited to submittal's conformance to Contract requirements. Review may also include:
 - a. Critical path method principles and tenets utilized
 - b. Clarifications of Contract Requirements
 - c. Directions to include activities and information missing from the submittal
 - d. Requests to Contractor to clarify its schedule
 - 3. Within five (5) days of the Schedule Review Meeting, Contractor shall respond in writing to all questions and comments expressed by District at the Meeting.

1.10 ADJUSTMENTS TO THE BASELINE CPM SCHEDULE

- A. Contractor shall revise the r BASELINE CPM SCHEDULE submittal to address all review comments from the review meeting described above, and resubmit the BASELINE CPM SCHEDULE for District review and approval.
 - 1. District, within ten (10) days from date that Contractor submitted the revised BASELINE CPM SCHEDULE, will either:
 - a. Accept the BASELINE CPM SCHEDULE as submitted, or
 - b. Advise Contractor in writing to review any part or parts of the BASELINE CPM SCHEDULE which either do not meet Contract requirements, or are unsatisfactory for District to purposes of monitoring Project progress, resources, and status, or to evaluate monthly payment request by Contractor.
 - 2. District may accept the BASELINE CPM SCHEDULE with conditions that the first monthly update of the BASELINE CPM SCHEDULE will be revised to correct identified deficiencies.
 - 3. When the BASELINE CPM Schedule is accepted, it shall be considered the BASELINE CPM SCHEDULE, which will then be immediately updated to reflect the current status of the work.
 - 4. District reserves right to require Contractor to adjust, add to, or clarify any portion of BASELINE CPM Schedule which may later be discovered to be insufficient for monitoring the Work or approving payment requests. No additional compensation will be due to the Contractor for any such adjustments, additions, or clarifications.
- B. Acceptance of Contractor's BASELINE CPM SCHEDULE by District will be based upon schedule's compliance with Contract requirements and accepted CPM principles.
 - 1. In assigning activity durations and proposing Work sequences, Contractor agrees to utilize sufficient and necessary management and other resources to perform work in accordance with the approved BASELINE CPM SCHEDULE.

2. Upon submittal and District approval of any BASELINE CPM SCHEDULE Update, such updated schedule shall then be considered the "current" BASELINE CPM SCHEDULE.
 3. Submission of Contractor's BASELINE CPM SCHEDULE to District shall not relieve Contractor of total responsibility for scheduling, sequencing, and executing the Work to comply with requirements of Contract Documents, including recovery from adverse effects such as delays resulting from ill-timed work.
- C. Submittal of the BASELINE CPM SCHEDULE, and subsequent Updates on P6 XER files shall be understood to be the Contractor's representation that the BASELINE CPM SCHEDULE meets all requirements of Contract Documents, and that the Work shall be executed in the sequence and within the time indicated on the schedule.
- D. Contractor shall distribute the BASELINE CPM SCHEDULE to Subcontractors for review and written acceptance, which shall be noted on Subcontractors' letterhead to Contractor and transmitted to District for the Project record.

1.11 BASELINE CPM SCHEDULE MONTHLY UPDATES

- A. Following acceptance of Contractor's BASELINE CPM SCHEDULE, Contractor shall monitor the progress of Work and adjust the BASELINE CPM SCHEDULE each month to reflect actual progress, and to illustrate any anticipated changes to planned activities.
1. Each BASELINE CPM SCHEDULE Update submitted by Contractor on P6 XER files shall be complete, including all information requested for the original BASELINE CPM SCHEDULE submittal.
 2. Each BASELINE CPM SCHEDULE Update submitted by Contractor shall continue to show all work activities including those already completed. Any completed activities shall accurately reflect "as built" information by indicating when Work activities were actually started and completed. Contractor shall warrant the accuracy of as-built information shown on each BASELINE CPM SCHEDULE Update.
- B. A meeting will be held within the first week of each month with the District and Project Inspector to review the BASELINE CPM SCHEDULE Update submittal and progress payment application for the previous month. Conduct periodic schedule update meetings for the purposes of reviewing the Contractor's proposed out of sequence corrections, determining causes for delay, correcting logic, maintaining schedule accuracy and determining earned value. Provide a computer with the scheduling software loaded and a projector during the meeting which allows all meeting participants to view the proposed BASELINE CPM SCHEDULE Update during the meeting. The meeting and resultant approvable BASELINE CPM SCHEDULE Update shall be a condition precedent to a formal submission of the BASELINE CPM SCHEDULE Update and to the submission of an invoice for payment. The meeting will be a working interactive exchange which will allow the District and the Contractor the opportunity to review the BASELINE CPM SCHEDULE Update on a real time and interactive basis. The Contractor's authorized scheduling representative will organize, sort, filter and schedule the update as requested by the District. A rough draft of the proposed activity logic corrections and narrative report shall be provided to the District 48 hours in advance of the meeting.

1. At this monthly meeting, a minimum requirement for review shall be included, but not limited to the following items:
 - a. Percent complete of each Work activity
 - b. Time impact evaluations for Change Orders and Time Extension Requests, if any
 - c. Actual and anticipated Work activity sequence changes
 - d. Anticipated Work activity duration changes
 - e. Actual and anticipated Contractor delays
2. These meetings are a critical component of overall monthly BASELINE CPM SCHEDULE Update submittal and Contractor shall ensure appropriate personnel attend. At a minimum, Contractor's Project Engineer, General Superintendent, and Scheduler shall attend these meetings.
3. Status of Activities. Update information, including Actual Start Dates (AS), Actual Finish Dates (AF), Remaining Durations (RD), and Percent Complete shall be subject to the approval of the District at to the meeting. As a minimum, address the following items on an activity by activity basis during each progress meeting.
 - a. Start and Finish Dates. Accurately show the status of the AS and/or AF dates for each activity currently in-progress or completed since the last update. The District may allow an AF date to be assigned with the percent complete less than 100% to account for the value of work remaining but not restraining successor activities. Only assign AS dates when actual progress occurs on an activity.
 - b. Remaining Duration. Update the estimated RD for all incomplete activities independent of Percent Complete. Remaining Durations may exceed the activity original duration (OD) or may exceed the activity's prior update RD if the District considers the current OD or RD to be understated based on current progress, insufficient work crews actually manning the job, unrealistic OD or deficiencies that must be corrected that restrain successor activities.
 - c. Percent Complete. Update the percent complete for each activity started, based on the realistic assessment of earned value. Activities which are complete but for remaining minor punch list work, and which do not restrain the initiation of successor activities, may be declared 100 percent complete. To allow for proper schedule management, cost load the correction of punch list from District pre-final inspection activity(ies) for each phase not less than 1 percent of the total value of that phase, which activity(ies) may be declared 100 percent complete upon completion and correction of all punch list work identified during District's pre-final inspection(s).
 - d. Logic Changes. Specifically identify and discuss all logic changes pertaining to NTP on change orders, change orders to be incorporated into the BASELINE CPM SCHEDULE Update, Contractor proposed changes in work sequence, corrections to schedule logic for out-of-sequence progress, and other changes that have been made pursuant to contract provisions. The District will only approve logic revisions for the purpose of keeping the schedule valid in terms of its usefulness in calculating a

- realistic completion date, correcting erroneous logic ties, and accurately sequencing the work.
- e. Other Changes. Other changes required due to delays in completion of any activity or group of activities include: 1) delays beyond the Contractor's control, such as strikes and unusual weather. 2) delays encountered due to submittals, District activities, deliveries or work stoppages which make re-planning the work necessary.
 - f. Changes required to correct a BASELINE CPM SCHEDULE Update that does not represent the actual or planned prosecution and progress of the Work.
- C. Within five (5) working days after monthly schedule update meeting, Contractor shall submit the updated BASELINE CPM SCHEDULE Update.
 - D. Within five (5) workdays of receipt of above noted revised submittals, District will either accept or reject monthly BASELINE CPM SCHEDULE Update submittal.
 - 4. If rejected, update shall be corrected and resubmitted by Contractor before the Application for Payment is submitted.
 - 5. District and Architect will not review Contractor's application for payment if the updated monthly BASELINE CPM SCHEDULE Update is not provided and accepted by District.
 - E. Neither updating, changing or revising of any report, curve, schedule or narrative submitted by Contractor under this Contract, nor District's review or acceptance of any such report, curve, schedule or narrative, shall have the effect of amending or modifying in any way the Contract Substantial or Final Completion date or any phase completion dates, or of modifying or limiting in any way Contractor's obligations under this Contract.
 - F. Updating the BASELINE CPM SCHEDULE to reflect actual progress shall not be considered revisions to the Project Schedule.
 - G. To clarify any revisions to the BASELINE CPM SCHEDULE Update, the Contractor shall provide District with a written narrative explaining the reasons for each Work activity revision. For revisions affecting the sequence of work, the Contractor shall provide a schedule diagram which compares the original sequence to the revised sequence of work. The Contractor shall provide the written narrative and schedule diagram for revisions two (2) working days in advance of the monthly BASELINE CPM SCHEDULE Update meeting.
 - H. Schedule revisions shall not be incorporated into any BASELINE CPM SCHEDULE Update until the revisions have been reviewed and approved by District. District may request further information and justification for BASELINE CPM SCHEDULE revisions. Contractor shall, within three (3) days of any such District request, provide District with a complete written narrative response.
 - I. If the Contractor's revision is still not accepted by District, and the Contractor disagrees with District's position, the Contractor has three (3) work days from receipt of District's letter rejecting the revision to provide a written narrative providing full justification and explanation for the revision. The Contractor's failure to respond in writing within three (3) work days of District's written rejection of a schedule revision shall be contractually interpreted as acceptance of

District's position, and the Contractor waives its rights to subsequently dispute or file a claim regarding District's position.

- J. At District's discretion, the Contractor may be required to provide subcontractor(s) certifications of Work activity performance regarding any proposed BASELINE CPM SCHEDULE revisions affecting said subcontractor(s).

1.12 WEEKLY LOOK AHEAD SCHEDULE

- A. At each Weekly Progress Meeting, the Contractor shall provide and present a time-scaled three (3) week schedule: one (1) week behind and two (2) week look ahead schedule that is based on and correlated by activity number in the current BASELINE CPM SCHEDULE Update. Provide a two week look ahead schedule in bar chart format, showing daily activities for that period.

1.13 OTHER SCHEDULE RELATED REPORTS

- A. Submit four (4) hard copies of the following reports with the Initial CPM Schedule, the Master CPM Schedule, and with each monthly update of the BASELINE CPM SCHEDULE:
 - 1. Two (2) activity-listing reports: one report sorted by activity number and one report by total float. These reports shall also include each activity's early/late and actual start and finish dates, original and remaining duration, float, responsibility code and the logic relationship of activities.
 - 2. Schedule plots presenting time scaled network diagram showing activities and their relationships with the controlling operations or critical path clearly highlighted.
 - 3. Monthly status report, to include:
 - a. Status of major Project components (percent complete, amount of time ahead or behind schedule) and an explanation of how Project will be brought back on schedule if delays have occurred.
 - b. Progress made on critical activities indicated on Project Schedule.
 - c. Explanations for any lack of work on critical path activities planned to be performed during last month.
 - d. Explanations for any schedule changes, including changes to logic or to activity durations.
 - e. List of critical activities scheduled to be performed next month.
 - f. Status of major material, and equipment procurement.
 - g. Any delays encountered during reporting period.
 - h. Contractor may include any other information pertinent to status of Project. Contractor shall include additional status information requested by District at no additional cost.
 - i. Status reports, and the information contained therein, shall not be construed by the Contractor as claims, notice of claims, notice of delay, or requests for changes or compensation.

- B. Furnish DISTRICT with digital files of all reports and BASELINE CPM SCHEDULE Updates on labeled CD ROM

1.14 RECOVERY SCHEDULE

- A. If any BASELINE CPM SCHEDULE Update shows that the Contract Substantial Completion date is five (5) calendar days beyond the Contract Substantial Completion date, the Contractor shall submit to District proposed schedule revisions to recover the lost time within seven (7) calendar days. As part of this Recovery Schedule submittal, the Contractor shall provide a written narrative for each schedule revision made to recapture the lost time. If the revisions include sequence changes, the Contractor shall provide a schedule diagram comparing the original sequence to the revised sequence of work.
- B. Recovery Schedule revisions shall not be incorporated into any BASELINE CPM SCHEDULE Update until the revisions have been reviewed and approved by the District.
- C. If the Contractor's Recovery Schedule revisions are not accepted by District, District and the Contractor shall follow the procedures in paragraph 1.10 H through J, above.
- D. If requested by District, Contractor shall provide revised schedules within ten (10) days if, at any time, the District consider the completion date to be in jeopardy because of activities that are behind schedule. The additional schedule shall include a new arrow or precedence diagram and schedule reports conforming to the requirements herein, designed to show how the Contractor intends to accomplish the Work to meet the completion date.
- E. The Contractor shall modify any portions of the schedule that become infeasible because of "activities behind schedule" or for any other valid reason. An activity that cannot be completed by its original latest completion date shall be deemed to be behind schedule.

1.15 TIME IMPACTS EVALUATION (TIE) FOR CHANGE ORDERS AND OTHER POTENTIAL DELAYS

- A. When Contractor is directed to proceed with changed Work, which the Contractor considers have a time impact, the Contractor shall prepare and submit, within seven (7) calendar days from the direction to proceed, a Time Impact Evaluation (TIE) which includes both a written narrative and a schedule diagram depicting how the changed work affects other schedule activities. The schedule diagram shall show how the Contractor proposes to incorporate the changed Work in the schedule, and how it impacts the current BASELINE CPM SCHEDULE and critical path. The Contractor is responsible for requesting time extensions based on the TIEs impact on the critical path. The diagram must correspond to the main sequences of Work activities in the current BASELINE CPM SCHEDULE, to enable District to evaluate time impact of changed work to the scheduled critical path.
- B. Contractor shall be required to comply with the above requirements for all types of delays such as, but not limited to, Contractor/Subcontractor delays, adverse weather delays, strikes, procurement delays, fabrication delays, etc.

- C. Contractor shall be responsible for all costs associated with the preparation of Time Impact Evaluations, and the process of incorporating them into the current schedule update. The Contractor shall provide District with 3 copies of each TIE.
- D. Once agreement between District and Contractor has been reached on a TIE, the Contract time will be adjusted accordingly. If agreement is not reached on a TIE, the Contract time may be extended in an amount District allows, and the Contractor may submit a claim for additional time.
- E. If the Contractor does not submit a TIE within the required seven (7) calendar days for any issue, it is mutually agreed that the Contractor does not require a time extension for said issue.

1.16 TIME EXTENSIONS

- A. The Contractor is responsible for requesting time extensions for time impacts that, in the opinion of the Contractor, impact the critical path of the currently updated BASELINE CPM SCHEDULE.
- B. Contractor shall not be granted an extension of time for failure to obtain necessary approvals for deferral approvals due to failure to comply with laws, building codes, and other regulations (including Title 24 of the California Code of Regulations).
- C. No time extensions will be granted under this Contract for the cumulative effect of changes in the Work.
- D. District will not be obligated to consider any time extension request unless requirements of Contract Documents have been met.
- E. Failure of the Contractor to perform in accordance with the currently updated BASELINE CPM SCHEDULE Update shall not be excused because of submittal of a time extension request.
- F. Where an event for which District is responsible impacts the projected Contract Substantial Completion date of the Work, or any phase of the Work, the Contractor shall provide a written mitigation plan, including a schedule diagram, which explains how (e.g., increase crew size, overtime, etc.) the impact can be mitigated. The Contractor shall also include a detailed cost breakdown of the labor, equipment, and material the Contractor would expend to mitigate District caused time impact. The Contractor shall submit its mitigation plan to District within seven (7) calendar days from the date of discovery of said impact. The Contractor is responsible for the cost to prepare the mitigation plan.
- G. Contractor’s failure to a request time extension, provide a TIE, or provide the required mitigation plan will result in Contractor waiving its right to both a time extension and to recovering any costs to mitigate the delay.

PART 2 - PRODUCTS - Not applicable to this section.

PART 3 - EXECUTION - Not applicable to this section.

END OF SECTION 01 32 13

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SECTION 01 32 33
PHOTOGRAPHIC DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. All Contract Documents shall be reviewed for applicable provisions related to the provisions in this document, and provisions in the General Conditions and other Division 1 Specification Sections shall apply to this Section without limitation.

1.2 RELATED REQUIREMENTS SPECIFIED IN OTHER SECTIONS

- A. Section 01 11 00 – “Summary of Work”
- B. Section 01 14 00 – “Work Restrictions”
- C. Section 01 33 00 – “Submittal Procedures”
- D. Section 01 77 00 – “Closeout Procedures”
- E. Section 01 79 00 – “Demonstration and Training”
- F. Divisions 2 through 41 sections for Photographic Documentation requirements for the work in these sections.

1.3 SUMMARY

- A. This section specifies administrative and procedural requirements for the following:
 - 1. Preconstruction digital photographs.
 - 2. Preconstruction video
 - 3. Final completion construction digital photographs.

1.4 COSTS OF PHOTOGRAPHY, PRINTING AND WEB CAM SYSTEM

- A. Contractor shall pay all costs for specified photography and prints.

1.5 SUBMITTALS

- A. Qualification Data: Contractor shall provide a person with experience for taking digital photographs.
- B. Key Plan: Submit key plan of Project site and building with notation of vantage points marked for location and direction of each (photograph.)
- C. Construction Photographs: Submit (15) digital photographs each month, and (25) digital photographs at the end of Project completion.
 - 1. Digital Images: Submit a complete set of digital image electronic files, CD/DVD, (with each submittal of prints as a Project Record Document). Identify electronic media with date photographs were taken. Submit images that have the same aspect ratio as the sensor, un-cropped.
- D. Time lapse Construction Web Cam Photos and Movie: Not used

PART 2 - PRODUCTS

2.1 PHOTOGRAPHIC MEDIA

- A. Digital Images: Provide images in JPEG format, with minimum sensor size of 10.0 megapixels.
- B. Video Format: Provide digital color video – CD/DVD Format.

2.2 TIME LAPSE - Not used

PART 3 - EXECUTION

3.1 PHOTOGRAPHS, GENERAL

- A. Date Stamps: Unless otherwise indicated, date and time stamp each photograph as it is being taken so stamp is integral to photograph.

3.2 TIME LAPSE CONSTRUCTION WEB CAM - Not used

3.3 EXISTING CONDITIONS SURVEY VIDEO

- A. Prior to commencement of Work on Site, jointly survey the existing and surrounding areas and structures with the District and Architect. Contractor shall note and recording existing damage such as cracks, sags, and other damage, on Site Plan/Floor Plans as appropriate.
- B. This record shall serve as a basis for determination of subsequent damage to these items due to settlement, movement, demolition, or other Contractor operations.
- C. Existing damage observed shall be marked and the completed record of existing damage shall be signed by the parties.
- D. Cracks, sags, and damage to the area and other items not noted in the original survey but subsequently observed shall be reported immediately to the Architect.
- E. Contractor shall comply with requirements of this Section for photographic and/or video recording of existing conditions.

3.4 PRECONSTRUCTION PHOTOGRAPHS

- A. Before starting construction, take color digital photographs of Project site and surrounding properties from different vantage points, as directed by and Architect and District.
- B. Take photographs as necessary to show existing conditions adjacent to the building, spaces, and property before starting the work.
- C. Take necessary photographs of existing buildings either on or adjoining the building, spaces, and property to accurately record the physical conditions prior to the start of construction.

3.5 CONSTRUCTION VIDEOS, GENERAL

- A. Recording: Mount camera on tripod before starting recording, unless otherwise necessary to show area of construction for maintenance and operation. Display continuous running time.

END OF SECTION 01 32 33

**SECTION 01 32 50
DELAY AND EXTENSIONS TO THE WORK**

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. All Contract Documents shall be reviewed for applicable provisions related to the provisions in this document, and provisions in the General Conditions and other Division 1 Specification Sections shall apply to this Section without limitation.

1.2 RELATED REQUIREMENTS SPECIFIED IN OTHER SECTIONS

- A. Section 01 11 00 – “Summary of Work”
- B. Section 01 32 13 – “Construction Scheduling of Work”
- C. Section 01 31 00 – “Project Management and Coordination”
- D. Divisions 2 through 41 Sections for Delay and Extensions to the Work requirements for the work in those Sections.

1.3 SUMMARY

- A. This Section includes administrative and procedural requirements for evaluation of excusable delays including delays due to abnormal or adverse weather conditions.

1.4 DELAYS AND EXTENSIONS TO THE WORK

- A. Contractor must complete all Work within the time specified in these Contract Documents. The Contractor will be granted an extension of time and will not be assessed liquidated damages or the cost of engineering and inspection for any delay in substantially completing the Work (or parts thereof) beyond the time set elsewhere in the Contract Documents, provided that such delay was caused by unforeseeable causes beyond the control and without the fault or negligence of the Contractor. Examples of such causes include fire, floods, abnormal weather (as described below), and earthquakes, embargoes, changes made pursuant to the provisions of “Changes in work” elsewhere in the Contract Documents or acts or neglect of the District not contemplated by the Contract Documents. In all cases, any extension of time is conditioned on the following:
 1. That the cause is not due to the fault or negligence of the Contractor, and the Contractor has taken reasonable precautions to prevent the delays and minimize the effects thereof; and
 2. That the Contractor notifies the District, Architect, Project Manager, and project Inspector in writing within five (5) days from the beginning of such delay, specifying the nature of the delay and the measures that have been or will be taken to prevent or minimize the delay. Failure to submit written notice within this time period shall constitute an absolute waiver of any claim for a time extension.

- B. No extension of time will be granted for a delay caused by a shortage of materials, unless the Contractor furnishes to the District documentary proof that he has diligently made every effort to obtain such materials from all known sources within reasonable distance of the work and further proof, in the form of schedule data as required in Section 01310 that the inability to obtain such materials as originally planned did in fact cause a delay in final completion of the Work which could not be compensated for by revising the sequence of the Contractor's operations. Only the physical shortage of material will be considered as a cause for extension of time, and no consideration will be given to any claim that material could not be obtained at a reasonable, practical or economical cost or price, unless it is shown to satisfaction of the District that such material could have been obtained only at exorbitant prices, taking into account the quantities involved and the usual practices in obtaining such quantities.
- C. The term "shortage of materials," as used in this section, shall apply only to materials, articles, parts or equipment which are standard items and shall not apply to materials, parts, articles or equipment which are processed, made, constructed, fabricated or manufactured to meet the specific requirements of the Contract Documents.
- D. No extensions of time will be granted for delay that have no measurable impact on the completion of the Work (or parts thereof) under the Contract Documents. When extensions of time are granted, they will be limited to the period equivalent to the actual number of days lost on the critical path or controlling operations of the current approved Construction Schedule, taking into account the extent to which that delay could be decreased by reasonable mitigation measures by the Contractor. All requests for extensions of time must be supported with a critical path analysis showing the critical path and impacts to it. Contractor's failure to submit this analysis will be sufficient cause for denial of any request for a time extension.
- E. Within a reasonable period of time after the Contractor submits the notice of delay along with any other information required by this section, the District will determine whether an extension of time is justified and, if so, the number of days for the extension.

1.5 ABNORMAL OR ADVERSE WEATHER CONDITIONS

- A. For the purposes of this Project, the Contractor shall include within the Contract Time of its Baseline CPM Schedule an allowance of **40 work days as a bank**, just prior to its Substantial Completion date milestone activity, **and 20 work days prior to Final Completion** of the Demolition work, for normally anticipated adverse weather. The allowance will be reduced pursuant to the procedures noted in this Section for abnormal weather. In the event this allowance is consumed, a non-compensable time extension for abnormal weather will be granted pursuant to the procedures of this Section. If this allowance is not consumed by normal adverse weather, the remaining work days will be considered project float as defined in Section 01 32 13, Construction Scheduling of Work.
- B. In addition, before a time extension may be granted for abnormal weather, Contractor must establish to District satisfaction that the rain either significantly impacted at least 75% of the planned work of the critical path operations for a particular day or prohibited at least five (5) hours of work on the critical path operations planned for that day.
- C. In the event that the project experiences favorable weather for a particular month (e.g. a number of actual rain days less than that allocated for allowable rain days per month), the cumulative float resulting from such favorable weather shall accrue to the project.
- D. Rain delay shall be only for the actual period of time established pursuant to full compliance with the above requirements.

- E. Contractor shall take reasonable steps to mitigate potential weather delays, such as dewatering the Site, providing access roads that are stable under abnormal or adverse weather conditions, and covering work and material that could be affected adversely by weather. Failure to do so shall be cause for the District to not grant a time extension due to abnormal or adverse weather, where Contractor could have avoided or mitigated the potential delay by exercising reasonable care.
- F. Abnormal weather may be a valid basis for a time extension under the Contract. The term “abnormal weather” is defined as the occurrence rain conditions that exceed the criteria set forth that cause impact to Contractor’s operations.
- G. Contractor shall employ reasonable methods to mitigate the impact of abnormal weather (i.e. dewatering, protection of site, etc.) The occurrence of rain during non-work hours or having minimal impact to work on the controlling operation shall not constitute a day of abnormal weather.

1.6 ENTITLEMENT TO CLAIM FOR DELAY AND EXTENSIONS TO THE WORK

- A. Any Contractor claim for damages or additional compensation based on delay shall be limited to only those circumstances where the Contractor has fulfilled at least one of the following three (3) requirements:
 - 1. Contractor has established its entitlement to a time extension pursuant to the provisions described above regarding delay and extensions to the Work.
 - 2. The delay was caused solely by the District by District’s issuance of changes made pursuant to the provisions of “Changes in Work” elsewhere in these General Conditions or by acts of neglect of the district.
 - 3. The delay was unreasonable under the circumstances and not within the contemplation of the parties and/or the Contract Documents.
- B. It is expressly understood and agreed that delays caused by the District will be non-compensable when there are concurrent delays caused by the Contractor. Also, Contractor shall have no entitlement to additional compensation for any delay where there have been concurrent delays caused by non-compensable delays, including, but not limited to, fire, floods, tidal waves, earthquakes, epidemics, quarantine restrictions, strikes, labor disputes and freight embargoes weather days.
- C. In the event that the Contractor submits a claim for additional costs associated with overhead, the Contractor shall, within 60 calendar days of the District’s written request, submit to the District an audit examination and report performed by an independent Certified Public Accountant certifying the Contractor’s actual unanticipated overhead costs. The independent Certified Public Accountant’s audit examination shall be performed in conformance with the requirements of the American Institute of Certified Public Accountants Attestation Standards. The audit examination and report shall depict the Contractor’s project and company-wide financial records and shall specify the actual overall average daily rates for both field and home office overhead for the entire duration of the project, and whether the costs have been properly allocated. The rates of field and home office overhead shall exclude all unallowable costs as determined in the Federal Acquisition Regulations, 48 CFR, Chapter 1, Part 31. The audit examination shall determine if the rates of field and home office overhead;
 - 1. Are allowable in conformance with the requirements of the Federal Acquisition Regulations, 48 CFR, Chapter 1, Part 31;

2. Are adequately supported by reliable documentation; and
 3. Related solely to the project under examination.
- D. Upon the District's written request, the Contractor shall make its financial records available for audit by the District for the purpose of verifying the actual rate of overhead specified in the audit submitted by the Contractor. The overhead specified in the audit, submitted by the Contractor, will be subject to review and approval by the District.

PART 2 – PRODUCT

Not Used.

PART 3 – EXECUTION

Not Used.

END OF SECTION 01 32 50

**SECTION 01 33 00
SUBMITTAL PROCEDURES**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. All Contract Documents shall be reviewed for applicable provisions related to the provisions in this document, and provisions in the General Conditions and other Division 1 Specification Sections shall apply to this Section without limitation.

1.2 RELATED DOCUMENTS SPECIFIED IN OTHER SECTIONS

- A. Section 01 11 00 – “Summary of Work”
- B. Section 01 14 00 – “Work Restrictions”
- C. Section 01 29 00 – Payment Procedures”
- D. Section 01 32 13 – “Scheduling of Work”
- E. Section 01 31 80 – “Document Management System”
- F. Section 01 45 00 – “Quality Control”
- G. Section 01 43 39 – “Mockups”
- H. Section 01 77 00 – “Closeout Procedures”
- I. Section 01 78 39 – “Project Record Documents”
- J. Section 01 79 00 – “Demonstration and Training”
- K. Divisions 2 through 41 sections for Submittal Procedures requirements for the work in these sections

1.3 SUMMARY

- A. This Section includes administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other Submittals.

1.4 DEFINITIONS

- A. Action Submittals, as used herein are written and/or graphic information that requires Architect and/or District responsive action. Submittals may be rejected for not complying with requirements. Prepare and submit Action Submittals as required by individual Specification Sections.
- B. Informational Submittals, as used herein are written and/or graphic information that does not require Architect responsive action. Submittals may be rejected for not complying with requirements. Prepare and submit Informational Submittals as required by individual Specification Sections.
- C. Manufactured, as used herein applies to standard units usually mass-produced, and “fabricated” means items specifically assembled or made out of selected materials to meet individual design requirements.

- D. Submittal Descriptions. Submittals requirements are specified in the technical sections. Submittals are identified by description as follows:
1. Preconstruction Submittals, as used herein are submittals which are required following a Notice to Award and prior to commencing Work on Site. Examples include, but are not limited to:
 - a. Initial CPM Schedule
 - b. Submittal Log (listing submittal schedule, including shop drawings and samples)
 - c. Initial Schedule of Values
 - d. Safety Plan (For Information Only)
 - e. Waste Management Plan
 - f. Quality Control Plan
 - g. Others as required by the Contract Documents
 2. Shop Drawings, as used herein are drawings, diagrams, schedules, and other data, which are prepared by Contractor, Subcontractors, manufacturers, fabricators, suppliers, or distributors illustrating some portion of the Work, and include: illustrations; fabrication, erection, layout and setting drawings; manufacturer's standard drawings; schedules; descriptive literature, instructions, catalogs, and brochures; performance and test data including charts; wiring and control diagrams; and all other drawings and descriptive data pertaining to materials, equipment, piping, duct and conduit systems, and methods of construction as may be required to show that the materials, equipment, or systems and their position conform to the requirements of the Contract Documents.
 - a. Shop drawings shall establish the actual detail of all manufactured or fabricated items, indicate proper relation to adjoining work, amplify design details of mechanical and electrical systems and equipment in proper relation to physical spaces in the structure, and incorporate minor changes of design or construction to suit actual conditions. However, changes meeting the definition of DSA Construction Change Document Category A require DSA review and approval and shall be submitted by the Architect of Record to DSA as a Construction Change Document in accordance with IR A-6.
 3. Product data, as used herein are catalog cuts, illustrations, standard schedules, performance charts, instructions, brochures, diagrams, and other information furnished by the Contractor to illustrate a material, product, or system for some portion of the Work. This includes samples of warranty language when the contract requires extended product warranties.
 4. Samples, as used herein are physical examples furnished by Contractor to illustrate materials, equipment, or quality and includes natural materials, fabricated items, equipment, devices, appliances, or parts thereof as called for in the Specifications, and any other samples as may be required by the Architect to determine whether the kind, quality, construction, finish, color, and other characteristics of the materials, etc., proposed by the Contractor conform to the required characteristics of the various parts of the Work. All Work shall be in accordance with the approved samples.
 5. Design Data, as used herein are design calculations, mix designs, analyses or other data pertaining to a part of Work.

6. Test Reports, as used herein, include:
 - a. Reports signed by authorized official of testing laboratory that a material, product or system identical to the material, product or system to be provided has been tested in accord with specified requirements. (Testing must have been within three years of date of contract award for the project.)
 - b. Reports which include findings of a test required to be performed by the Contractor on an actual portion of the work or prototype prepared for the project before shipment to job site.
 - c. Reports which include findings of a test made at the job site or on sample taken from the job site, on portion of work during or after installation.
 - d. Investigation reports.
 - e. Daily performance logs.
 - f. Manufacturer or Installer checklists.
 - g. Manufacturer's Factory or Field Reports, including documentation of the testing and verification actions taken by manufacturer at the factory or manufacturer's representative at the job site, in the vicinity of the job site, or on a sample taken from the job site, on a portion of the work, during or after installation, to confirm compliance with manufacturer's standards or instructions. The documentation must be signed by an authorized official of a testing laboratory or agency and must state the test results; and indicate whether the material, product, or system has passed or failed the test.
 - h. Final acceptance test and operational test procedure.
7. Manufacturer's Instructions. Preprinted material describing installation of a product, system or material, including special notices, checklists, and Material Safety Data sheets concerning impedances, hazards and safety precautions.
8. Operation and Maintenance Data. Data that is furnished by the manufacturer or the system provider to the equipment operating and maintenance personnel, including manufacturer's help and product line documentation necessary to maintain and install equipment. This data is needed by District operating and maintenance personnel for the safe and efficient operation, maintenance and repair of the item. This data is intended to be incorporated in the Operations and Maintenance manual submittals.
9. Closeout Submittals. Documentation to record compliance with technical or administrative requirements in order to meet all requirements necessary to properly close out the Construction Contract. These include, but are not limited to:
 - a. Record Drawings
 - b. As-built drawings
 - c. Others as required by the Contract Documents.

1.5 PREPARATION AND FORMAT

- A. Transmit each submittal, except sample installations and sample panels to the District in accordance with Section 01 31 80 (Document Management System). If the District, the Architect, and the Contractor mutually agree, submittals from the Contractor may be transmitted to the

District and the Architect at the same time. However, following review by the Architect-Engineer team, submittals shall be transmitted back to the District Construction Manager prior to further distribution.

- B. Transmit submittals with transmittal form prescribed by District and standard for the Project as described below.
1. On the transmittal form identify Contractor, indicate date of submittal, and include information prescribed by transmittal form and required in paragraph entitled "Identifying Submittals." Process transmittal forms to record actions regarding sample[s].
- C. Identifying Submittals. When submittals are provided by a Subcontractor, the Contractor shall prepare, review and stamp with Contractor's approval stamp all specified submittals prior to submitting for District approval. Identify submittals, except sample installations and sample panels, with the following information permanently adhered to or noted on each separate component of each submittal and noted on transmittal form. Mark each copy of each submittal identically, with the following:
1. District Project Number and title.
 2. Construction contract number.
 3. Date of the drawings and revisions.
 4. Product identification and location in project.
 5. Name, address, and telephone number of subcontractor, supplier, manufacturer and any other second tier Contractor associated with submittal.
 6. Section number of the specification section which requires the submittal.
 7. When a resubmission, add numeric revision suffix on submittal description, for example, submittal 18 would become 18R1, to indicate resubmission.
- D. Format for Shop Drawings
1. Submit electronic PDF and (3) hard copies. Refer to Section 01 31 80 (Document Management System) for electronic submittal requirements.
 2. Shop drawings are not to be less than 8 1/2 by 11 inches nor more than 30 by 42 inches, except for full size patterns or templates. Prepare drawings to accurate size, with scale indicated, unless other form is required. Prepare drawings that will be submitted to Division of State Architect (DSA) noted as Deferred Approval in the bid drawings and specifications as mandated by DSA.
 3. Drawings are to be suitable for reproduction and be of a quality to produce clear, distinct lines and letters with dark lines on a white background.
 4. Present 8 1/2 by 11 inches sized shop drawings as part of the bound volume for submittals required by section. Present larger drawings in sets.
 5. Include on each drawing the drawing title, number, date, and revision numbers and dates, in addition to information required in paragraph entitled "Identifying Submittals."
 6. Number drawings in a logical sequence. Each drawing is to bear the number of the submittal in a uniform location adjacent to the title block. Place the District Project name and number in the margin, immediately below the title block, for each drawing.

7. Reserve a blank space on the right-hand side of each sheet for the Architect's disposition stamp.
 8. Dimension drawings, except diagrams and schematic drawings and prepare drawings demonstrating interface with other trades to scale. Use the same unit of measure for shop drawings as indicated on the contract drawings. Identify materials and products for work shown.
 9. Include the nameplate data, size and capacity on drawings. Also include applicable federal, military, industry and technical society publication references.
- E. Format of Product Data and Manufacturer's Instructions
1. Refer to Section 01 31 80 (Document Management System) for electronic submittal requirements.
 2. Present product data submittals for each section as a complete, bound volume. Include table of contents, listing page and catalog item numbers for product data.
 3. Indicate by prominent notation each product which is being submitted; indicate specification section number and paragraph number to which it pertains.
 4. Supplement product data with material prepared for Project to satisfy submittal requirements for which product data does not exist. Identify this material as developed specifically for project, with information and format as required for submission of Certificates.
 5. Include the manufacturer's name, trade name, place of manufacture, and catalog model or number on all product data. Also include applicable industry and technical society publication references. Should manufacturer's data require supplemental information for clarification, include such information in the submittal.
 6. Where equipment or materials are specified to conform to industry and technical society reference standards of the organizations such as American National Standards Institute (ANSI), ASTM International (ASTM), National Electrical Manufacturer's Association (NEMA), Underwriters Laboratories (UL), and Association of Edison Illuminating Companies (AEIC), submit proof of such compliance. The label or listing by the specified organization will be acceptable evidence of compliance.
 - a. In lieu of the label or listing, submit a certificate from an independent testing organization, competent to perform testing, and approved by the District Project Manager. State on the certificate that the item has been tested in accordance with the specified organization's test methods and that the item complies with the specified organization's reference standard.
 7. Collect required data submittals for each specific material, product, unit of work, or system into a single submittal and marked for choices, options, and portions applicable to the submittal. Mark each copy of the product data identically. Partial submittals will not be accepted for expedition of construction effort.
 8. Submit manufacturer's instructions prior to installation.
- F. Format of Samples
1. Furnish samples in sizes below, unless otherwise specified or unless the manufacturer has prepackaged samples of approximately same size as specified:

- a. Sample of Equipment or Device: Full size.
 - b. Sample of Materials Less Than 2 by 3 inches: Built up to 8 1/2 by 11 inches.
 - c. Sample of Materials Exceeding 8 1/2 by 11 inches: Cut down to 8 1/2 by 11 inches and adequate to indicate color, texture, and material variations.
 - d. Sample of Linear Devices or Materials: 10 inch length or length to be supplied, if less than 10 inches. Examples of linear devices or materials are conduit and handrails.
 - e. Sample of Non-Solid Materials: Pint. Examples of non-solid materials are sand and paint.
 - f. Color Selection Samples: 2 by 4 inches. Where samples are specified for selection of color, finish, pattern, or texture, submit the full set of available choices for the material or product specified. Sizes and quantities of samples are to represent their respective standard unit.
 - g. Sample Panel: 4 by 4 feet.
 - h. Sample Installation: 100 square feet.
2. Samples Showing Range of Variation: Where variations in color, finish, pattern, or texture are unavoidable due to nature of the materials, submit sets of samples of not less than three units showing extremes and middle of range. Mark each unit to describe its relation to the range of the variation.
 3. Reusable Samples: Incorporate returned samples into work only if so specified, indicated, or approved by Architect and District. Incorporated samples are to be in undamaged condition at time of use.
 4. Recording of Sample Installation: Note and preserve the notation of area constituting sample installation but remove notation at final clean-up of project.
- G. Format of Design Data and Certificates.
1. Refer to Section 01 31 80 (Document Management System) for electronic submittal requirements.
 2. Provide design data and certificates on 8 1/2 by 11 inches paper. Provide a bound volume for submittals containing numerous pages.
- H. Format of Test Reports and Manufacturer's Field Reports
1. Refer to Section 01 31 80 (Document Management System) for electronic submittal requirements.
 2. Provide reports on 8 1/2 by 11 inches paper in a complete bound volume.
 3. Indicate by prominent notation, each report in the submittal. Indicate specification number and paragraph number to which it pertains.
- I. Format of Operation and Maintenance Data shall comply with the requirements specified in Section 01 78 23 "Operation and Maintenance Data" for O&M Data format.
- J. Format of Preconstruction Submittals and Closeout Submittals.
1. When submittal includes a document which is to be used in Project or become part of Project Record, other than as a submittal, do not apply Contractor's approval stamp to document, but to a separate sheet accompanying document.

2. Provide all dimensions in English units only.

1.6 QUANTITY OF SUBMITTALS

- A. Number of Copies of Shop Drawings – (3) hard copies and an electronic PDF file. Submit in compliance with the following requirements:
 1. Refer to Section 01 31 80 (Document Management System) for electronic submittal requirements.
 2. Submittals that require local and State agency approval, shall conform with this Specification and the requirements of the local or State agency.
- B. Contractor shall receive one (1) reviewed electronic PDF file of the submittal. Contractor shall be responsible for providing copies to its subcontractors.
- C. Number of Copies of Product Data and Manufacturer's Instructions. Submit in compliance with quantity requirements specified for shop drawings.
- D. Number of Samples
 1. Submit three (3) sets of samples showing range of variation, of each required item. Two approved samples or sets of samples will be retained by District and one will be returned to Contractor.
 2. Submit one sample panel or provide one sample installation where directed. Include components listed in technical section or as directed.
 3. When required by Contract Documents, provide one sample installation where directed by Architect or District.
- E. Number of Copies Design Data and Certificates. Submit in compliance with quantity requirements specified for shop drawings.
- F. Number of Copies Test Reports and Manufacturer's Field Reports. Submit in compliance with quantity and quality requirements specified for shop drawings.
- G. Number of Copies of Operation and Maintenance Data. Submit three (3) copies of O&M Data to the District Project Manager for review and approval.
- H. Number of Copies of Preconstruction Submittals and Closeout Submittals. Unless otherwise specified, submit as required for shop drawings.

1.7 SUBMITTALS, GENERAL

- A. Contractor shall obtain and shall submit all required shop drawings, samples, technical data, and other submittals as required by the Contract Documents with such promptness as to cause no delay in its own Work or in that of any other contractor or subcontractor.
 1. As required by the Contract Documents, the Contractor shall obtain and submit with shop drawings all seismic and other calculations, and all product data from equipment manufacturers.
 2. No shop drawing submittals shall be reviewed until coordinated documents per paragraph 1.13.C.1.b and c have been submitted, reviewed and signed off by representatives of each of the sub-contractors.

- B. Prepare a complete Submittal Log and maintain it as the Work progresses. Submit the initial Submittal Log for approval by District at the same time as the Initial Schedule (See Section 01 32 13 Construction Scheduling). Include the Contractor's anticipated submission dates and the approval needed dates (if approval is required).
 - 1. Re-submit submittal log and annotate monthly by the Contractor with actual submission and approval dates. When all items on the log have been fully approved, no further re-submittal is required.
 - 2. Carefully control procurement operations to ensure that each individual submittal is made on or before the Contractor scheduled submittal date shown on the approved "Submittal Log."
 - 3. Except as specified otherwise, allow review period of at least fifteen (15) working days for submittals requiring Architect or District approval. Period of review for submittals requiring approval begins when District receives submittal from Contractor.
 - 4. For submittals requiring review by fire protection engineer and/or DSA, allow review period, beginning when District receives submittal thirty (30) calendar days for return of submittal to the Contractor.
 - 5. Period of review for each resubmittal is the same as for initial submittal.
- C. The District may request submittals in addition to those specified when deemed necessary to adequately describe the work covered in the respective sections.
- D. Units of weights and measures used on all submittals are to be the same as those used in the contract drawings.
- E. Each submittal is to be complete and in sufficient detail to allow ready determination of compliance with contract requirements.
- F. No extensions of time will be granted to Contractor or any Subcontractor because of its failure to have shop drawings, samples, product data and/or other required submittals submitted in accordance with the approved Submittal Log and Master Construction Schedule.
- G. Each Subcontractor shall submit all shop drawings, samples, product data and other required submittals for the review by the District and the Architect through the Contractor.
- H. By submitting shop drawings, samples, product data and other required submittals, the Contractor represents that it has determined and verified all materials, field measurements, catalog numbers, related field construction criteria, and other relevant data in connection with each such submission, and that it has checked, verified, and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents, including the construction schedule.
- I. Quality Control Certification. Stamp each sheet of each submittal with a quality control certifying statement, except that data submitted in bound volume or on one sheet printed on two sides may be stamped on the front of the first sheet only. When approving authority is Architect or District, Contractor shall certify submittals with the following certifying statement:

"I hereby certify that the (equipment) (material) (article) shown and marked in this submittal is that proposed to be incorporated with contract Number [____], is in compliance with the Contract Documents, does not constitute an unapproved

substitution, deviation, or variation, can be installed in the allocated spaces, and is submitted for District approval.

I further certify that I have reviewed and approved the field dimensions and the construction criteria, and have also made written notation regarding any information in the shop drawings that does not fully conform to the Contract Documents. This submittal has been coordinated with all other submittals received to date, and this duty of coordination has not been delegated to subcontractors, material suppliers, the Architect, or the Engineers on this project.

For the Contractor:

Certified by Submittal Reviewer _____, Date _____
(Signature)

Certified by QC Manager _____, Date _____
(Signature)

- J. Partial submittals are not acceptable, will be considered non-responsive, and will be returned without review by either District or Architect. Mark each copy of each submittal to show which products and options are applicable.
- K. The submission of the shop drawings, samples, product data and other required submittals, shall not deviate from the requirements of the Contract Documents including detailing and design intent which is specifically outlined in Contract Documents except as specifically authorized by the Architect or through an accepted substitution, per the requirements of the Contract Documents.
- L. Deviations from the Contract Documents
 - 1. Any deviations from the Contract Documents shall be fully described in a transmittal accompanying the shop drawings, samples, product data and other required submittals. However, such submittals shall not be used as a means of requesting a substitution, the procedure for which is defined elsewhere in the Contract Documents. In addition, ALL deviations meeting the definition of DSA Construction Change Document Category A, per DSA IR A-6, are subject to DSA review and require submittal to and approval by DSA as a Construction Change Document. The Contractor shall be responsible for any delays or costs incurred due to Contractor requested or generated deviations requiring the preparation of a DSA Construction Change Document.
 - 2. Architect and District approval is required for any proposed deviation from the accepted design which still complies with the Contract Documents before the Contractor is authorized to proceed with material acquisition or installation. If necessary to facilitate the project schedule, the Contractor and the Architect may discuss a submittal proposing a deviation with the District Project Manager prior to officially submitting it to the District. However, the District reserves the right to review the submittal before providing an opinion, if deemed necessary. In any case, the District will not formally agree to or provide

- a preliminary opinion on any deviation without either the Architect's approval or recommended approval.
3. The District reserves the right to reject any deviation which may impact furniture, furnishings, equipment selections, and/or operations decisions that were made previously and based on the District reviewed and approved Project design.
 4. Contractor is responsible for the dimensions and construction of work. Failure to point out deviations may result in the District requiring rejection and removal of such work at the Contractor's expense.
 5. After submittals have been accepted by the Architect, no resubmittal for the purpose of substituting materials or equipment will be considered unless accompanied by an explanation of why a substitution is necessary.
- M. Review by District and Architect shall not relieve the Contractor or any Subcontractor from its responsibility in preparing and submitting proper submittals in accordance with the Contract Documents.
- N. Any submission, which in Architect's opinion is incomplete, contains errors, or been superficially checked will be returned by the Architect without review for resubmission by the Contractor.
- O. Electronic copies of the stamped and signed Contract Documents will not be provided by District or Architect for Contractor's use unless:
1. Contractor shall first request and obtain written approval from Architect prior to use of any Architect's CAD files, drawings, or other documents for submittal purposes.
 2. Contractor shall be responsible for all reproduction, printing, and delivery cost associated with the use of any requested drawings and/or CAD files.
 3. Contractor provides disclaimer letters to the Architect and District (15) working days in advance of any proposed use of Architect's documents and/or digital files. Such disclaimer letter shall be in a form acceptable to Architect and District.
 4. Contractor shall not reuse any Architect's documents and/or electronic files for submittal purposes without prior written approval.
- P. Coordinate preparation and processing of submittals with performance of construction activities.
1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination. The Contractor shall ensure Mechanical, Electrical, and Plumbing (MEP) sub-contractors provide coordinated and comprehensive submittals for all integrated systems. Multiple submittal packages will not be allowed and will be returned without review or action. No extension of Contract Time will be authorized due to incomplete or uncoordinated Contractor submittals.
 - a. Architect and District reserve the right to withhold action on, or return without review, a submittal requiring coordination with other submittals until all such related submittals are received. No extension of the Contract Time will be authorized.

- b. Architect and District will return incomplete submittals to the Contractor without review. No extension of Contract Time will be authorized due to incomplete Contractor submittals.
- Q. Submittals Schedule: Comply with requirements in Section 01 32 13 (Scheduling of Work) in planning for required submittals and relating them to scheduled construction activities.
- 1. Initial Review: Allow fifteen (15) working days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will, through the Construction or Project Manager, advise Contractor when a submittal review must be delayed for coordination reasons.
 - 2. Intermediate Review: If intermediate submittal review is necessary, process it in the same manner as an initial submittal.
 - 3. Re-submittal Review: Allow ten (10) working days for review of each re-submittal.
 - 4. Sequential Review: Where sequential review of submittals by Architect's consultants, District, or other parties is indicated, allow fifteen (15) working days for initial review of each submittal.
 - 5. DSA Deferred Approvals Review: see paragraph 1.13 D.18 for detailed procedures
- R. Re-submittals: Make re-submittals in same form and number of copies as initial submittal.
- 1. Note date and content of previous submittal.
 - 2. Note date and content of revision in label or title block and clearly indicate extent of revision(s).
 - 3. Cloud or otherwise highlight and call out **ALL** changes made in each re- submittal.
 - 4. Provide cover letter in each re-submittal, identifying all changes made in each re-submittal.
 - 5. Resubmit submittals until they are marked "No Exceptions Taken" or "Make Corrections Noted" by the Architect.
- S. After submittals have been accepted by the Architect, no resubmittal for the purpose of substituting materials or equipment will be considered unless accompanied by an explanation of why a substitution is necessary.

1.8 ARCHITECT'S REVIEW

- A. Architect's review is for general conformance with design concept only, and does not relieve Contractor in any way from compliance with Contract Documents, nor does it in any way constitute grounds for a Change Order. Contractor remains solely responsible for details and accuracy of all quantities and dimensions, and selection of fabrication and/or installation processes.
- B. The Architect's review shall neither be construed as a complete check which relieves the Contractor, Subcontractor, manufacturer, fabricator, or supplier from responsibility for any deficiency that may exist or from any departures or deviations from the requirements of the Contract Documents unless the Contractor has, in writing, called the Architect's attention to the deviations at the time of submission.
- C. The Architect's review shall not relieve the Contractor or Subcontractors from responsibility for errors of any sort in any required submittals, for proper fitting of the Work, coordination of the

differing subcontractor trades, and Work which is not indicated on any submittal at the time of submission.

- D. In reviewing shop drawings, samples, product data and other required submittals, the Architect will not verify dimensions and field conditions.
- E. The Architect will review and approve shop drawings, samples, product data and other required submittals for aesthetics and for conformance with the design concept of the Work and the Contract Documents.
- F. Architect will review each submittal, make marks to indicate corrections or modifications required, and return it.
- G. Contractor and Subcontractors shall be solely responsible for any quantities which may be shown on either the submittals or the Contract Documents.
- H. Architect will not review submittals that do not bear Contractor's approval stamp and Quality Control Certification Letter, and will return them to the Contractor without review.
- I. Architect will stamp each submittal appropriately to indicate action to be taken, as follows:
 - 1. Action Codes Permitting Use:
 - a. When an action code permitting use is assigned to a submittal, it does not authorize work that does not comply with the requirements of the Contract Documents. Acceptance of the Work will depend on compliance.
 - b. Code AP - Approved: The Work covered by the submittal item may proceed, provided it complies with Contract Document requirements.
 - c. Code AN - Approved as Noted: The Work covered by the submittal item may proceed, provided it complies with the Architect's notations and Contract Document requirements.
 - d. Code AN-R - Approved as Noted - Resubmit: Do not deliver or install the related work until the resubmittal has received Code AP or AN. However, fabrication and other off-site work covered by the submittal item may proceed, at the Contractor's risk, provided it complies with the Architect's notations and Contract Document requirements.
 - 2. Action Code Prohibiting Use:
 - a. Action Code REJ - Not Approved: The Work covered by the submittal item, including purchasing, fabrication, delivery, and other activity, shall not proceed. Revise the submittal item or prepare a new item in accordance with the Architect's notations. Resubmit the corrected or new item without delay; do not permit submittal items marked "Not Approved" to be used. Work incorporating such items will be rejected.
 - 3. Action Code for Items Not Required:
 - a. Action Code X - Not Requested by Contract Documents: The submittal item is not called for by the Contract Documents and is being returned unreviewed by the Architect except to the extent necessary to determine its status.

- J. Informational Submittals: For Architect's information only. Architect will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.
 - 1. Action Code for Information Only:
 - a. Action Code INF - Information Only - Received: The submittal item is not called for a return with a reviewed action code by the Contract Documents and is being returned un-reviewed by the Architect except to the extent necessary to determine its status.
- J. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Architect.
- K. Incomplete submittals are not acceptable, will be considered non-responsive, and will be returned without review.
- L. Architect will return without review or discard submittals received from sources other than the Contractor.
- M. Submittals not required by the Contract Documents may be returned by the Architect without action.

1.9 SUBMITTAL TRANSMITTAL REQUIREMENTS

- A. Submittal Transmittal shall be a PDF file in electronic format. It is recommended, to expedite the submittal review, the electronic form be **uploaded to the document management system** for review to the Architect as early as possible.
 - 1. Submittal Numbering: See below.
 - 2. Contact Information: Full Name, Phone Number and Email Address.
- B. Submittal Definition
 - 1. Each submittal consists of items from only ONE Specifications section.
 - 2. Complete Submittal: If ALL the items required by the Specifications section are listed on one Submittal Form (including continuation sheet), it is a complete submittal.
 - 3. Partial Submittals: If it is necessary to divide the required items of a given Specifications section into two or more submittals to meet schedule or handling requirements, the separate submittals are partial submittals. All partial submittals have the same submittal number, and are differentiated by sequential P-numbers (see below).
 - 4. All items in each submittal, whether complete or partial, will be processed together: Individual items will not be 'broken out' for special handling. Arrange submittals accordingly.
- C. Submittal Numbering
 - 1. Number submittals as described below to assist tracking.
 - 2. Number each submittal in the format nnnnnn-nn.

- a. The 6-digit number is the number of the section that requires the submittal. For example, 044200.
- b. The 2-digit number is based on the numerical sequence of submittals from that section. In other words, for each section, the first submittal is 01, the second is 02, and so on. The 2-digit number does not change for partial or re-submittals, so that the submittal can be tracked.
- c. P-Number for Partial Submittals: Number each partial submittal in the **P** space, beginning with P1, and increasing by one for each partial submittal of that submittal. If the submittal is a complete submittal, leave the P space blank.
- d. R-Number for Re-submittals: Number each re-submittal in the **R** space, beginning with R1, and increasing by one for each re-submittal of that submittal. Do not include an R-Number for the initial submittal.
- e. Examples:
 - 1) Initial Complete Submittal: 044200-01. First Re-Submittal: 044200-01-R1.
 - 2) Initial Partial Submittal: 044200-01-P1. Second Partial Submittal: 0044200-01-P2. First Re-submittal of Second Partial Submittal: 044200-R1-P2.

1.10 REJECTED SUBMITTALS

- A. Contractor shall make corrections required by the Architect and resubmit.
- B. If the Contractor considers any correction or notation on the returned submittals to constitute a change to the contract drawings or specifications, he shall provide notice to the Architect and District.
- C. If changes are necessary to submittals, the Contractor shall make such revisions and submission of the submittals in accordance with the procedures above. No item of work requiring a submittal change is to be accomplished until the changed submittals are approved.

1.11 NO EXCEPTIONS TAKEN OR MAKE CORRECTIONS NOTED SUBMITTALS

- A. Acceptance will not relieve the Contractor of the responsibility for any error which may exist, as the Contractor is responsible for the satisfactory construction of all work.

1.12 NO EXCEPTIONS TAKEN OR MAKE CORRECTIONS NOTED SAMPLES

- A. Acceptance of a sample is only for the characteristics or use named in such acceptance and is not be construed to change or modify any contract requirements. Before submitting samples, the Contractor shall assure that the materials or equipment will be available in quantities required in the project. No change or substitution will be permitted after a sample has been accepted.
- B. Match the accepted samples for Materials and equipment incorporated in the work. If requested, accepted samples, including those which may be damaged in testing, will be returned to the Contractor, at his expense, upon completion of the contract. Samples not accepted will also be returned to the Contractor at its expense, if so requested. Failure of any materials to pass the specified tests will be sufficient cause for refusal to consider, under this contract, any further samples of the same brand or make of that material. District reserves the right to disapprove any material or equipment which previously has proved unsatisfactory in service.

- C. Samples of various materials or equipment delivered on the site or in place may be taken by the District Construction Manager or Project Manager for testing. Samples failing to meet contract requirements will automatically void previous acceptance, and Contractor shall replace such materials or equipment at Contractor expense to meet contract requirements.
- D. Acceptance of the Contractor's samples by the AOR or District does not relieve the Contractor of his responsibilities under the contract.

1.13 WITHHOLDING OF PAYMENT

- A. Payment for materials incorporated in the work will not be made if required approvals have not been obtained.
- B. No payment for materials incorporated in the work will be made if all required Designer of Record or required District approvals have not been obtained.
- C. No payment will be made for any materials incorporated into the work for any conformance review submittals or information only submittals found to contain errors or deviations from the Solicitation or Accepted Proposal.

1.14 SUBMITTAL REQUIREMENTS

- A. Shop Drawings
 - 1. Transmittal Letter and Other Requirements. All shop drawings must be properly identified with the name of the Project and dated, and each lot submitted must be accompanied by a letter of transmittal referring to the name of the Project and to the Specification section number for identification of each item clearly stating in narrative form, as well as “clouding” on the submissions, all qualifications, departures, or deviations from the Contract Documents. Shop drawings, for each section of the Work shall be numbered consecutively and the numbering system shall be retained throughout all revisions. All Subcontractor submissions shall be made through the Contractor. Each drawing shall have a clear space for the stamps of Architect and Contractor.
 - 2. Copies Required. Each submittal shall include one (1) PDF format digital file, of each drawing or schedule, table, cut sheet, etc., including fabrication, erection, layout and setting drawings, and such other drawings as required under the various sections of the Specifications, until final acceptance thereof is obtained. Subcontractor shall submit copies, in an amount as requested by the Contractor, of: (1) manufacturers’ descriptive data for materials, equipment, and fixtures, including catalog sheets showing dimensions, performance, characteristics, and capacities; (2) wiring diagrams and controls; (3) schedules; (4) all seismic calculations and other calculations; and (5) other pertinent information as required by the District or Architect.
 - 3. Corrections. The Contractor shall make all corrections required by Architect and shall resubmit, as required by Architect, corrected digital files of shop drawings or new samples until approved. Contractor shall direct specific attention in writing or on resubmitted shop drawings to revisions other than the corrections required by the Architect on previous submissions. Professional services required for more than one (1) re-review of required submittals of shop drawings, product data, or samples are subject to charge to the Contractor by the District.

4. Approval Prior to Commencement of Work. No portion of the Work requiring a shop drawing or sample submission or other submittal shall be commenced until the submission has been reviewed by Contractor and Architect and approved by Architect unless specifically directed in writing by the Architect. All such portions of the Work shall be in accordance with approved shop drawings and samples.
5. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed detail.
6. Fully illustrate requirements of the Contract Documents. Include the following information, as applicable:
 - a. Dimensions
 - b. Weights and measures
 - c. Identification of products
 - d. Fabrication and installation drawings
 - e. Roughing-in and setting diagrams
 - f. Wiring diagrams showing field-installed wiring, including power, signal, and control wiring
 - g. Electrical power requirements
 - h. Shopwork manufacturing instructions
 - i. Templates and patterns
 - j. Schedules
 - k. Design calculations
 - l. Compliance with specified standards
 - m. Notation of coordination requirements
 - n. Notation of dimensions established by field measurement
 - o. Relationship to adjoining construction clearly indicated
 - p. Seal and signature of California professional engineer or other engineer if specified
 - q. Wiring Diagrams: Differentiate between manufacturer-installed and field-installed wiring
 - r. Other information as necessary or required by the Contract Documents

B. Samples

1. Samples Required. In case a considerable range of color, graining, texture, or other characteristics are anticipated in finished products, a sufficient number of samples of the specified materials shall be furnished by the Contractor to indicate the full range of characteristics which will be present in the finished products; and products delivered or erected without submittal and approval of a full range of samples shall be subject to rejection by the District.
 - a. Except for range samples, and unless otherwise called for in the various sections of the Specifications, samples shall be submitted in duplicate.

- b. All samples shall be marked, tagged, or otherwise properly identified with the name of the submitting party, the name of the Project, the purpose for which the samples are submitted and the date, and shall be accompanied by a letter of transmittal containing similar information, together with the Specification section number. Each tag or sticker shall have clear space for the review stamps of Contractor and Architect.
2. Labels and Instructions. All samples of materials shall be supplied with the manufacturer's descriptive labels and application instructions.
3. Architect's Review. The Architect will review and, if appropriate, approve submissions and will return them to the Contractor with the Architect's stamp and signature applied thereto, indicating the timing for review and appropriate action in compliance with the Contract Documents.
4. Identification: Attach label on unexposed side of Samples that includes the following information:
 - a. Generic description of Sample
 - b. Product name and name of manufacturer
 - c. Sample source
 - d. Number and title of appropriate Specification Section
 - e. District Project name and number
 - f. Contractor's name
 - g. Date of submittal
5. Disposition: Maintain sets of all approved Samples at Project site, available for quality-control comparisons throughout the course of the Project. Sample sets may be used to determine final acceptance of construction associated with each sample or sample set.
 - a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
 - b. Samples not incorporated into the Work, if any, or otherwise designated as District's property, are the property of Contractor.
6. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
 - a. Number of Samples: Submit 6 full sets of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line.
7. Samples for Verification: Where required by the Contract Documents, submit full-size units of Samples, prepared from the same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.

- a. Number of Samples: Unless indicated otherwise, submit six sets of Samples. Architect will retain two Sample sets; remaining four sets will be returned.
 - i) Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
 - ii) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by Sample, submit at least four sets of paired units that show approximate limits of variations.
 - 8. District's Property. All shop drawings, computer disks, annotated specifications, samples, and other submittals shall become the District's property upon receipt by the District or Architect.
- C. Other Submittals
- 1. General: Prepare and submit Submittals required by other Specification Sections.
 - a. Test and Inspection Reports: Comply with requirements specified in Section 01 45 00 Quality Control.
 - b. Coordination Drawings: Comply with requirements specified in Section 01 31 00 Project Management and Coordination.
 - i) Coordination Drawings are required where limited space availability necessitates maximum utilization of space for efficient installation of different components or if coordination is required for installation of products and materials fabricated by separate entities.
 - ii) Contractor shall not start any portion of the Work without approval of coordination submittals from the Architect.
 - c. Coordination Documents (Mechanical, Electrical, and Plumbing)
 - i) Contractor is required to submit Coordinated Mechanical, Electrical, Plumbing Layout Drawings to coordinate installation and location of HVAC ductwork, grilles, diffusers, hydronic piping, fire sprinklers, plumbing, light fixtures and electrical services (including, but not limited to floor boxes, conduits, cable trays, low voltage systems, fire alarm, etc.).
 - ii) Coordinated MEP Layout Drawings are to be composite ¼" equals 1 foot scale drawings that show all services color-coded on a single sheet. Drawings are to be coordinated with structural framing systems and architectural systems (roofing, ceilings, finishes). Section drawings, with detailed elevations above finished floor for ducts, piping, fixtures, etc. are to be included to identify and avoid conflicts.
 - iii) Coordination Documents shall be submitted for review by Architect and engineers prior to submittal of MEP shop drawings.
 - iv) Shop drawings for the systems noted in 1.07.A.2 will not be reviewed before the MEP Coordination Documents are signed off by representatives of each of the Mechanical and Electrical sub-contractors as well as the Contractor.
 - v) Contractor to hold coordination meetings to complete these Coordination Documents, attended by all Mechanical, Electrical, and Plumbing sub-contractors

whose work scope is represented in the Coordination Documents. These meetings shall be scheduled in the CPM Schedule.

- vi) No fabrication work or field installation shall commence before the Coordination Documents are signed off by representatives of each of the Mechanical, Electrical, and Plumbing sub-contractors.
 - vii) See Mechanical, Electrical, and Plumbing Specification Sections for additional requirements.
2. Product Data: Submit manufacturer's printed literature in original form as required in the Contract Documents. Submittal shall include specifications, physical dimensions, and ratings of all equipment. Furnish performance curves for all fans and pumps. Where printed literature describes items in addition to that item being submitted, submitted item shall be clearly marked on submittal and superfluous information shall be crossed out in the same manner on all copies. Equipment submittals shall be complete and include space requirements, weight, electrical and mechanical requirements, performance data, and any supplemental information that may be available or requested.
 3. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
 4. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification (WPS) and Procedure Qualification Report (PQR) on AWS forms. Include names of firms and personnel certified.
 5. Installer Certificates: Prepare written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
 6. Manufacturer Certificates: Prepare written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
 7. Material Certificates: Prepare written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
 8. Material Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
 9. Product Test Reports: Prepare written reports indicating current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
 10. Research/Evaluation Reports: Prepare written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:
 - a. Name of evaluation organization
 - b. Date of evaluation
 - c. Time period when report is in effect

- d. Product and manufacturer's names
 - e. Description of product
 - f. Test procedures and results
 - g. Limitations of use
11. Schedule of Tests and Inspections: Comply with requirements specified in Section 01400 Quality Control Requirements.
 12. Preconstruction Test Reports: Prepare test reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.
 13. Compatibility Test Reports: Prepare test reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.
 14. Field Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
 15. Maintenance Data: Prepare written and graphic instructions and procedures for operation and normal maintenance of products and equipment. Comply with requirements specified in Section 01 78 23 (Operation and Maintenance Data.)
 16. Manufacturer's Installation and Operations Instructions: Prepare written or published information that documents manufacturer's recommendations, guidelines, and procedures for installing or operating a product or equipment. Manufacturer's Instructions shall be available for review on site at all times. Include name of product and name, address, and telephone number of manufacturer. Include the following, as applicable:
 - a. Preparation of substrates
 - b. Required substrate tolerances
 - c. Sequence of installation or erection
 - d. Required installation tolerances
 - e. Required adjustments
 - f. Recommendations for cleaning and protection
 17. Manufacturer's Field Reports: Prepare written information documenting factory-authorized service representative's tests and inspections. Include the following, as applicable:
 - a. Name, address, and telephone number of factory-authorized service representative making report.
 - b. Statement on condition of substrates and their acceptability for installation of product.
 - c. Statement that products at Project site comply with requirements.
 - d. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.

- e. Results of operational and other tests and a statement of whether observed performance complies with requirements.
 - f. Statement whether conditions, products, and installation will affect warranty.
 - g. Other required items indicated in individual Specification Sections.
18. Material Safety data sheets (MSDS): Do not submit MSDS for review. Any submitted MSDS will be returned unreviewed.
19. DEFERRED APPROVALS
- a. Submit detailed plans, specifications and engineering calculations for all deferred approval items to the District. All deferred submittals shall be prepared, signed and stamped by the appropriate State of California licensed engineer.
 - b. Contractor shall comply with DSA EPR procedures for all deferred submittals. See DSA PR 18-04 for additional information.
 - c. Contractor is responsible for all costs to comply with DSA EPR procedures for all deferred submittals.
 - d. Fabrication and installation of deferred approval items shall not be started until detailed plans, specifications and engineering calculations have been accepted by the Architect and approved by the Division of the State Architect.

PART 2 - PRODUCTS: Not used.

PART 3 - EXECUTION: Not used.

END OF SECTION 01 33 00

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**SECTION 01 35 00
SPECIAL PROCEDURES**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. All Contract Documents shall be reviewed for applicable provisions related to the provisions in this document, and provisions in the General Conditions and other Division 1 Specification Sections shall apply to this Section without limitation.

1.2 RELATED REQUIREMENTS SPECIFIED IN OTHER SECTIONS

- A. Section 01 11 00 – “Summary of Work”
- B. Section 01 29 00 – “Payment Procedures”
- C. Section 01 33 00 – “Submittal Procedures”
- D. Section 01 78 36 – “Warranties”
- E. Section 01 78 39 – “Project Record Documents”
- F. Section 01 79 00 – “Demonstration and Training”
- G. Divisions 2 through 41 Sections for Contract Closeout Procedure requirements for the work in those Sections.

1.3 SUMMARY

- A. In Compliance with CEQA requirements, the District will conduct an Initial Study to ascertain if the project may have an effect on the environment. The Initial Study identified potential impacts on the environment. However, all potential impacts of the proposed Project can be avoided or reduced to a less-than-significant level by implementation of the following mitigation measures. Contractor shall conform with the following mitigation measures, including but not limited to, the following:
 - 1. Noise Control Plan
 - 2. Dust Control Plan
 - 3. Traffic Control Plan
 - 4. Spill Prevention, Control and Countermeasure Program
 - 5. Tree Protection Plan
 - 6. Migratory Bird Protection Plan
 - 7. Cultural Resources Protection Plan
- B. In no case shall the restrictions identified in this Section limit the Contractor's responsibility for compliance with all Federal, state, and local safety ordinances and regulations.

1.4 NOISE CONTROL

- A. Definitions

1. Noise is any audible sound which has the potential to annoy or disturb humans, or to cause an adverse psychological or physiological effect on humans.
 2. Daytime refers to the period from 7 AM to 7 PM local time daily, except Sundays and Federal holidays.
 3. Evening refers to the period from 7 PM to 10 PM local time daily, except Sundays and Federal holidays.
 4. Nighttime refers to the period from 10 PM to 7 AM local time daily, as well as all day Sunday and Federal holidays.
 5. Nuisance Noise refers to sound levels that annoy or disturb a reasonable person of normal sensitivities, but do not exceed the noise limits specified herein.
 6. Lot-line refers to the line separating the campus from another parcel or from the street.
 7. Background Noise shall be defined as the measured ambient noise level associated with all existing environmental, transportation, and community noise sources in the absence of any audible construction activity.
 8. dBA shall be defined as the sound level (in decibels referenced to 20 micro-pascals) as measured using the A-weighting network on a sound level meter, in accordance with ANSI S1.4 Standards.
 9. Lmax shall be defined as the maximum measured sound level at any instant in time.
 10. Leq shall be defined as the equivalent sound level, or the continuous sound level that represents the same sound energy as the varying sound levels, over a specified monitoring period.
 11. L10 shall be defined as the sound level exceeded 10 percent of the time for a specified monitoring period.
 12. Slow specifies a time constant or 1 second for the root-mean-square (RMS) detector used by a sound level meter, in accordance with ANSI S1.4 Standards.
 13. Impact noise is noise produced from impact or devices with discernible separation in sound pressure maxima. Examples for impact equipment include, but are not limited to; blasting, clam shovel or chisel drops, pavement breakers, jackhammers, hoe rams, mounted impact hammers, and impact pile drivers (but not vibratory pile drivers).
- B. The intent of this Section is to minimize construction noise within construction areas, lay-down areas, and communities adjacent to the construction site. To this end, the Contractor and all subcontractors, suppliers, and vendors, are required to comply with all applicable noise regulations, specification requirements, and the noise level limits specified herein.
 - C. The Contractor shall use equipment with efficient noise-suppression devices and employ other noise abatement measures such as enclosures and barriers necessary for the protection of the public, as necessary.
 - D. The Contractor shall schedule and conduct operations in a manner that will minimize, to the greatest extent feasible, the disturbance to the public in areas adjacent to the Work and to occupants of buildings in the vicinity of the Work.
 - E. Not Used
 - F. Not Used

- G. Noise Control Measures: Contractor shall implement the following noise-control measures to reduce and control noise generated from construction, demolition, and construction related activities:
1. Restrict noise-producing construction activities Monday through Friday between the hours of 7:00am to 3:30pm, or until 5:30pm with District approval. Saturday from 8:00am to 5:00pm with District approval. Construction on Sundays shall be avoided, if possible, and there will be no construction on public holidays without prior written request submitted to and written approval returned by the District, at its sole discretion. A decision by the District to deny Sunday or holiday work shall not be deemed to cause a delay in the Contract Time. When activities must occur outside the hours specified above, conform with notification requirements of this Section and utilize local barriers around equipment and other noise attenuating devices if necessary to limit noise to acceptable levels.
 2. Comply with all District and County requirements regarding both allowable hours of Work and noise level limitations.
 3. Contractor shall comply with applicable regulatory requirements for the operation of powered construction equipment during all phases of construction.
 4. All construction equipment shall have appropriate mufflers, intake silencers, and other required noise-control features, shall be properly maintained and in compliance with State standards.
 5. Vehicles and other gas or diesel powered equipment shall be prohibited from unnecessary warming up, idling, and engine revving.
 6. Impact tools shall utilize “quiet technology” to minimize noise.
 7. Contractor shall provide and post signs at the Site giving the name and telephone number or e-mail address of the designated College Representative whom the public should contact regarding any noise complaints. If necessary due to complaints, Contractor shall provide additional noise-attenuating measures such as additional mufflers or engine shrouding.
- H. Secure written permission from the District at least three (3) working days prior to using noisy and vibratory equipment, such as jackhammers, concrete saws, impact tools, and high frequency electrical equipment. Cooperate with the District if the use of noisy equipment becomes objectionable to college employees and/or students.
- I. The work must be conducted so that nearby residents will not be disturbed at any time during the Work including, but not limited to, the following requirements:
1. The Contractor shall perform all work within the permissible noise levels, day of week, or weekend and hour of day limitations, and within the guidelines established by applicable federal, state, local, and municipal codes, regulations, laws, and standards.
 2. During the Work, the Contractor shall ensure that all noise generated from construction-related equipment and construction activity complies with applicable Humboldt County and City of Eureka noise standards and thresholds where technically feasible. Noise standards and thresholds of Humboldt County and City of Eureka are therefore included, by reference, in the Contractor’s contract.
 3. In the event of complaints from nearby residents or the campus community, the Contractor shall measure noise levels at adjacent residential lot lines. In the event that construction noise exceeds the specified limits, the responsible construction activity shall

cease until appropriate noise control measures are implemented. In the event that the measured noise level exceeds allowable limits as specified in this Section, or is resulting in nuisance conditions, the Contractor shall immediately alter operations or use noise reduction materials and methods to reduce noise levels or to alleviate the nuisance conditions.

4. Do not use loud vocal or mechanical signals. Use of outside speakers, loud radios and similar devices are prohibited.
5. Not Used.
6. Work shall be performed in a manner to prevent nuisance conditions such as noise which exhibits a specific audible frequency or tone (e.g., backup alarms, poorly maintained equipment, brake squeal, etc.) or impact noise (e.g., jackhammers, hoe rams). The District will make any final interpretation concerning whether or not nuisance noise conditions exist. Only the District representatives and specifically designated College representatives have the authority to stop the Work until nuisance noise conditions are resolved, without additional Contract Time or compensation for the Contractor.

1.5 DUST CONTROL PLAN

- A. Contractor shall develop and submit, in accordance with Section 01 33 00, a Dust Control Plan, and implement dust control measures to protect air quality during construction to control dust emissions generated during construction, implement the following Bay Area Air Quality Management District (BAAQMD) measures for construction emissions of particulate matter over 10 microns in size (PM10):
 1. Water all active construction areas at least twice daily.
 2. Cover all trucks hauling soil, sand and other loose materials, or require all trucks to maintain at least 2 feet of freeboard.
 3. Apply water three times daily or apply (nontoxic) soil stabilizers on all unpaved access roads, parking areas and staging areas at the Site.
 4. Sweep driveways and adjacent public streets daily (with water sweepers) if visible soil materials have been carried onto adjacent public streets.
 5. Suspend excavation and grading activity when winds (instantaneous gusts) exceed 25 miles per hour.
 6. Limit speed of vehicles to 10 miles per hour or less on the Site.
 7. If Campus or neighborhood complaints regarding objectionable dust are received by the College, the Contractor shall take immediately action to abate such conditions.

1.6 TRAFFIC CONTROL PLAN

- A. Contractor shall develop and submit a Traffic Control Plan, and implement the traffic control plan to minimize the effects of construction traffic on the Campus and surrounding residential areas, as appropriate. Submit the plan in accordance with Section 01 33 00 to the District for review and approval.
- B. The Construction traffic control plan will include, at a minimum, the following requirements:
 1. Provide clearly marked pedestrian detours if any sidewalk or pedestrian walkway closures are necessary. Provide clear directional signage as required.

2. Provide clearly marked bicycle detours if bicycle routes must be closed, or if bicyclist safety would be otherwise compromised. Provide clear signage as required.
 3. Provide crossing guards and/or flag persons as needed to avoid traffic conflicts and ensure both pedestrian and bicyclist safety at all times.
 4. Use nonskid traffic plates over open trenches to minimize hazard.
 5. Locate all stationary equipment as far away as possible from areas used heavily by vehicles, bicyclists and pedestrians.
 6. Notify and consult with emergency service providers, including the Campus Police Department, and maintain clear, unobstructed access by whatever means necessary to expedite and facilitate the passage of emergency vehicles.
 7. Obtain Humboldt County approval for preferred construction traffic routing over public streets, location of temporary curb cuts, if any, and/or other construction traffic access and egress from public streets to the Site. Consult with District concerning preferred construction traffic routing prior to requesting County approval. Contractor shall be responsible for obtaining any required permits and for all associated costs.
 8. Avoid routing construction traffic through residential areas to the extent feasible. Prohibit mobilization and demobilization of heavy construction equipment during AM and PM peak traffic hours, and pursuant to Humboldt County requirements.
 9. Provide access for drive ways and private roads outside the immediate construction zone by using steel plates or temporary backfill as necessary.
 10. Prohibit construction worker parking in student parking lots and in residential areas.
- C. Contractor shall notify the District, Project Inspector, Campus Police Department, city and county agencies, as applicable, a minimum of five (5) working days in advance of performing work which necessitates closing or interfering with traffic on public thoroughfares, parking areas, driveways and walks. Obtain written permission prior to effecting such closures and interruptions.
- D. The District will designate an entrance to the Site for the Contractor's use for the Work.

1.7 SPILL PREVENTION, CONTROL AND COUNTERMEASURE PROGRAM

- A. Contractor shall prepare and implement a Spill Prevention, Control and Countermeasure Program (SPCCP) to minimize the potential for and effects from spills of hazardous, toxic or petroleum substances during construction and demolition activities. Submit a SPCCP Plan to the District in accordance with Section 01 33 00 and obtain approval of the SPCCP before any construction or demolition activities begin at the Site.
- B. Contractor shall routinely inspect the construction area to verify that the measures specified in the SPCCP are properly implemented and maintained. Inform the District immediately if there is a noncompliance issue and take immediate measures to restore compliance.
- C. The federal reportable spill quantity for petroleum products, as defined in 40 CFR 110, is any oil spill that includes any of the following:
 1. Violates applicable water quality standards.
 2. Causes a film or sheen on or discoloration of the water surface or adjoining shoreline.
 3. Causes a sludge or emulsion to be deposited beneath the surface of the water or adjoining shorelines.

- D. If a spill is reportable, notify the District's Representative and take action to contact appropriate safety and clean-up crews to ensure that the SPCCP is followed.
1. A written description of reportable releases must be submitted to the District's Representative and to the North Coast Regional Water Quality Control Board (RWQCB). This submittal must contain a description of the spill, including the type of material and an estimate of the amount spilled, the date of the release, an explanation of why the spill occurred and a description of the steps taken to prevent and control future releases. Document the releases on a spill report form.
 2. If a reportable spill has occurred and results determine that project activities have adversely affected surface water or groundwater quality, the District will engage a registered environmental assessor at Contractor's expense for a detailed analysis to identify the likely cause of contamination. This analysis will conform to American Society for Testing and Materials (ASTM) standards and will include recommendations for reducing or eliminating the source or mechanisms of contamination.
 3. Based on this analysis, the Contractor shall select and implement measures to control contamination, with a performance standard that groundwater quality must be returned to baseline conditions. These measures will be subject to approval by the District.

1.8 TREE PROTECTION PLAN

- A. Develop and submit a Tree Protection Plan to the District in accordance with Section 01 33 00 and obtain approval prior to Start or Work on site. The plan shall include full-size drawings of the Site and indicate all trees that may be impacted by the Work, and all trees that will require proactive protection from damage. Protective measures must be indicated in the plan and on the Drawings.
- B. Definitions:
1. Dripline: The area on the ground from the trunk of any tree to the point directly below the outermost tips of the foliage of that tree.
 2. Root Protection Zone ("RPZ"): The areas enclosed with tree protection fencing as designated on the Drawing(s).
 3. Tree damage: Tree damage shall include, but not limited to, the following: Significant injury to the root system or other parts of a tree including burning, application of toxic substances, damaging through contact with equipment or machinery, changing the natural grade within the Dripline or RPZ, compacting the soil within the Dripline or RPZ, interfering with the normal water requirements of the tree, unauthorized trenching or excavating within the Dripline or RPZ, or unauthorized removal of more than 1/3 of the live wood, foliage or roots.
- C. Root Protection: No storage of materials or equipment will be allowed within the Dripline. Whenever possible, excavation shall be on a radial line, diverging from the tree trunk. For items of Work delayed materially beyond the date of Substantial Completion, provide update submittal within 14 Days after acceptance, listing date of acceptance as start of warranty period.
- D. Exposure to harmful substances: No storage or dumping of any substances that may be harmful to trees shall occur at any location on the Site.
- E. Where construction is to be performed in the vicinity of trees and shrubbery, the Work shall be carried on in a manner that will cause minimum damage. District will designate trees that are to

be removed. Under no circumstances are additional trees to be removed without written permission from District. Trees and shrubbery that are not to be removed shall be protected from injury or damage resulting from Contractor’s operations.

- F. Any tree that is removed without District’s permission or is irreparably damaged, in the opinion of District, shall cost Contractor in damages [\$100.00] per square inch of cross section, measured at 4 ½ feet above ground, but not less than [\$250.00], such cost to be deducted from monies due or to become due under the Contract. If tree protection is not performed or is not performed adequately and District determines that a tree has been irreparably damaged, Contractor shall pay the same amount of damages as for unauthorized removal of a tree. Contractor shall immediately report all tree damage to District, so that District may determine applicable damages.

1.9 MIGRATORY BIRD PROTECTION

- A. Conduct tree removal and building demolition outside of the migratory bird nesting season. The bird nesting season for migratory birds in this part of California is **February 1 through August 31.**
- B. If tree removal or building demolition must take place during the bird nesting season, these activities shall be preceded by a survey paid for by the District for nesting migratory birds by a certified Wildlife Biologist in the State of California. If bird nests are discovered in the trees or on the buildings, they shall not be removed while the nest(s) are active. Contractor shall plan and schedule to remove all trees and buildings during the non-bird nesting season, which is between September 2nd and February 14th each year to avoid the need for such activities during the bird nesting season. Any delays as result of tree or building removal that could not occur during the bird nesting season due to active nests are the responsibility of the Contractor if said delays were within the control of the Contractor by performing the work in the non-bird nesting season.

1.10 CULTURAL RESOURCES PROTECTION PLAN

- A. Develop and submit a Cultural Resources Protection Plan in accordance with Section 01 33 00. If buried cultural resources, such as chipped or ground stone, historic debris, building foundations or human bones or paleontological resources are discovered inadvertently during ground-disturbing activities, Contractor shall avoid any further disturbance of the materials and immediately discontinue earthwork within 100 feet of the find. Contractor shall notify District’s Representative immediately upon encountering cultural resources. Contractor shall be prepared to move on to another location or phase of work, allowing sufficient time for District’s Representative to evaluate the nature and significance of the find and implement appropriate management procedures.
- B. In the event that prehistoric human remains are encountered, further excavation or disturbance of the site shall cease immediately, pursuant to Health and Safety Code 7050.5. Contractor shall notify District’s Representative immediately upon encountering human remains. Contractor shall move on to another location or phase of Work to allow proper assessment of the situation.
- C. If human remains of Native American origin are discovered during construction, it will be necessary to comply with State laws relating to the disposition of Native American burials, which fall under the jurisdiction of the Native American Heritage Commission (NAHC) (Public Resources Code (PRC) Section 5097. Consequently, if any human remains are discovered or recognized in any location other than a dedicated cemetery, there will be no further excavation or disturbance of the site or any nearby areas reasonably suspected to overlie adjacent human remains:

1. Until the Humboldt County Coroner has been informed and has determined that no investigation of the cause of death is required;
2. If the remains are of Native American origin;
 - a. Until the District consults local Tribes and/or descendants of the deceased Native American(s) for a recommendation to the landowner or the person responsible for the excavation work regarding means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods as provided in PRC Section 5097.98 or
 - b. If the NAHC has been unable to identify a descendent or the descendent failed to make a recommendation within 24 hours after being notified by the NAHC, comply with State laws relating to the disposition of Native American burials, as stated above.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

Not Used.

END OF SECTION 01 35 00

SECTION 01 35 20
SITE SECURITY AND SAFETY

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. All Contract Documents shall be reviewed for applicable provisions related to the provisions in this document, and provisions in the General Conditions and other Division 1 Specification Sections shall apply to this Section without limitation.

1.2 RELATED REQUIREMENTS SPECIFIED IN OTHER SECTIONS

- A. Section 01 11 00 – “Summary of Work”
- B. Section 01 31 00 – “Project Management and Coordination”
- C. Section 01 31 19 – “Project Meetings”
- D. Section 01 41 00 – “Regulatory Requirements”
- E. Section 01 66 13 – “Product Storage and Handling Requirements for Hazardous Materials”
- F. Section 01 35 00 – “Special Procedures”
- G. Section 01 50 00 – “Temporary Facilities and Control”
- H. Section 01 77 00 – “Contract Closeout Procedures”
- I. Section 01 78 39 – “Project Record Documents”
- J. Divisions 2 through 41 Sections for Site Security and Safety requirements for the work in those Sections.

1.3 SUMMARY

- A. This Section specifies the requirements for Site safety and security.

1.4 CONTRACTOR RESPONSIBILITIES

- A. The Contractor is constructive owner of Project site.
- B. The Contractor shall be responsible for all damages to persons or property that occur as a result of its fault or negligence in connection with the prosecution of this Contract and shall take all necessary measures and be responsible for the proper care and protection of all materials delivered and work performed until Final Completion by the District.
- C. All work shall be solely at the Contractor’s risk, with the exception of damage to the work caused by “acts of God” as defined in Public Contract Code Section 7105(b)(2).
- D. The Contractor shall be solely responsible for initiating, maintaining and supervising all safety programs required by applicable law, ordinance, regulation or governmental orders in connection with the performance of the Contract, or otherwise required by the type or nature of the Work.
- E. Without limiting or relieving the Contractor of its obligations hereunder, the Contractor shall require that its Subcontractors similarly initiate and maintain all appropriate or required

safety programs. Prior to commencement of Work at the Site, the Contractor shall provide the District with the Contractor's proposed site-specific safety plan for the Work for the District's review.

- F. Contractor shall take, and require all subcontractors to take, all necessary precautions for safety of workers on the Work and shall comply with all applicable federal, state, local and other safety laws, standards, orders, rules, regulations, and building codes to prevent accidents or injury to persons on, about, or adjacent to premises where Work is being performed and to provide a safe and healthful place of employment.
- G. In addition to meeting all requirements of OSHA, Cal-OSHA, state, and local codes, Contractor shall furnish, erect and properly maintain at all times, as directed by District or required by conditions and progress of work, all necessary safety devices, safeguards, construction canopies, signs, audible devices for protection of the blind, safety rails, belts and nets, barriers, lights, and watchmen for protection of workers and the public, and shall post danger signs warning against hazards created by such features in the course of construction.
- H. The Contractor and Subcontractors shall continuously protect the Work, the District's property, and the property of others, from damage, injury, or loss arising in connection with operations under the Contract Documents. The Contractor and Subcontractors, at their own expense, shall make good any such damage, injury, or loss, except such as may be solely due to, or caused by, agents or employees of the District. The Contractor shall immediately repair or replace all property damaged or lost due to Contractor's, or Subcontractor's, failure to protect the Work or otherwise caused by Contractor or Subcontractor operations. A determination as to cause of damage or insurance or risk coverage at any level shall not delay repair or replacement. Contractor shall not rely on District insurance or risk coverage. If Contractor or Subcontractor disagrees with the District's determination of cause, a claim may be filed in accordance with these Contract Documents.
- I. Contractor shall maintain protection as necessary to protect the Work, as a whole and in part, and adjacent property and improvements from accidents, injuries or damage.
- J. Contractor shall protect the Work, material, and/or equipment to be incorporated therein, whether in storage on or off the Site, and under the care, custody, or control of the Contractor or the Contractor's Subcontractors.
- K. Contractor shall correct any violations of safety laws, rules, orders, standards, or regulations. Upon the issuance of a citation or notice of violation by the Division of Occupational Safety and Health, such violation shall be corrected promptly.
- L. Contractor shall require that Subcontractors participate in, and enforce, the safety and loss prevention programs established by the Contractor for the Project, which will cover all Work performed by the Contractor and its Subcontractors.
 - 1. Subcontractors shall enforce the District's and the Contractor's instructions, laws, and regulations regarding signs, advertisements, fires, smoking, the presence of liquor, and the presence of firearms by any person at the Site.
 - 2. Each Subcontractor shall designate a responsible member of its organization whose duties shall include loss and accident prevention, and who shall have the responsibility and full authority to enforce the program. This person shall attend

meetings with the representatives of the various Subcontractors employed to ensure that all employees understand and comply with the programs.

3. All Subcontractors and material or equipment suppliers shall cooperate fully with Contractor, the District, and all insurance carriers and loss prevention engineers.
4. Subcontractors shall immediately report in writing to the Contractor all accidents whatsoever arising out of, or in connection with, the performance of the Work, whether on or off the Site, which caused death, personal injury, or property damage, giving full details and statements of witnesses.

1.5 CONFORMANCE WITHIN ESTABLISHED LIMITS

- A. The Contractor and Subcontractors shall confine their construction equipment, the storage of materials, and the operations of workers to the limits indicated by laws, ordinances, permits, and the limits established by the District, or the Contractor in the case of Subcontractors, and shall not unreasonably encumber the premises with construction equipment or materials.

1.6 CONTRACTOR NOTICES

- A. The Contractor shall give notices and comply with applicable laws, ordinances, rules, regulations, and lawful orders of public authorities bearing on the safety of persons or property or their protection from damage, injury, or loss.

1.7 SITE SAFETY OFFICER

- A. Contractor shall designate a responsible member of its organization on the Work, whose duty shall be to enforce the Contractor’s Safety program Plan, post information regarding protection and obligations of workers and other notices required under occupational safety and health laws, to comply with reporting and other occupational safety requirements, and to protect the life, safety and health of workers. The name and position of person so designated shall be reported to District in writing by Contractor within ten (10) days of award of the Contract.
- B. District’s representative(s) shall be allowed access to accident/injury and illness reports, inspection reports, scheduling and construction meetings, and safety meetings.

1.8 SAFETY PROGRAM PLAN

- A. Prior to commencing Work at the Site, Contractor shall submit a Safety Program Plan specifically tailored for this Project and this Site that has been reviewed and approved by an Industrial Hygienist certified by the American Board of Industrial Hygiene or a Certified Safety Professional. The Safety Program Plan shall include the name, certification number, and certification seal of the Industrial Hygienist or Certified Safety Professional. Comply with the Safety Program and all applicable federal, state, and local regulation codes, rules, law and ordinances during the course of the Work.
- B. The Contractor’s Safety Program Plan shall include all actions and programs necessary for compliance with California or federally statutorily mandated workplace safety programs, including without limitation, compliance with the California Drug Free Workplace Act of 1990 (California Government Code SS 8350 et seq.)

- C. Plan shall comply with the requirements of the Occupational Safety and Health Act, and other applicable federal, state and local standards.
- D. Contractor shall keep copies of all health and safety-related plans on the Site at all times.
- E. Receipt and/or review of the Safety Program Plan by District shall not relieve Contractor of any responsibility for complying with all applicable safety regulations.
- F. It is essential that Contractor and each Subcontractor implement an effective and vigorous site specific Safety Program for the Work.
- G. The Contractor shall have sole responsibility for Project safety, and shall be solely responsible for providing a safe workplace
- H. Safety Program Plan Components:
 - 1. Injury and Illness Prevention Program (IIPP): Conforming to the General Industrial Safety Orders (CCR Title 8, Division 1, Chapter 4, Subchapter 7, Section 3203), and the California Labor Code (Section 6401.7).
 - 2. Site-Specific Safety and Health Plan (SSHP): This Plan shall describe the health and safety procedures that shall be implemented during the Work in order to ensure safety of the public and those performing the Work. Follow the guidelines for a SSHP listed in CCR Title 8, Division 1, Chapter 4, Subchapter 7, Section 5192, Item (b)(4)f.
 - 3. Permit-Required Confined Space Program: (CCR Title 8, Division 1, Chapter 4, Subchapter 7, Section 5157). Permit-required space entry is allowed only through compliance with a permit-required confined space program meeting the requirements of Section 5157 of the General Industrial Safety Orders. During entry operations, or at the conclusion of entry operations, verbally notify Engineer of the permit space program followed, and of any hazards confronted or created in permit-required spaces during entry operations.
 - 4. A written and certified workplace hazard assessment as required by OSHA and Cal OSHA, updated on a regular basis, and maintained on site. The certified hazard assessment shall be made available immediately upon request by the District, the Architect, or the Inspector of Record.
- I. Supply sufficient hard hats to properly equip all employees, workers, and visitors. Hard hats shall be mandatory as per CAL OSHA Construction Safety orders.
- J. Whenever an exposure exists, appropriate personal protective equipment (PPE) shall be used by all affected personnel. Contractor shall provide PPE to all personnel under Contractor's direction and responsibilities.
- K. After review by District, the implementation and enforcement of all Safety-related plans shall become the responsibility of the Contractor and Site Safety Officer. The Contractor shall notify the District in writing of any changes to Safety-related plans.

1.9 SAFETY PRECAUTIONS

- A. The Contractor shall be solely responsible for initiating and maintaining reasonable precautions for safety of, and shall provide reasonable protection to prevent damage injury or loss to:
 - 1. Employees on the Work and other persons who may be affected thereby

2. The Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody or control of the Contractor or the Contractor's Subcontractors or Sub-subcontractors
 3. Other property or items at the site of the Work, or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction. The Contractor shall take adequate precautions and measures to protect existing roads, sidewalks, curbs, pavement, utilities, adjoining property and improvements thereon (including without limitation, protection from settlement or loss of lateral support), and to avoid damage thereto. Without adjustment of the Contract Price or the Contract Time, the Contractor shall repair, replace or restore any damage or destruction of the foregoing items as a result of performance or installation of the Work.
 4. The Contractor shall at all times maintain good housekeeping practices to reduce the risk of fire damage.
 5. Good housekeeping practices shall be maintained continually on all areas of the Site and the Work. District may request that the Contractor hire additional staff or help until housekeeping in a work or storage area is improved. All scrap materials, rubbish and trash shall be removed daily from in and about the building and shall not be permitted to be scattered on adjacent property.
- B. COVID-19 Requirements: Service provider and any subcontractors, agents, or employees, shall fully comply with all provisions and requirements as they relate to protection against infectious diseases, including COVID-19. Contractor and any subcontractors, agents or employees shall review and comply with the most recent directives from the California Department of Public Health, Humboldt County Health Services, and the College of the Redwoods' policies and protocols as they relate to COVID-19 exposure and safe practices. In the event of discrepancies, the most current College of the Redwoods' policies and protocols shall apply (see Available Information).
- C. Suitable storage space shall be provided outside immediate building areas for storing flammable materials and paints. Excess flammable liquids being used inside the building shall be kept in closed metal containers and be removed from the building during unused periods.
- D. A fire extinguisher shall be available at each location where cutting or welding is being performed. Where electric or gas welding or cutting work is done, interposed shields of incombustible material shall be used to protect against fire damage due to sparks and hot metal. When temporary heating devices are used, a watchman shall be present to cover periods when other workmen are not on the premises.
- E. The Contractor shall provide fire extinguishers in accordance with all OSHA and Cal OSHA requirements, and the recommendations NFPA Bulletins Nos. 10 and 241.

1.10 REQUIREMENTS FOR EXISTING SITES

- A. Deliver materials to building area over route(s) approved by the District.
- B. Take preventive measures to eliminate objectionable dust, noise, or other disturbances.
- C. Confine apparatus, the storage of materials, and the operations of workers to limits indicated by law, ordinances, permits or directions of Architect; and not interfere with the Work or

unreasonably encumber premises or overload any structure with materials; and enforce all instructions of District and Architect regarding signs, advertising, fires, and smoking and require that all workers comply with all regulations while on the Site.

- D. Take care to prevent disturbing or covering any survey markers, monuments, or other devices marking property boundaries or corners. If such markers are disturbed by accident, they shall be replaced by a licensed land surveyor or civil engineer, and all lawfully required maps and records shall be filed with county and local authorities at no cost to the District. All related filing and plan check fees shall be paid by Contractor.
- E. Contractor shall take adequate precautions to protect existing roads, sidewalks, curbs, pavements, utilities, adjoining property and structures (including, without limitation, protection from settlement or loss of lateral support), and to avoid damage thereto, and repair any damage thereto caused by construction operations. All permits, licenses, or inspection fees required for such repair Work shall be obtained and paid for by Contractor.
- F. The Contractor, at Contractor's expense, will remove all mud, water, or other elements as may be required for the proper protection of existing improvements, and prosecution of the Work.
- G. Protect all other property at the Site or adjacent thereto as required, such as trees, shrubs, lawns, walks, pavement, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction.

1.11 SAFETY AND EMERGENCY CONDITIONS

- A. **Emergency Action:** In an emergency affecting the safety of persons or property, the Contractor shall take any action necessary, at the Contractor's discretion, to prevent threatened damage, injury, or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided herein. Emergency conditions shall be any condition at the Site which has the actual or potential for significant adverse effects to persons or property, whether or not resulting from the Contractor's operations.
- B. **Accident Reports:** The Contractor shall promptly report in writing to the District all accidents arising out of or in connection with the Work, which caused death, personal injury, or property damage, giving full details and statements of any witnesses. In addition, if death, serious personal injuries, or serious property damages are caused, the accident shall be reported immediately by telephone or messenger to the District and Campus Police Department.
- C. The District's Representatives and Project Inspector, as appropriate, shall be notified of the existence of such a condition, but shall not be called upon to perform any emergency service. The fact that the District may not respond to the emergency condition shall not be used as an excuse by the Contractor to neglect immediate action; nor will the District or its Representatives be liable for any resulting condition. The fact that a representative of the Contractor may not be present when emergency conditions occur shall not relieve the Contractor from an immediate response to the situation which shall return the disruption to normalcy.
- D. If the emergency circumstances are not the result of any fault or neglect of the Contractor, the Contract time shall be adjusted to reflect the actual direct effect of such actions to the

then critical path of the Construction Progress Schedule. The foregoing notwithstanding, adjustments of the Contract Price or the Contract Time for actions taken by the Contractor in response to emergency circumstances shall be subject to the Contractor's strict compliance with all other applicable provisions of the Contract Documents relating to notices and time for delivery of notices.

1.12 SAFETY SIGNS AND BARRICADES

- A. The Contractor shall erect and maintain, as required by existing conditions and conditions resulting from performance of the Contract, reasonable safeguards for safety and protection of property and persons, including, without limitation, posting danger signs and other warnings against hazards, promulgating safety regulations and notifying Districts and users of adjacent sites and utilities.
- B. Contractor shall properly protect the Work:
 - 1. With lights, guard rails, fencing, temporary covers and barricades.
 - 2. Enclose excavations with proper barricades.
 - 3. Brace and secure all parts of the Work against to protect against inclement weather and to prevent accidents.
- C. Provide such additional forms of protection that may be necessary under during the course of the Work.
- D. Contractor shall provide and maintain in good condition all protective measures required to adequately protect the public from hazards resulting from the Work. When regulated by Building Code, Cal OSHA, or other authority, such legal requirements for protection shall be considered as minimum requirements. Contractor shall be responsible for the protection in excess of such minimum requirements as required.
- E. Contractor shall prevent unauthorized persons from the entering the Work Site(s).

1.13 CONTROL OF SITE

- A. Contractor shall ensure that no alcohol, firearms, weapons, or controlled substances are present on the Project Site. Contractor shall immediately remove from the Site and terminate from this Project the employment of any employee found in violation of this provision.

1.14 SITE SECURITY

- A. Contractor shall take and be fully responsible for all reasonably required measures to protect and maintain the security of persons, existing facilities, and property at the Site, including prevention of theft, loss, and/or vandalism by persons lawfully present on the Site, including non-working times. Contractor's measures shall include, at a minimum, maintaining a log of all persons entering and leaving the Site, who they represent, what they are delivering, and to whom.
- B. No claim shall be made against District by reason of any act of an employee or trespasser, and Contractor shall repair all damage to District's property resulting from Contractor's failure to provide adequate security measures.
- C. But for immediate access to and from the Contractor controlled Site and staging area(s), the access gates shall remain closed and locked at all times. Contractor shall appoint one person

to monitor access through the gate and maintain the sign-in/out list. Alternatively, Contractor may provide a full-time security guard at the gate to control access and maintain the sign-in/out list. The sign in/out list shall be available to District at any time, upon request. If District determines that the gate has been left unlocked, Contractor shall, if requested by District, provide a full time guard at no additional expense to the District.

- D. The Contractor and the Subcontractors shall use only those ingress and egress routes designated by the District, observe the boundaries of the Site designated by the District, park only in those areas designated by the District, which areas may be on or off the Site, and comply with any parking control program established by the District, such as furnishing license plate information and placing identifying stickers on vehicles.
- E. Contractor shall supply all security fencing, barricades, lighting, and other security measures as required to protect and control the Site.
- F. The Contractor shall be responsible for providing security services for the Site as needed for the protection of the Site and as determined in the District’s sole discretion.

1.15 OPERATORS OF MOBILE EQUIPMENT SAFETY

- A. Under Federal and State Safety requirements, Contractor must certify that all operators of mobile equipment including but not limited to forklifts, cranes, man-lifts, scissor and boom lifts, and similar equipment are required to have been trained and/or certified on the proper operation of such equipment. Copies of equipment training and certification records shall be forwarded, upon request, to the District.

1.16 SAFETY REQUIREMENTS

- A. Contractor shall meet and comply with requirements of current local, State and Federal regulations.
- B. Contractor shall meet and comply with the following rules:
 - 1. The Contractor will provide and maintain at the Site first-aid supplies that comply with the current Occupational Safety and Health Regulations.
 - 2. Hard hats shall be worn at all times. (This includes welders when using welding hoods)
 - 3. Sleeved shirts shall be worn at all times. (No tank tops)
 - 4. If required, Fire Retardant Clothing (FRC) shall be supplied by Contractor for all their employees.
 - 5. One Hundred Percent (100%) Fall Protection Policy: All subcontract employees shall comply with Fall Protection Policy. The Policy simply states “Anytime employees are working from an unprotected elevation of six (6) feet or more, fall protection must be used.” Working, as stated above, means while traveling, stationary, or anytime exposed to a fall from a surface not protected by approved handrails, cable or some other approved fall elimination device. Adherence to this policy is a requirement of your Subcontract.
- C. Hazards Control:
 - 1. When use or storage of any hazardous materials or equipment, or unusual method is necessary for execution of the Work, the Contractor shall exercise utmost care and

carry on such activities under supervision of properly qualified personnel. The Contractor shall notify the District any time that explosives or hazardous materials are expected to be stored on Site. Location of storage shall be coordinated with the District and local fire authorities.

2. Store volatile wastes in covered metal containers and remove from premises daily.
 3. Prevent accumulation of wastes that create hazardous conditions.
 4. Provide adequate ventilation during use of volatile or noxious substances.
- D. Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.
1. Do not burn or bury rubbish or waste material on the Site.
 2. Do not dispose of volatile wastes such as mineral spirits, oil, or paint thinner in storm or sanitary drains.
 3. Do not dispose of wastes into streams or waterways.
- E. Provide accident information on the forms provided by Contractor. This information shall be provided on the same day as the occurrence of said incident and shall be submitted to District within a reasonable time.

1.17 ADDITIONAL SAFETY CONTROLS

- A. According to industry practices, it is the responsibility of the Contractor and subcontractors of every tier to exercise reasonable care to prevent work-related injuries and property and equipment damage at the Site, as well as minimize risk to the public and third-party property. The Contractor, all sub-contractors, suppliers, and installers shall undertake loss control prevention practices according to the requirements set forth by federal, state and city laws, statutes, and the specific procedures developed for this Project.
- B. Contractors and subcontractors participating in the project will be expected to comply with the following safety and loss control requirements:
1. All sub-contractors, suppliers, and installers shall identify their contact person(s) to the Contractor.
 2. Follow District procedures regarding dealing with the media, including, but not limited to, TV, Radio, and Newspaper.
 3. All construction employees will be required to be attired in workpants, shirt and appropriate boots or closed toe shoes.
 4. Smoking is prohibited on the Site.
 5. Controlling access to the construction site is a very high priority, and Contractors will be required to take whatever preventative measure, such as barriers, fencing, etc., as outlined in the Contract Documents.
 6. Construction personnel cannot enter District property other than the construction site unless accompanied by District personnel, and they are allowed only 'incidental' contact with students. Violations of these requirements by any construction employee will result in a mandatory background check of that employee – including fingerprinting – as required by state law.

7. Fall protection is mandatory on all projects in accordance with CAL OSHA, OSHA and any other Local, State, and Federal appropriate code and requirements.
 8. Personal radios, headsets, walkmans and CD players are not allowed on the Site.
 9. All Contractors must attend the pre-construction safety meeting.
 10. No sexual reference or preference shall be permitted on any piece of clothing or the hardhat. Any employee observed disregarding this policy shall be removed from the Site until further notice from the District.
 11. Contractor personnel and subcontractor personnel at all levels will refrain from interacting with Campus staff or students unless required to prevent an unsafe situation. Personnel found speaking to staff or students for any reason unrelated to the Work or Safety shall be removed from the Site and not be allowed to return.
 12. All Contractors' employees shall park in their designated parking area. Any sticker attached to the employees' vehicle that displays any form of sexual preference or reference shall be removed prior to parking at the Site. Each employee will provide their license plate number to the Contractor. Any employee disregarding this policy shall be removed from the Site until further notice from the District.
 13. The Contractor shall control the break time activities of the employees to assure the cleanup of all soda cans, food wrappers, plastic bottles, or food containers from the break area. Such areas shall be cleaned immediately after the break and all waste placed in trash receptacles.
 14. Theft or willful damage to any property of the District, student, or other Campus or District personnel will be prosecuted fully by the District.
 15. No guns, switchblades, or knives with blades greater than two inches shall be allowed on the Site. Any employee disregarding this policy shall be removed from the Site until further notice from the District.
- C. The Contractors and all subcontractors, suppliers and installers participating in the Project will further be expected to comply with the following safety and loss control requirements:
1. All Contractor, subcontractors, supplier, and installer personnel shall comply with all District, local, state, and federal emergency responder directions in the event of an emergency or disaster.
 2. Any Contractors' employee observed providing or selling cigarettes or other smoking materials to students shall be removed from the Site until further notice from the District.
 3. All Contractors will agree to conduct and fund post-injury drug screening of their employees. Those employees failing the test will be removed permanently from the Site.
 4. The District has the right to instruct the Contractor to correct an unsafe act or condition. If the Contractor fails to correct the unsafe act or condition within the requested time frame, the District or its representative may have the condition corrected and bill the non-compliant contractor, supplier, subcontractor, or installer for the costs associated with the correction.

5. The District may require a follow-up meeting or contact if there is a death, serious and willful claim, serious disabling injury, adverse loss experience, major fire, or serious third party claim.
 6. Any contractor displaying, in the opinion of the Contractor or District, a repeated disregard for safety can be removed from the Site.
- D. All Contractors will advise those non-English speaking employees in their native language either in a written format or via an interpreter of these policies.

1.18 HAZARD COMMUNICATION PROGRAM SAFETY

- A. Contractor shall have a copy of the Contractor’s Hazard Communication Program which shall be forwarded to the District and a copy is required to be in the possession of the Contractor on the Site. Documentation of employee Hazard Communication Training must be established by the Contractor prior to commencement of work.
- B. Any potential hazardous material or chemical brought onto the project is required to be accompanied by a Material Safety Data Sheet (MSDS). Copies of the MSDS shall be forwarded to the District, and Project Inspector before the product is brought onto the Site.
- C. Contractor is required to have material safety data sheets available in a readily accessible place at the Site for any material requiring a material safety data sheet per the Federal “hazard communication” standard, or employees’ “right-to-know law.” The Contractor is also required to properly label any substance brought into the Site, and require that any person working with the material, or within the general area of the material, is informed of the hazards of the substance and follows proper handling and protection procedures.
- D. Contractor is required to comply with the provisions of California Health and Safety Code section 25249, et seq., which requires the posting and giving of notice to persons who may be exposed to any chemical known to the State of California to cause cancer. The Contractor agrees to familiarize itself with the provisions of this section, and to comply fully with its requirements.
- E. Contractor shall notify the District and Project Inspector before any chemical/material creating noxious or toxic fumes is used.

1.19 SHORING AND STRUCTURAL LOADING

- A. The Contractor shall not impose structural loading upon any part of the Work under construction or upon existing construction on or adjacent to the Site in excess of safe limits, or loading such as to result in damage to the structural, architectural, mechanical, electrical, or other components of the Work.
- B. The design of all temporary construction equipment and appliances used in construction of the Work and not a permanent part thereof, including, without limitation, hoisting equipment, cribbing, shoring, and temporary bracing of structural steel, is the sole responsibility of the Contractor. All such items shall conform with the requirements of governing codes and all laws, ordinances, rules, regulations, and orders of all authorities having jurisdiction.
- C. The Contractor shall take special precautions, such as shoring of masonry walls and temporary tie bracing of structural steel work, to prevent possible wind damage during construction of

the Work. The installation of such bracing or shoring shall not damage the Work in place or the Work installed by others. Any damage which does occur shall be promptly repaired by the Contractor at no cost to the District.

- D. The Contractor is required to provide shoring as required to protect existing buildings and other structures. All shoring to protect existing structures shall be designed by a licensed California Structural Engineer and submitted to the District prior to any work occurring in the vicinity of the existing structure(s). Contractor shall also be responsible to place monitoring points by a California Licensed Surveyor prior to the start of work to monitor any possible movement during the course of construction. Prior to, during and after nearby utilities have been installed, the Contractor's California Licensed Surveyor shall survey the pre-established survey points to confirm existing structures did not move during the installation of the nearby utility work.
- E. The Contractor is responsible to provide all temporary shoring for utility trenching activities, and other temporary shoring as required by law to install new improvements. All temporary shoring noted above shall be designed by a California Licensed Civil Engineer, other than the structural shoring required by a Licensed Structural Engineer in Paragraph 1.19D above.

1.20 SAFETY AND ELECTRICAL STANDARDS

- A. The Contractor shall comply with all safety and electrical standards to ensure that all its employees are protected by Ground Fault Circuit interrupters as required, throughout the course of the Contractor's work.
- B. The Contractor is responsible for installation of any and all temporary power service for the project and shall provide it with Ground Fault Interrupter Protection with no additional cost to the District.

1.21 HAZARDOUS SUBSTANCES

- A. No asbestos or asbestos-containing products shall be used in this construction or in any tools, devices, clothing, or equipment used to affect this construction. See Section 01 66 13, Hazardous Materials and other related Contract Documents.
- B. The Contractor shall not receive, use or store at the Site any hazardous substance unless contained in a container labeled with the original label applied by the Manufacturer of such substance. The Contractor shall maintain at the Site and forward to the District and Project Inspector copies of the most current material safety data sheets with respect to each hazardous substance received, used or stored at the Site by the Contractor.
- C. The Contractor shall immediately forward to the District and Project Inspector any updated material safety data sheets.
- D. The Contractor shall properly label and inform the District and Project Inspector of, any pipes or piping systems containing hazardous substances used or maintained at the Site by the Contractor. Prior to the receipt of such materials at the Site, the Contractor shall submit a list of all materials which the Contractor intends to receive, use or store at the Site that are classified as hazardous substances pursuant to applicable federal, state or local Employee or Community Right to Know statutes, regulations or requirements.

1.22 SAFETY SURVEYS

- A. Inspector of Record may conduct periodic safety surveys of the Project. Any safety discrepancy observed will be reported to the appropriate Contractor Site Safety Representative for immediate correction.
- B. District, Architect, and/or Inspector of Record safety surveys do not, without any limitation, relieve the Contractor of their primary responsibility to self-inspect the Work and equipment, and to conduct the Work in a safe manner.
- C. Contractor shall provide the District, and Project Inspector with Monthly Contractor Accident Statistics Reports.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION 01 35 20

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SECTION 01 41 00

REGULATORY REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. All Contract Documents shall be reviewed for applicable provisions related to the provisions in this document, and provisions in the General Conditions and other Division 1 Specification Sections shall apply to this Section without limitation.

1.2 RELATED REQUIREMENTS SPECIFIED IN OTHER SECTIONS

- A. Divisions 2 through 41 Sections for Regulatory requirements for the work in those sections.

1.3 SUMMARY

- A. This Section includes regulatory requirements applicable to the Contract Documents and the Project and Work.
- B. Specific reference in the Specifications to codes and regulations or requirements of regulatory agencies shall mean the latest printed edition of each adopted by the regulatory agency in effect at the time of the opening of Proposals, except as may be otherwise specifically stated in the Contract Documents.
- C. No change order shall be considered for any change in any applicable federal, state or local code or regulation if similar language existed in an alternate applicable regulation in force at the time of opening of Bids.
- D. Contractor shall not allow design or construction of any conditions wherein the finished Work will not comply with current applicable codes. No change order shall be considered by District for the Work correction of any Work not complying with code.
- E. This section shall cover the general requirements for regulatory requirements pertaining to the Work and is supplementary to all other regulatory requirements mentioned or referenced elsewhere in the Contract Documents.

1.4 REFERENCES TO REGULATORY REQUIREMENTS

- A. Code, laws, ordinances, rules and regulations referred to shall have full force and effect as though printed in full in these Specifications. Code, laws, ordinances, rules and regulations are not furnished to Contractor because Contractor is assumed to be and shall be familiar with these requirements, including readily available access to these requirements. The listing of applicable codes, laws, and regulations for hazardous waste abatement Work in the Contract Documents is supplied to Contractor as a courtesy and shall not limit Contractor’s responsibility for complying with all applicable laws, regulations or ordinances having application to the Work. Where conflict among the requirements or with these Specifications occurs, the most stringent requirements shall be used with no change in Contract Sum or Contract Time.
- B. Contractor shall conform to all applicable federal, state, and local codes, laws, ordinances, rules and regulations, whether or not referenced in the Contract Documents.

- C. Precedence:
 1. Where specified requirements differ from the requirements of applicable codes, ordinances and standards, the more stringent requirements shall take precedence.
 2. Where Contract Documents require or describe products or execution of better quality, higher standard or greater size than required by applicable codes, ordinances and standards, Contract Documents shall take precedence so long as such increase is legal.
 3. Where no requirements are identified on Contract Documents, comply with all requirements of applicable codes, ordinances and standards of governing authorities have jurisdiction.

1.5 REGULATORY REQUIREMENTS

- A. All statutes, ordinances, laws, rules, codes, regulations, standards, and lawful orders of all public authorities have jurisdiction of the Work, are hereby incorporated into these Contract Documents as if repeated in full herein and are intended to be included in any reference to Code or Building Code, unless otherwise specified, including, without limitation, the references in the list below. Contractor shall make available at the Site, copies of all the listed documents applicable to the Work as the District and/or Architect may request, including, without limitation, applicable portions of the California Code of Regulations (“CCR”).
- B. This Project shall be governed by applicable regulations, including, without limitation, the State of California’s Code Section Group 1, Chapter 4, Part 1, Title 24, CCR, and the most current version on the date the bids are opened and as it pertains to school construction including, without limitation:
 1. Test and testing laboratory per Section 4-335 (District shall pay for the testing laboratory.)
 2. All special inspections per Section 4-333(c).
 3. Contractor shall submit verified reports per Section 4-365 & 4-343(c).
 4. Administration
 - a. Duties of the Architect & Engineers shall be per Section 4-333(a) & 4-341.
 - b. Duties of the Contractor shall be per Section 4-343.
 - c. Verified Reports per Section 4-336.
 5. Contractor shall keep and make available a copy of Part I and II of the most current version of Title 24 at the Site during construction.
 6. Contractor shall notify the Division of State Architect (“DSA”) upon the start of construction per Section 4-334 if applicable.
 7. Addenda and Change Orders per Section 4-338.

1.6 CODES

- A. Codes that apply to Contract Documents include, but are not limited to, the following:
 1. 2016 California Building Code, Part 2, Title 24 (2015 International Building Code and California Amendments)
 2. 2016 California Electrical Code, Part 3, Title 24 (2015 National Electrical Code and California Amendments)
 3. 2016 California Mechanical Code, Part 4, Title 24 (2015 National Mechanical Code and California Amendments)

4. California Fire Code, Part 9, Title 24 C.C.R. (2015 International Fire Code with 2016 California Amendments)
5. California Elevator Safety Construction Code, Part 7, Title 24 C.C.R.
6. California Referenced Standards Code, Part 12, Title 24 (2015 International Building Code Standards, California Amendments, and 2015 California Fire Code)
7. Public Safety, Title 19, California Code of Regulations, State Fire Marshal Regulations
8. National Fire Protection Association (NFPA) 72, Local Alarm Systems, 2015 Edition with California Amendments - California Building Code 3504
9. NFPA 13 (fire sprinkler systems)
10. NFPA 72 Chapter 5, Automatic Fire Detectors, 2015 Edition (Calif. Electrical Code 760-1)
11. NFPA 72 Chapter 6, Notification Appliances, 2015 Edition with 2016 California Amendments - California Building Code 3504
12. NFPA 72 Chapter 7, Testing Procedures, 2015 Edition
13. California Public Utilities Commission (PUC), General Orders 95 and 128.
14. California Code of Regulations (CCR):
 - a. Title 8, Industrial Relations (Cal/OSHA Standards).
 - b. Title 24, State Access Compliance.
15. California Air Resources Board (CARB), and in particular Rule 1113.
16. Bay Area Air Quality Management District Rules & Regulations.
17. State Water Resources Control Board Waste Discharge Requirements
18. County ordinances and regulations.
19. Other codes as specified.

1.7 LAWS, ORDINANCES, RULES, AND REGULATIONS

- A. During prosecution of Work to be done under Contract Documents, comply with applicable laws, ordinances, rules and regulations, including, but not limited to, the following:
 1. Federal:
 - a. Americans with Disabilities Act of 1990, and applicable amendments.
 - b. 29 CFR, Section 1910.1001, Asbestos
 - c. 40 CFR, Subpart M, National Emission Standards for Asbestos
 - d. Executive Order 11246
 - e. Federal endangered Species Act
 - f. Clean Water Act
 2. State of California:
 - a. California Code of Regulations, Titles 5, 8, 19, 21, 22, 24 and 25
 - b. California Public Contract Code
 - c. California Health and Safety Code
 - d. California Government Code
 - e. California Labor Code

- f. California Civil code
 - g. California Code of Civil Procedure
 - h. CPUC General Order 95, Rules for Overhead Electric Line Construction
 - i. CPUC General Order 128, Rules for Construction of Underground Electric Supply and Communications systems
 - j. Cal/OSHA
 - k. OSHA: Hazard Communications Standards
 - l. California Endangered Species Act
 - m. Water Code
3. State of California Agencies:
- a. State and Consumer Services Agency
 - b. Office of the State Fire Marshall
 - c. Not used
 - d. Bay Area Air Quality Management District
 - e. North Coast Regional Water Quality Control Board
 - f. Division of the State Architect
4. Local Agencies:
- a. Humboldt County
 - b. City of Eureka, California
 - c. Humboldt Bay Fire Protection District
5. Other Requirements:
- a. National Fire Protection Association (NFPA): Pamphlet 101, Life Safety.
 - b. References on Drawings on in specifications to “code” or “building code” not otherwise identified shall mean the cods specified in this Section 01 41 00 together with all additions, amendments, changes, and interpretations adopted by code authorities of the jurisdiction.
- B. Contractor shall have immediate access to all of the foregoing.
- C. Other Applicable Laws, Ordinances and Regulations:
- 1. Work shall be accomplished in conformance with all applicable laws, ordinances, rules and regulations of federal, state, and local governmental agencies and jurisdictions having authority over the Project.
 - 2. Work shall be accomplished in conformance with all rules and regulations of public utilities and utility districts.
 - 3. Where such laws, ordinances, rules and regulations require more care or greater time to accomplish Work, or require better quality, higher standards or greater size of products, Work shall be accomplished in conformance to such requirements with no change to the Contract Time and Contract Sum, except where changes in laws, ordinances, rules and regulations occur subsequent to the time of opening of the Proposals.
- D. Under California Government Code Section 930.2 et. Seq. and Public Contract Code Section 7105(d)(2), neither the Contract Claims Procedure nor the Change Order Procedure may be

modified, waived, or otherwise not complied with, absent a written change order that explicitly and expressly makes such modifications.

1.8 CONFLICTS

- A. Between reference regulatory requirements: Comply with the one establishing the more stringent requirement.
- B. Between referenced regulatory requirements and Contract Documents: Comply with the one establishing the more stringent requirement.

1.9 COMPLIANCE WITH AMERICANS WITH DISABILITIES ACT

- A. Contractor acknowledges that, pursuant to the Americans with Disabilities Act (ADA), programs, services and other activities provided by a public entity to the public, whether directly or through a contractor, must be accessible to people with disabilities. Contractor shall provide the services specified in the Contract Documents in a manner that complies with the ADA and any and all other applicable federal, state and local disability rights legislation. Contractor agrees not to discriminate against people with disabilities in the provision of services, benefits, or activities provided and further agrees that any violation of this prohibition on the part of Contractor, its employees, agents or assigns shall constitute a material breach of the Contract Documents.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

Not Used.

END OF SECTION 01 41 00

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**SECTION 01 42 00
REFERENCES**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. All Contract Documents shall be reviewed for applicable provisions related to the provisions in this document, and provisions in the General Conditions and other Division 1 Specification Sections shall apply to this Section without limitation.

1.2 RELATED REQUIREMENTS SPECIFIED IN OTHER SECTIONS

- A. Section 01 11 00 – “Summary of Work”
- B. Section 01 31 19 – “Project Meetings”
- C. Section 01 41 00 – “Regulatory Requirements”
- D. Section 01 77 00 – “Closeout Procedures”
- E. Division 2 through 41 for References requirements for the work in those Sections.

1.3 INDUSTRY STANDARDS

- A. Applicability of Standards: Unless the Contract Documents specify more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.
- B. Publication Dates: Comply with standards in effect as of date of the Contract Documents, unless otherwise indicated.
- C. Conflicting Requirements: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to Architect for a decision before proceeding.
 - 1. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.
- D. Copies of Standards: Each entity engaged in construction on the Project must be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not contained within the Contract Documents.
 - 1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source and make them available on request.
- E. Abbreviations and Acronyms for Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name

of the entities indicated in Gale Research's "Encyclopedia of Associations" or in Columbia Books' "National Trade & Professional Associations of the U.S."

- F. Abbreviations and Acronyms for Code Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities.
- H. Abbreviations and Acronyms for Federal Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities.
- I. Abbreviations and Acronyms for State Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

Not Used.

END OF SECTION 01 42 00

SECTION 01 43 39

MOCKUPS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for the following:
 - 1. Mockups, as follows:
 - a. Standalone Mockups.
 - b. First-in-Place Material Mockups.
 - 2. Quality control, special testing, and inspection of mockups.

- B. Materials to be furnished under the Contract Documents are subject to testing and inspection for compliance with the Drawings and Specifications. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
 - 1. Specific quality assurance and control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
 - 2. Specified tests, inspections, and related actions do not limit Contractor’s other quality assurance and control procedures that facilitate compliance with the Contract Document requirements.
 - 3. Requirements for Contractor to provide quality assurance and control services required by other Specification Sections or by the District are not limited by provisions of this Section.

- C. Mockups, testing, and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
 - 1. Specific mockup and testing requirements for individual elements of the Work are specified in the Sections that specify that Work. Requirements in those Sections may also cover production of standard products.
 - 2. Specified mockups, tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
 - 3. Requirements for Contractor to provide mockup construction and testing, including those required by authorities having jurisdiction, are not limited by provisions of this Section.

- D. Related Sections include the following:
 - 1. Section 01 45 00 “Quality Control” for general testing and inspection requirements.
 - 2. Divisions 02 through 41 Sections for specific mockup requirements. (Refer to “Exhibit A” at the end of this Section)

1.2 DEFINITIONS

- A. Mockups: Full-size physical assemblies that are constructed on-site. Mockups are constructed to verify selections made under Sample submittals; to demonstrate aesthetic effects and, where indicated, qualities of materials and execution; to review coordination, testing, or operation; to show interface between adjacent materials and systems; and to demonstrate compliance with specified installation tolerances. Unless otherwise indicated, approved mockups establish the standard by which the Work will be judged.
 - 1. Standalone Mockups:
 - a. Mockups of the exterior envelope erected separately from the building but on Project site, consisting of multiple products, assemblies, and subassemblies.
 - b. Mockups of polished concrete flooring to establish visual and performance parameters of Design Reference Sample.
 - c. Mockup of exterior paving.
 - 2. Building Integrated Mockups (First-in-Place): Mockups erected into the building fabric. These mockups, if successful, may be left in place as part of the completed work at the sole discretion of the Architect and District.
- B. Quality Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
- C. Quality Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by District’s Representative.
- D. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
- E. NVLAP: A testing agency accredited according to the National Institute of Standards and Technology’s (NIST’s) National Voluntary Laboratory Accreditation Program.
- F. Preconstruction Testing: Tests and inspections that are performed specifically for the Project before products and materials are incorporated into the Work to verify performance or compliance with specified criteria.
- G. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to District’s Representative, to establish product performance and compliance with industry standards.
- H. Source Quality Control Testing: Tests and inspections that are performed at the source (i.e., a plant, mill, factory, or shop).
- I. Field Quality Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- J. Testing Agency: An entity engaged to perform specific tests, inspections, or both that is certified as meeting the requirements applicable to the Work. Testing laboratory shall mean the same as testing agency.

- K. Testing, Inspection and Observation (TIO) Program: A program prepared for approval prior to issuance of the building permit that identifies the materials and tests to be performed on a project and the firm(s) and/or individual(s) responsible for performing those tests including, at a minimum, those required by applicable sections of the California Building Standards Code.
- L. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee or Subcontractor of any tier to perform a particular construction operation, including installation, erection, application, and similar operations.
 - 1. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade(s).
- M. Experienced: As used herein, an individual or entity that has successfully completed a minimum of five previous projects similar in size and scope to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction to work in California.

1.3 CONFLICTING REQUIREMENTS

- A. General: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to District’s Representative for a decision before proceeding.
- B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to District’s Representative for a decision before proceeding.

1.4 ACTION SUBMITTALS

- A. Shop Drawings: For each type of integrated exterior mockup and for standalone mockups, provide plans, sections, and elevations, indicating materials and size of mockup construction.
 - 1. Indicate manufacturer and model number of individual components.
 - 2. Provide axonometric drawings for conditions difficult to illustrate in two dimensions.
 - 3. Submit detailed shop drawing of component exterior enclosure assembly. Drawing shall include all details for all components required for each composite exterior enclosure assembly mockup, required supports, water collection and drainage systems, anchorage, and other required work to complete composite mockup.
- B. List of Materials Used in Constructing Mockups: List generic product names together with manufacturers, manufacturers' product names, model numbers, lot numbers, batch numbers, finish and color designations, source of supply, and other information as required to identify materials used. Include mix proportions for mortar and grout and source of aggregates.
- C. Sample Construction: Process submittal for field samples as specified for product submittal, for documentation.

- D. Delegated-Design Submittal: For standalone mockups to comply with structural requirements, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified professional engineer.
- B. Testing Agency Qualifications: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.
- C. Installation Instructions:
 - 1. Include instructions specific to the use and conditions, including:
 - a. Sequence of component/assembly
 - b. Direction of operations for installation, unitized systems erection.
 - c. Surface preparation requirements.
 - d. All components of the system.
 - e. Coordination requirements for adjacent systems where appropriate.
 - 2. Provide 3 dimensional and "exploded views" to address components not easily expressed in orthographic drawings.
 - 3. Maintain mockup installation instructions for mockup erection on location and make available to all parties throughout mockup construction, testing, and reference.
- D. Contractor's Mockup and Testing Plan: For quality-assurance and quality-control activities and responsibilities concerning mockups.
- E. Mock-up Completion: Process submittal for documentation when mock-up is complete.

1.6 CONTRACTOR'S MOCKUP AND TESTING PLAN

- A. Mockup and Testing Plan, General: Submit plan for mockup fabrication, construction, and testing before proceeding with Project submittals for associated exterior envelope Work.
 - 1. Include the following information in this plan, at a minimum:
 - a. Mockup shop drawing and submittals schedule.
 - b. Lead time for obtaining required mockup materials.
 - c. Times for testing, and if necessary, retesting of mockups.
- B. Schedule of Tests and Inspections: Prepare in tabular form and include the following:
 - 1. Specification Section number and title.
 - 2. Entity responsible for performing tests.
 - 3. Description of test.
 - 4. Identification of applicable standards.
 - 5. Identification of test methods.
 - 6. Number of tests required.
 - 7. Time schedule or time span for tests.
 - 8. Requirements for obtaining samples.
 - 9. Unique characteristics of each quality-control service.

1.7 REPORTS AND DOCUMENTS

- A. Test Reports: Prepare and submit certified written reports specified in other Sections. Include the following:
 1. Date of issue.
 2. Project title and number.
 3. Name, address, and telephone number of testing agency.
 4. Dates and locations of samples and tests.
 5. Names of individuals making tests.
 6. Description of the Work and test method.
 7. Identification of product and Specification Section.
 8. Complete inspection data.
 9. Test results and an interpretation of test results.
 10. Record of temperature and weather conditions at time of testing.
 11. Comments or professional opinion on whether tested Work complies with the Contract Document requirements.
 12. Name and signature of laboratory inspector.
 13. Recommendations on retesting and re-inspecting.

1.8 GENERAL REQUIREMENTS FOR MOCK-UPS

- A. Maintain quality control over Work of various Section of Specifications, manufacturers, products, services, workmanship, and site conditions to produce mock-ups in accordance with the Contract Documents.
- B. Pre-Installation Conference
 1. Conduct pre-installation conference in accordance with Division 01 requirements.
 2. Convene pre-installation conference at least one week prior to commencing work on Mockups.
- C. Workmanship:
 1. Comply with standards specified in technical specification sections.
 2. Provide qualified personnel to produce mock-up of specified quality.
 - a. Use products, materials, finishes, fabrication methods, details, anchorage system, and construction methods identical with those required for the Work.
 - b. Use a supervisor who will be involved in the actual construction.
 3. Secure mock-ups in place with positive anchorage devices designed and sized to withstand stresses, vibration, and tests.
 4. Provide finish to match approved samples.
- D. Assemble and erect complete, with specified attachment and anchorage devices, flashings, seals and finishes.
 1. Anchorage and assembly shall conform to code requirements for seismic stability.
 2. Include, as part of the mock-up, required shoring and bracing to support mock-up.
 3. Coordinate mock-up construction with delivery and assembly of related materials and components to be included in each mock-up.
- E. Visual examination and testing of composite exterior enclosure assembly mockup shall be completed prior to fabrication and installation of any component system.

- F. Correct work installed within the composite exterior enclosure assembly mockup which is not acceptable to the District's Representative or does not pass testing requirements at no additional cost to the District. Correct subsequent installations elsewhere in the Work, which is not in accordance with the approved mockup at no additional cost to the District.
- G. District's approval of component exterior enclosure assembly mockup will not relieve Contractor of the responsibility for any deviations from the requirements of the Contract Documents unless Contractor has specifically informed the District's Representative in writing of any deviation at the time of the mockup review and the District's Representative has given written approval of the specific deviation.
- H. Make necessary additions and modifications to the details shown on the Drawings as may be required to comply with specified performance requirements while maintaining the design concept.
- I. Maintain composite exterior enclosure assembly mockup in a clean and undamaged condition during construction and dispose of mockups when no longer required as determined by District's Representative.
- J. Exterior Enclosure Mockup support framing, seismic bracing, connections, and related hardware shall be designed under the direct supervision of a Professional Engineer experienced in the design of the work, registered and licensed in the state of California, using performance and design criteria and requirements specified.

1.9 DESCRIPTION OF MOCK-UPS

- A. First-in-Place Mockups: Refer to individual Specification Sections for requirements. These mockups may remain in place after approval.
- B. Standalone Composite Exterior Enclosure: Free-standing composite exterior enclosure assembly mockup to be constructed at a location near the Project site, as shown on the Drawings, or, if not shown, as directed by Architect.
 - 1. This mockup will be constructed "out of sequence" with respect to normal sequence of construction of component parts of the exterior enclosure to obtain approval by Architect before commencing with the work represented by the composite exterior enclosure mockup.
 - 2. Construct mockup as shown on the Drawings.
 - 3. Mockup shall include:
 - a. Exterior wall assembly components as specified in Division 04 Section "Brick Masonry", Division 05 Section "Cold-Formed Metal Framing", Division 06 Section "Sheathing", Division 07 Sections for "Thermal Insulation", "Air Barriers", and "Sheet Metal Flashing and Trim."
 - b. Metal wall panels as specified in Division 07 Section "Metal Wall Panels."
 - c. Joint sealants as specified in Division 07 Section "Joint Sealants."
 - d. Flashings as specified in Division 04 "Brick Masonry" and Division 07 Section "Sheet Metal Flashing and Trim."
 - e. Exterior hollow metal frames as specified in Division 08 Section "Hollow Metal Doors and Frames."
 - f. Glazed-aluminum curtain wall systems as specified in Division 08 Section "Glazed-Aluminum Curtain Walls" and Structural-Sealant-Glazed Curtain Walls."

- g. Glazing as specified in Division 08 Section "Glazing."
 - h. Cement plastering as specified in Division 09 Section "Cement Plastering."
 - 4. Demolish and remove mockup when directed by Architect.
- C. Polished Concrete: Mockup to be constructed at location near the Project Site, as directed by Architect.
- 1. This mockup will be constructed "out of sequence" with respect to normal sequence of construction to obtain approval by Architect before commencing of work represented by the polished concrete mockup.
 - 2. Size: Minimum 10 feet by 10 feet.
 - 3. Demolish and remove mockup when directed by Architect.
- D. Site Concrete: Mockup to be constructed at location near the Project Site, as directed by Architect.
- 1. This mockup will be constructed "out of sequence" with respect to normal sequence of construction to obtain approval by Architect before commencing of work represented by the site concrete mockup.
 - 2. Demolish and remove mockup when directed by Architect.

1.10 QUALITY ASSURANCE

- A. General: Qualifications paragraphs in this Article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
- B. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance. Installers shall be qualified by the product or equipment manufacturer, if required for warranty or other performance guarantees.
- C. Manufacturer Qualifications: A firm experienced in fabricating products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units as required to meet the Project schedule.
- D. Fabricator Qualifications: A firm experienced in procuring and fabricating products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units as required to meet the Project schedule.
- E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in California and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of systems, assemblies, or products that are similar to those indicated for this Project in material, design, and extent.
- F. Specialists: Certain sections of the Specifications require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.
 - 1. Requirement for specialists shall not supersede building codes and regulations

governing the Work.

- G. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, including the requirements of ASTM D3666, D3740, E329, E543, and E548 as applicable; and with additional qualifications specified in individual Sections; and that is acceptable to District. All testing shall be performed under the supervision and control of a California registered professional engineer employed by the testing agency.
- H. Factory-Authorized Service Representative Qualifications: An authorized representative of a manufacturer who is trained and approved by the manufacturer to inspect installation of the manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- I. Preconstruction Laboratory Testing: Where testing agency is indicated to perform preconstruction laboratory testing for compliance with specified requirements for performance and test methods, comply with the following:
 - 1. Contractor responsibilities include the following:
 - a. Provide test specimens representative of proposed products and construction.
 - b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
 - 2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Architect with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.
- J. Mockups, General: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:
 - 1. Build on-site field mockups and sample panels in location indicated or, if not indicated, as directed by Architect. Provide the following types as indicated:
 - a. Standalone Exterior Enclosure Mockups: Include material and products indicated in Drawings. Provide composite Shop Drawings for Architect approval.
 - b. Building Integrated First-in-Place Mockups: Build portion of Work and obtain Architects approval before proceeding.
 - c. Preconstruction Testing: When required, either as part of preconstruction mockup or as required by individual Sections, provide material to testing agency for testing prior to commencement of that portion of Work.
 - 2. Notify Architect and District at least 7 days in advance of dates and times when mockups will be constructed, unless otherwise indicated or required.
 - 3. Employ supervisory personnel who will oversee mockup construction. Employ workers that will be employed during the construction at Project.
 - 4. Demonstrate the proposed range of aesthetic effects and workmanship.
 - 5. Obtain Architect's, and District's approval of mockups before starting work, fabrication, or construction.
 - a. Allow seven days for initial review and each re-review of each mockup.
 - 6. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.

7. Demolish and remove mockups when directed by Architect or District unless otherwise indicated.
- K. Standalone Exterior Enclosure Mockups: Prior to commencing exterior construction, build freestanding composite mockup of exterior assemblies as indicated on Drawings. Coordinate installation of exterior envelope materials and products for which mockups are required in individual Specification Sections, along with supporting materials.
1. Construct stand-alone mockup as indicated for visual observation and performance testing indicated.
 2. Visual Mockups Review: Construct stand-alone mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 3. Performance Testing: Follow indicated testing procedures for Field Quality Control testing and inspections, unless otherwise indicated.
- L. Building Integrated First-in-Place Mockups: Install portion of material or product indicated for visual review by Architect and District and/or for performance testing in actual facility. Coordinate installation of specified materials and products for which mockups are required in individual Specification Sections, along with supporting materials.
1. Construct in-place mockup in size or configuration indicated in individual Specification Sections, or as directed by Architect.
 2. Visual Mockups Review: Construct in-place mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 3. Performance Testing: Follow indicated testing procedures for Field Quality Control testing and inspections, unless otherwise indicated.
 4. Obtain Architect's approval prior to commencement of remaining Work of that section.
- M. Preconstruction Laboratory Testing: Comply with requirements of preconstruction testing as specified in individual Specification Sections, including, but not necessarily limited to, the following:
1. Concrete testing.
 2. Joint Sealant Compatibility and Adhesion testing.
 3. Structural sealant testing.

1.11 QUALITY CONTROL

- A. District Responsibilities: Where quality control services for mockups are indicated as District's responsibility, District will engage a qualified testing agency to perform these services.
1. Specified inspection and testing shall be performed in accordance with Part 1, Title 24, Article 4, Paragraph 7-149, California Code of Regulations.
 2. District will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of the types of testing and inspections they are engaged to perform.
 3. Payment for these services will be by the District.
 4. Costs for retesting and re-inspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.
 5. District's Project Inspector:

- a. A Project Inspector employed by the District in accordance with the requirements of the California Building Code will be assigned to the work. The Project Inspector's duties are specifically defined in CCR Title 24 Part 1.
 - b. The Contractor shall notify the Project Inspector a minimum of 2 working days in advance of execution of all Work that requires inspection.
 - c. The Work in all stages of progress shall be subject to the personal continuous observation of the Project Inspector. He or she shall have free and safe access to any or all parts of the work at any time. The Contractor shall furnish the Project Inspector reasonable facilities for obtaining such information as may be necessary to keep him fully informed respecting the progress and manner of the work and the character of the materials. Inspection of the work shall not relieve the Contractor from any obligation to fulfill this Contract.
- B. Contractor Responsibilities: Tests and inspections not explicitly assigned to District are Contractor's responsibility. Perform additional quality-control activities required to verify that the Work complies with requirements, whether specified or not.
- 1. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
 - 2. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.
 - a. Contractor shall not employ same entity engaged by District, unless agreed to in writing by District.
 - 3. Schedule testing agencies functions sufficiently in advance of testing or inspecting to allow Architect and Construction Manager observations.
 - 4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
 - 5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
- C. Manufacturer's/Fabricator's Technical Services: Engage manufacturer's technical representatives to observe and inspect the mockups. Manufacturer's technical representative's services include participation in preinstallation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed mockups, witnessing testing, and submittal of written reports.
- D. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.
- E. Testing Agency Responsibilities: Cooperate with Architect and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
- 1. Notify Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
 - 2. Coordinate the location from which test samples will be taken and in which in-situ tests are conducted.
 - 3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.

4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
 5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
 6. Do not perform any duties of Contractor.
- F. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
1. Access to the Work.
 2. Incidental labor and facilities necessary to facilitate tests and inspections.
 3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
- G. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
1. Schedule times for tests, inspections, obtaining samples, and similar activities.
- H. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents. Coordinate and submit concurrently with Contractor's construction schedule. Update as the Work progresses.
1. Distribution: Distribute schedule to District, Architect, testing agencies, and each party involved in performance of portions of the mockups and testing.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Except as otherwise specified, materials for mock-up shall be as shown and specified in the respective Specification Sections.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine site and area to receive mock-up and conditions under which mock-ups are to be constructed. Correct any deficiencies.

3.2 REVIEW AND ACCEPTANCE

- A. Upon completion of mock-up construction, notify Architect and District's Representative and make arrangements for review.
- B. Acceptable mock-ups shall become the standard of quality for the Work, as approved by Architect.
- C. Maintain mock-ups in a neat, clean, and "as-accepted" conditions.
- D. Mock-ups shall be completed and shall be approved by the Architect in writing, prior to commencing with Work.

- E. Modify the mock-ups, or construct new components if requested by the Architect or District's Representative, for further evaluation and until final acceptance is obtained.

3.3 TESTING OF COMPOSITE EXTERIOR ENCLOSURE ASSEMBLY

- A. Conduct testing in the presence of Architect and District Representative. Provide minimum one week prior notice of date and time of testing, unless otherwise indicated.
- B. Composite exterior enclosure assembly mockup is subject to observation and inspection by Architect and District throughout construction and testing.
- C. Construct test chamber in accordance with procedures and requirements of ASTM E 1105. Construct portable negative pressure enclosure unit sealed against the composite exterior wall mock-ups on the indoor side, and use suspended pipe grid with nozzles to supply the required water flow to the exterior of composite exterior wall mockups. Provide test enclosure equivalent in size to composite exterior wall mockups, unless directed otherwise. Provide air system, pressure measuring apparatus, and water-spray system in accordance with ASTM E 1105.
 - 1. Perform water penetration tests on exterior glazed openings in accordance with procedures and requirements of ASTM E 1105, Procedure B with at least 3 cycles. Water-spray system shall deliver water uniformly against exterior surface of composite exterior wall mock-up at a minimum rate of 5 gallons per square foot per hour. Test pressure shall be an air pressure difference of 20 percent of design pressure, with minimum differential of 6.24 lbf/ft² and maximum of 12.0 lbf/ft².
 - 2. Perform a separate water penetration tests of the portland cement plaster assembly including wall system, sheathing, air barriers, including reveals, control joints, trim, and joints with adjacent materials using a modified ASTM E 1105 test for which no chamber test is required. Spray water into the mockup at a rate of 5 gallons per square foot per hour for a period of 1.5 hours.
 - 3. Water Leakage: Water leakage is defined as any controlled water that appears on any normally exposed interior surfaces, that is not contained or drained back to the exterior, or that can cause damage to adjacent materials or finishes. Water contained within drained flashings, gutters, and sills is not considered water leakage.
 - 4. Prepare test reports as required by ASTM E 1105.
 - 5. If water leakage occurs, revise and retest composite exterior wall mock-ups. Modifications must be realistic in terms of job conditions, must maintain standards of quality and durability, and are subject to review and action by Project Manager. Leave composite exterior wall mock-ups in place during installation of work
 - 6. Approval of composite exterior wall mock-ups is a prerequisite for final approval of component Shop Drawings.

3.4 TEST AND INSPECTION LOG

- A. Tracking: Prepare plan and elevations indicating locations and results of testing for integrated exterior mockups. Update testing completion as work proceeds.
- B. Prepare a sequentially numbered record of tests and inspections. Include the following:
 - 1. Request for Inspection
 - 2. Date test or inspection was conducted.
 - 3. Description of the Work tested or inspected.

4. Applicable Construction Drawing and Specification numbers
 5. Date test or inspection results were transmitted to District's Representative.
 6. Identification of testing agency or special inspector conducting test or inspection.
- C. Maintain log at Site. Post changes and modifications as they occur. Provide access to test and inspection log for District and its representatives' reference during normal working hours.
- D. Submit: With record documents.
1. Provide updated copies of documents to Architect and Construction Manager upon completion of mockups and testing by type and location.

3.5 REPAIR AND PROTECTION

- A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
1. Comply with the Contract Document requirements for cutting and patching.
- B. Protect construction exposed by or for quality control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality control services.
- D. Protect standalone mockups until released for demolition or removal from Site by Architect and District.

3.6 REMOVAL

- A. Remove unacceptable mock-ups.
- B. Except as otherwise specified, remove free-standing mock-ups which are not to be permanent prior to completion of Project when directed by Architect but not before the work they are being used to judge has been accepted by Architect.

END OF SECTION 01 43 39

SECTION 01400
QUALITY CONTROL REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. All Contract Documents shall be reviewed for applicable provisions related to the provisions in this document, and provisions in the General Conditions and other Division 1 Specification Sections shall apply to this Section without limitation.

1.2 RELATED REQUIREMENTS SPECIFIED IN OTHER SECTIONS

- A. Section 01 11 00 – “Summary of Work”
- B. Section 01 31 00 – “Project Management and Coordination”
- C. Section 01 33 00 – “Submittal Procedures”
- D. Section 01 41 00 – “Regulatory Requirements”
- E. Section 01 45 29 – “Testing Laboratory Services”
- F. Section 01 66 13 – “Product Storage and Handling Requirements for Hazardous Material”
- G. Divisions 2 through 41 Sections for Quality Control Requirements for the work in those sections.

1.3 SUMMARY

- A. This Section includes Administrative and Procedural Requirements for Quality Control and Quality Assurance Services includes, but not limited to, the followings:
 - 1. Quality assurance and control of installation.
 - 2. References.
 - 3. Mock-ups
 - 4. Inspection and testing laboratory services
 - 5. Manufacturers’ field services and reports
 - 6. Field sample
 - 7. DSA Project Inspector
 - 8. Inspection by the Division of the State Architect
 - 9. Conflicts

1.4 QUALITY ASSURANCE/CONTROL OF INSTALLATION

- A. Monitor quality control over suppliers, manufacturers, products, services, site conditions and workmanship, to produce Work of specified quality.
- B. Comply fully with manufacturer’s written instructions, including each step, in sequence.
- C. When manufacturers' instructions conflict with Contract Documents, request clarification from District’s Representative before proceeding.

- D. Comply with specified standards as a minimum quality for the Work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. All Work shall be performed by persons qualified to produce workmanship of specified quality.
- F. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion or disfigurement.
- G. Contractor's Line of Authority: Contractor shall provide one person who shall be both knowledgeable and responsible for all work to be performed on the Project at all times during normal work hours. In Contractor's absence, Contractor's appointed representative shall be responsible for all directions given and said directions shall be binding as if given to the Contractor. Contractor's representative shall be responsible to coordinate all work to be performed on the Project.
- H. Shop and field work shall be performed only by mechanics skilled and experienced in the fabrication and installation of the work involved. All work on this Project shall be performed in accordance with the best practices of the various trades involved and in accordance with the Contract Documents, approved shop drawings and these specifications.
- I. All work shall be erected and installed plumb, level, square and true and in proper alignment and relationship to the work of other trades. All finished work shall be free from defects. The District's Representatives reserve the right to reject any materials and workmanship that are not considered to be of the highest standards of the trades involved. Any such inferior material or workmanship shall be removed and replaced at no additional cost or time impact to the District.
- J. The specifications and recommendations of the manufacturer whose materials are used shall be strictly adhered to during the application or installation of materials. Manufacturer's specifications, installation instructions, and testing and startup directions shall be available for inspection on Site.
- K. Any additional work beyond that specified or illustrated in the Contract Documents, or any modification thereto, that is necessary to obtain the guarantees specified in the Contract Documents shall be provided by the Contractor without any additional cost or time impact to the District.

1.5 REFERENCES

- A. Conform to reference standards in force on the most recent date of issue of the approved Contract Documents.
- B. When specified reference standards conflict with Contract Documents, request clarification from District's Representative before proceeding.
- C. The contractual relationship of the parties to the Contract shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.
- D. The Contractor shall be responsible for being current and knowledgeable for all building codes involved for all trades under the Contractor's direction.
- E. Provide all work and materials in full in accordance with the latest applicable Rules and Regulations of the California Code of Regulations Title 24 Building Code Standards, the State Fire Marshal, Safety Orders of the Division of Industrial Safety, and any other applicable laws or

regulations. Nothing in these plans or specifications is to be construed to permit Work not conforming to these Codes.

- F. American Society for Testing and Materials (ASTM):
 - 1. ASTM 548: Guide for General Criteria Used for Evaluating Laboratory Competence.
- G. Code of Federal Regulations (CFR):
 - 1. 29 CFR 1910, Subpart A, Section 1910.7: Definitions and Requirements for a National Recognized Testing Laboratory.
- H. NIST: National Institute of Standards and Technology.
- I. Furnish all material and labor required to comply with these Rules and Regulations without any additional cost to District.

1.6 MOCK-UPS - (See Section 01 43 39)

1.7 INSPECTION AND TESTING LABORATORY SERVICES

- A. See Section 01 45 29 Testing Laboratory Services

1.8 MANUFACTURERS' FIELD SERVICES AND REPORTS

- A. Submit qualifications of observer to District and Architect 30 days in advance of required observations.
- B. When specified in individual Specification Sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, testing, adjusting, and balancing of equipment as applicable, and to provide instructions when necessary.
- C. Manufacturer's Field Representatives shall report to the Contractor and the District, any observations, site decisions, or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.
- D. Provide by email PDF of Manufacturer's Field Representative report to District for review within 7 days of field observation.
- E. Manufacturer's Field Service: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Section 01 33 00 (Submittal Procedures.)

1.9 FIELD SAMPLES

- A. Install field samples at the site for District and Architect review as required by individual Specifications Sections.
- B. Samples accepted by the Architect in writing represent the quality level required for the Work.
- C. Where a field sample is specified in individual sections to be removed, clear area after field sample has been accepted by Architect.

1.10 PROJECT INSPECTOR

- A. District will employ a Project Inspector in accordance with the regulations of the DSA and subject to the provision of Part 1, Title 24, CCR.
- B. Project Inspector's authority, rights and duties shall be as set forth in Section 4-342, Part 1, Title, 24, CCR.
- C. The Project Inspector shall make semi-monthly reports in writing to the Architect with copies forwarded to District, and the DSA in accordance with Section 4-337, Part 1, Title 24, CCR.
- D. The Project Inspector shall notify the Division of the State Architect:
 - 1. When work is started on project.
 - 2. Minimum (2) working days in advance of time when foundation trenches will be complete and ready for footing forms.
 - 3. Minimum (2) working days in advance for first placing of concrete.
 - 4. When work is suspended for period of more than two weeks.
- E. The Project Inspector shall keep records of certain phases of construction that shall be maintained on the project site until Final Completion. Upon Final Completion, these records shall be copied, with the original delivered to the District for the permanent school records and the copy forwarded to the Architect. The record shall include, but is not limited, to the following:
 - 1. The time and placing of concrete and the time and date of removal of forms in each portion of the structure.
 - 2. Weighmasters tickets delivered with each load of concrete delivered to site.
 - 3. Identification marks of welders, lists of defective welds, and manner of correction of defects.
 - 4. Certification of grounding of electrical system.
- F. The Project Inspector shall monitor the work of Special Inspectors and testing laboratories to ensure testing program is satisfactorily completed.
- G. The Project Inspector shall notify the Contractor in writing of deviations from Contract Documents. Copies of such notice shall be forwarded immediately to the Architect, District and the Division of the State Architect (DSA).
- H. The Project Inspector shall make and submit Verified Reports in accordance with Section 4-336, Part 1, Title 24, CCR. Verified Reports shall be submitted directly to the Division of the State Architect with a copy forwarded to the Architect.
- I. The Project Inspector shall prepare detailed statements of fact regarding materials, operations and other related issues when requested by the District. Such statements shall be submitted directly to the District with a copy forwarded to the Architect.
- J. The District may employ roofing and waterproofing specialist (e.g., other District inspectors, in addition to the Project Inspector to inspect and monitor application of roofing, waterproofing, and related flashings.
- K. Contractor shall cooperate with the Project inspector and other District inspectors. Provide access to the work at all times whether it is in preparation or progress. Provide proper facilities for access and inspection.

- L. Perform work with the knowledge of the Project Inspector. Cover no work prior to inspection.
- M. Notify Project Inspector in writing at least (2) working days prior to expected time for operations requiring inspection.
- N. If work is performed on Saturdays, Sundays, Holidays or beyond normal working hours, the Project Inspector, or other District inspectors, will be paid at overtime rates by the District. The cost of the Inspectors' premium time will be deducted by the District from the Contract Price by Change Order.
- O. The Contractor shall pay the cost of the Inspector's salary for the time the Inspector is required on the project beyond the allotted Contract Time. The cost of the Inspector's salary shall be in addition to liquidated damages and will be deducted by the District from the Contract Price by Change Order.

1.11 INSPECTION BY THE DIVISION OF THE STATE ARCHITECT

- A. Work will be monitored and observed through periodic site visits by the Division of the State Architect Field Inspector according to Section 4-334, Part 1, Title 24, CCR.

1.12 CONFLICTS

- A. Contractor shall comply with rules of documents interpretation as indicated in Contract General Conditions including, but not limited to the following items:
 1. Contract Documents take precedence over statutory requirements or standard when requiring materials of higher quality or performance, or larger sizes or capacity, or greater protection, safety or quantity than required by said codes or standards.
 2. This shall not operate to allow deviations from code requirements, prior approvals and other provisions as specified.
 3. Modifications to published statutory requirements currently adopted or enforced by regulating agencies having jurisdiction shall take precedence over said published requirements.
- B. Conflicts within Contract Documents and/or between Project Manual (including specifications) Drawings, Addenda: The more stringent requirement shall govern.
- C. Subcontractor, supplier, and installer work may be called for in any section of the Contract Documents, Project Manual Specifications, Drawings and Addenda. Work by any one discipline is not limited to any specification section of the Project Manual, Drawings, Addenda, and Contract Documents shall be bid in total and not in parts.
- D. If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to District with a copy to the Architect for a decision before proceeding. Contractor shall, within (15) working days, notify the District with a copy to the Architect in writing for the context of requirements.
- E. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for

the context of requirements. Contractor shall, within (15) working days, notify any uncertainties to the District with a copy to the Architect for a decision before proceeding.

1.13 QUALITY ASSURANCE

- A. General: Qualifications requirements in this Article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
- B. Installer Qualifications: A firm or individual with experience in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
 - 1. Minimum Experience: 5 years or 5 similar projects, unless indicated otherwise.
- C. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- D. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to product required units.
- E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located, and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that is similar to those indicated for this Project in material, design, and extent.
- F. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 548; and with additional qualifications specified in individual Sections; and acceptable to authorities having jurisdiction.
 - 1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
 - 2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.
- G. Factory-Authorized Service Representative Qualifications: An authorized representative who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- H. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:
 - 1. Contractor responsibilities include:
 - a. Provide test specimens representative of proposed products and construction.
 - b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
 - c. Provide sizes and configurations of test assemblies, mockups, and laboratory mockups, to adequately demonstrate capability of products to comply with performance requirements.

- d. Build site-assembled test assemblies and mockups using installers who will perform same tasks for Project.
 - e. Build laboratory mockups at testing facility using personnel, products, and methods of construction indicated for the completed Work.
 - f. When testing is complete, remove test specimens, assemblies, mockups, and laboratory mockups; do not reuse products on Project.
2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to District with a copy to the Architect and Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.
- I. Pre-work Meetings: The Contractor shall hold and document Pre-work Meetings for Subcontractors at least 5 workdays prior to Subcontractors beginning work at the site for the first time. A copy of the completed New Subcontractor Preparatory Phase Checklist for each Pre-work Meeting shall be provided as an attachment to the Daily Report for that day, with a sign-in sheet for all persons that were present at the meeting. The Checklist is provided at the end of this section.
- 1. The Pre-work Meeting shall be conducted in order to review and confirm the requirements of the Work per the Contract Documents, coordinate the Work, identify required tests and inspections, and establish a goal to obtain quality construction by planning ahead and identifying potential problems.
 - 2. Notify the District at least three (3) workdays in advance of each Pre-work Meeting. Conduct the Pre-work Meeting with the superintendent and the foreman responsible for the work and any District representatives that wish to attend.
 - 3. Review the following at the Pre-work Meeting prior to allowing a Subcontractor to begin work on site:
 - a. Review the General Conditions and other Contract Specifications governing work at the Project location. Review rules governing use of workspace, parking, laydown areas, conduct of employees, and access to and from the worksite.
 - b. Review the Project Preconstruction Meeting Minutes and review pertinent portions with the new Subcontractor.
 - c. Review each paragraph of the applicable technical specification sections;
 - d. Review the Contract Drawings;
 - e. Verify that appropriate shop drawings and submittals for materials and equipment have been submitted and approved. Verify receipt of approved factory test results, when required;
 - f. Review the testing plan and ensure that provisions have been made to provide the required testing;
 - g. Examine the work area to ensure that the required preliminary work has been completed;
 - h. Examine the required materials, equipment and sample work to ensure that they are on hand and conform to the approved shop drawings and submitted data;

- i. Review the Contractor’s approved Site Safety Plan and appropriate Activity Hazard review to ensure that applicable safety requirements are met, and that required Safety Data Sheets (SDS) are submitted;
- j. Establish the quality of workmanship required;
- k. Discuss specific controls used and the construction methods and the approach that will be used to provide quality construction by planning ahead and identifying potential problems for each definable feature of work.

1.14 QUALITY CONTROL, GENERAL

- A. District will provide inspections, tests, and similar quality control services specified to be performed by independent agencies, except where indicated as Contractor’s responsibility. Costs for District-provided inspections and tests are not included in Contract Sum.
 - 1. District will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and description of types of testing and inspecting they are engaged to perform.
 - 2. Costs for retesting and re-inspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Price will be adjusted by Change Order.
- B. Where tests and inspections are indicated as Contractor’s cost and/or responsibility, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
 - 1. Where services are indicated as Contractor’s responsibility, engage a qualified testing agency to perform these quality-control services.
 - a. Contractor shall not employ same entity engaged by District, unless agreed to in writing by District.
 - 2. Testing of equipment, systems, components, assemblies, and other non-structural elements of the Work that require testing shall be performed in accordance with the Contract Documents and Manufacturer’s recommended testing protocols. The Contractor shall submit Manufacturer’s Installation Instructions and Manufacturer’s recommended tests in accordance with Section 01 33 00, Submittal Procedures, prior to installation and testing of equipment, systems, components, assemblies, and other non-structural elements of the Work. Test results shall be recorded and submitted original Manufacturer’s documents.
 - 3. Notify Project Inspector and testing agencies, at least (5) working days or as indicated otherwise in advance of time when Work that requires testing or inspecting will be performed.
 - 4. Where quality-control services are indicated as Contractor’s responsibility, submit a certified written report, in duplicate, of each quality-control service.
 - 5. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor’s responsibility.
 - 6. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

- C. Retesting/Re-inspecting:
 - 1. Where quality-control services are Contractor's responsibility, provide quality-control services, including retesting and re-inspecting, for construction that replaces or is necessitated by Work that failed to comply with the Contract Documents.
 - 2. Where quality-control services are District's responsibility, costs for retesting and re-inspecting construction that replaces or is necessitated by Work that failed to comply with the Contract Documents will be charged to Contractor, by way of a deductive Change Order.
- D. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
 - 1. Access to the Work
 - 2. Incidental labor and facilities necessary to facilitate tests and inspections
 - 3. Adequate quantities of representative samples of materials that require testing and inspecting shall be made available to the District's LOR. The District's LOR shall be responsible to make the final determination of what samples to be selected for testing.
 - 4. Facilities for storage and field curing of test samples.
 - 5. Preliminary design mix proposed for use for material mixes that require control by testing agency.
 - 6. Security and protection for samples and for testing and inspecting equipment at Project site.
- E. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
 - 1. Schedule times for tests, inspections, obtaining samples, and similar activities. Provide timely notice of the Work's readiness for all required tests and inspections.
- F. Testing and Inspection Log: The Contractor shall provide a detailed list of all Tests and Inspections required by the Contract Documents. Submit the Test and Inspection Log with the submittal of the Master CPM Schedule.
 - 1. Distribution: Distribute schedule to District with a copy to the Architect, testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

1.15 QUALITY CONTROL PROGRAM

- A. Information for the District: Prior to commencing Work, the Contractor may obtain a single copy set of the current report forms from the District. The report forms will consist of the, Contractor Production Report (Continuation Sheet), Contractor Quality Control (CQC) Report, CQC Report (Continuation Sheet), Preparatory Phase Checklist, Rework Items List, and Testing Plan and Log. Deliver the following to the District during Construction (email transmittal of Adobe pdf documents may be acceptable for reports in this section if approved in advance by the District):
 - 1. CQC Report: Mail or hand-carry the original (wet signatures) and 2 copies by 10:00 AM the next working day after each day that work is performed and for every seven consecutive calendar days of no-work.

2. Contractor Production Report: Mail or hand-carry the original (wet signatures) and 2 copies by 10:00 AM the next working day after each day that work is performed and for every seven consecutive calendar days of no-work, attached to the CQC Report.]
3. Preparatory Phase Checklist: Original attached to the original CQC Report and one copy attached to each QC Report copy.
4. Field Test Reports: Mail or hand-carry the original within two working days after the test is performed, attached to the original CQC Report and one copy attached to each QC Report copy.
5. Monthly Summary Report of Tests: Submit the report at the end of each month.
6. Testing Plan and Log: Submit the report at the end of each month.
7. Rework Items List: Submit lists containing new entries daily, in the same manner as the CQC Report.
8. CQC Meeting Minutes: Mail or hand-carry the original within two working days after the meeting is held, attached to the original CQC Report and one copy attached to each CQC Report copy.
9. QC Certifications: As required herein.

B. QUALITY CONTROL PROGRAM REQUIREMENTS

1. Contractor shall establish and maintain a QC program as described in this section. This QC program is a key element in meeting the objectives of Quality Control and systems commissioning. The QC program consists of the Contractor Organization, QC Plan, a Coordination and Mutual Understanding Meeting, QC meetings, submittal review and certification, testing, and QC certifications and documentation necessary to provide materials, equipment, workmanship, fabrication, construction and operations which comply with the requirements of this Contract.
 - a. The QA/QC program must cover on-site and off-site work and be keyed to the work sequence.
 - b. No construction work or testing may be performed unless the QA/QC Manager is on the work site.
 - c. The QA/QC Manager must report to an officer of the firm and not be subordinate to the Project Superintendent.
 - d. The QA/QC Manager, Project Superintendent and other Contractor and Subcontractor personnel must work together effectively. Although the QA/QC Manager is the primary individual responsible for quality control, all individuals will be held responsible for the quality of work on the job.
2. Acceptance of the QA/QC Plan is required prior to the start of construction. The District reserves the right to require changes in the QA/QC Plan and operations as necessary, including removal of personnel, to ensure the specified quality of work.
3. The District reserves the right to interview any member of the Contractor's organization at any time in order to verify the submitted qualifications.
4. The District may require the removal of any individual for non-compliance with quality requirements specified in the Contract.

- C. Preliminary Construction Work Authorized Prior to Acceptance. The only construction work that is authorized to proceed prior to the acceptance of the QA/QC Plan is mobilization of storage and office trailers, temporary utilities, and surveying.
- D. Notification of Changes: Notify the District, in writing, of any proposed changes in the QA/QC Plan or changes to the Contractor organization personnel, a minimum of 10 work days prior to a proposed change. Proposed changes are subject to acceptance by the District.
- E. QA/QC Manager and Duties
 - 1. The QA/QC Manager’s responsibility is to ensure the development and implementation of the Quality Control Program and to fulfill all other requirements of Section 01 45 00.
 - 2. The QA/QC Manager is required to attend the weekly meetings, conduct new subcontractor Pre-Work Preparatory Phase meetings, perform submittal review and certification, ensure testing is performed and provide QC certifications and documentation required in this Contract.
 - 3. The QA/QC Manager is responsible for managing and coordinating the documentation performed by Contractor testing laboratory personnel and any other inspection and testing personnel required by this Contract not coordinated, overseen, and paid by the District.
 - 4. Qualifications: A graduate of a four-year accredited college or university program in one of the following disciplines: Engineering, Architecture, Construction Management, Engineering Technology, Building Construction, or Building Science, with a minimum of 15-20 years’ experience as a Project Superintendent, QA/QC Manager, Project Manager, Project Engineer or Construction Manager on similar size and type construction contracts which included the major trades that are part of this Contract.
 - a. The individual must be familiar with the requirements of DSA, OSHA and Cal OSHA, and have experience in the areas of hazard identification, safety compliance, and sustainability.
 - 5. Alternate QA/QC Manager Duties and Qualifications: Designate an alternate for the QA/QC Manager at the work site to serve in the event of the designated QA/QC Manager's absence.
 - a. The period of absence may not exceed two weeks at one time, and not more than 30 workdays during a calendar year.
 - b. The qualification requirements for the Alternate QA/QC Manager must be the same as for the QA/QC Manager.

1.16 QUALITY CONTROL (QC) PLAN

- A. QC Plan Requirements: Provide, for acceptance by the District, a Construction QC Plan submitted in a three-ring binder that includes a table of contents, with major sections identified with tabs, with pages numbered sequentially, and that documents the proposed methods and responsibilities for accomplishing quality control and system commissioning activities during the construction of the Project and include:
 - 1. A chart showing the Contractor management organizational structure.
 - 2. Names and qualifications, in resume format, for each person in the Contractor management organization.
 - 3. Duties, responsibilities, and authorities of each person in the Contractor management organization, including home office personnel responsible for this Project.

4. A listing of outside organizations, such as architectural and consulting engineering firms, that will be employed by the Contractor and a description of the services these firms will provide.
 5. Letters signed by an officer of the firm appointing the QA/QC Manager and Alternate QA/QC Manager and stating that they are responsible for implementing and managing the QC program as described in this Contract. Include in this letter their authority to stop work which is not in compliance with the Contract. Include copies of the letters in the QC Plan.
 6. Procedures for reviewing, certifying, and managing submittals.
 7. Provide the name(s) of the person(s) in the QC organization authorized to review and certify submittals prior to submission to the District and Architect. Provide the initial submittal of the Submittal Log as specified in Section 01 33 00 SUBMITTAL PROCEDURES.
 8. Testing laboratory information required herein.
 9. A Testing Plan and Log that includes the tests required, referenced by the specification paragraph number requiring the test, the frequency, and the person responsible for each test. Use District forms to log and track tests.
 10. Procedures to identify, record, track, and complete rework items. Use District forms to record and track rework items.
 11. Procedures for coordinating, tracking and documenting all required certifications for subcontractors, testing laboratories, suppliers, personnel, etc.
- B. QA/QC Manager shall ensure that certifications are current, appropriate for the work being performed, and will not lapse during any period of the contract that the work is being performed.
- C. Coordination and Mutual Understanding Meeting. After submission of the QC Plan, and prior to the start of construction, the QA/QC Manager will meet with the District to present the QC program required by this Contract. When a new QA/QC Manager is appointed, the coordination and mutual understanding meeting shall be repeated.
1. Purpose: The purpose of this meeting is to develop a mutual understanding of the QC details, including documentation, administration for on-site and off-site work, coordination of activities to be performed, and the coordination of the Contractor's management, production, and QC personnel. At the meeting, the Contractor will be required to explain in detail each management plan or requirement as listed below:
 - a. Waste Management Plan.
 - b. Storm water Pollution Prevention Plan
 - c. Environmental regulatory requirements, including requirements related to Demolition.
 - d. Noise Plan
 - e. Commissioning Plan.
 - f. Other plans required by the Contract Documents
- D. Coordination of Activities: Coordinate activities included in various sections to assure efficient and orderly installation of each component. Coordinate operations included under different sections

that are dependent on each other for proper installation and operation. Coordinate pre-functional tests and startup testing with District and per the Contract Documents.

- E. Attendees: As a minimum, the Contractor's personnel required to attend include an officer of the firm, the Project Manager, Project Superintendent, QA/QC Manager, Alternate QA/QC Manager, A/E, and subcontractor representatives. Minutes of the meeting will be prepared by the QA/QC Manager and signed by the Contractor and the District. Provide a copy of the signed minutes to all parties.
- F. Agenda Items Include:
 1. Review of the Contract Documents to verify that requirements related to systems commissioning are adequately specified, and that each commissioned system is likely to meet the design intent relative to functionality, energy performance, water performance, maintainability, sustainability, system cost, indoor environmental quality, and local environmental impacts.
 2. Procedures for submission, review and approval of submittals are also described in Section 01 33 00 SUBMITTAL PROCEDURES.
 3. Review of sampling and testing procedures required under this Contract.

1.17 QUALITY CONTROL: LABORATORY, TESTS, AND REPORTING REQUIREMENTS

- A. Construction materials testing laboratories must be accredited by a laboratory accreditation authority and will be required to submit a copy of the Certificate of Accreditation and Scope of Accreditation.
 1. The laboratory's scope of accreditation must include the appropriate ASTM standards (E 329, C 1077, D 3666, D 3740, A 880, E 543) listed in the technical sections of the specifications.
- B. Laboratories engaged in Hazardous Materials Testing shall meet the requirements of OSHA and EPA. The policy applies to the specific laboratory performing the actual testing, not just the Corporate Office.
- C. Laboratory Accreditation Authorities: Laboratory Accreditation Authorities include the National Voluntary Laboratory Accreditation Program (NVLAP) administered by the National Institute of Standards and Technology at: <http://ts.nist.gov/ts/htdocs/210/214/214.htm> the American Association of State Highway and Transportation Officials (AASHTO) program at <http://www.transportation.org/aashto/home.nsf/frontpage>, International Accreditation Services, Inc. (IAS) at <http://www.iasonline.org>, the American Association for Laboratory Accreditation (A2LA) program at <http://www.a2la.org/>.
- D. Capability Check: The District retains the right to check laboratory equipment in the proposed laboratory and the laboratory technician's testing procedures, techniques, and other items pertinent to testing, for compliance with the standards set forth in this Contract.
- E. Test Results: Reference applicable Contract requirements, tests or analytical procedures used. Provide actual results and include a statement that the item test or analyzed conforms or fails to conform to specified requirements.
 1. If the item fails to conform, notify the District immediately. Conspicuously stamp the cover sheet for each report in large red letters "CONFORMS" or "DOES NOT CONFORM" to the specification requirements, whichever is applicable.

2. Test results must be signed by a testing laboratory representative authorized to sign certified test reports.
3. Furnish the signed reports, certifications, and other documentation to the District via the QA/QC Manager.
4. Furnish the signed reports, certifications, and a summary report of field tests at the end of each month to the District. Attach a copy of the summary report to the last daily Contractor Quality Control Report of each month.

1.18 QC CERTIFICATIONS AND DOCUMENTATION

- A. CQC Report Certification. Contain the following statement within the CQC Report:

"On behalf of the Contractor, I certify that this report is complete and correct and equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge, except as noted in this report."
- B. Invoice Certification. Furnish a certificate to the District with each payment request, signed by the QA/QC Manager, attesting that as-built drawings are current and, coordinated, and attesting that the work for which payment is requested, including stored material, is in compliance with Contract requirements.
- C. Documentation: Maintain current and complete records of on-site and off-site QC program operations and activities.
- D. Construction Documentation: Reports are required for each day that work is performed and must be attached to the Contractor Quality Control (CQC) Report prepared for the same day.
 1. Maintain current and complete records of on-site and off-site QC program operations and activities on the required forms.
 2. Reports are required for each day work is performed.
 3. Account for each calendar day throughout the life of the Contract.
 4. Every space on the forms must be filled in. Use N/A if nothing can be reported in one of the spaces.
 5. The Project Superintendent and the QA/QC Manager must prepare and sign the Contractor Production and CQC Reports, respectively.
 6. The reporting of work must be identified by terminology consistent with the Master CPM Schedule.
 7. In the "remarks" sections of the reports, enter pertinent information including directions received, problems encountered during construction, Work progress and delays, conflicts or errors in the drawings or specifications, field changes, safety hazards encountered, instructions given and corrective actions taken, delays encountered and a record of visitors to the work site, quality control problem areas, deviations from the QC Plan, construction deficiencies encountered, meetings held.
 8. For each entry in the report(s), identify the Schedule Activity No. that is associated with the entered remark.

- E. Quality Control Validation. Establish and maintain the following in a series of three ring binders. Binders shall be divided and tabbed as shown below. These binders must be readily available to the District during all business hours.
 - 1. All completed Preparatory Phase Checklists, arranged by specification section.
 - 2. All milestone inspections, arranged by Activity Number.
 - 3. An up-to-date copy of the Testing Plan and Log with supporting field test reports, arranged by specification section.
 - 4. Copies of all contract modifications, arranged in numerical order. Also include documentation that modified work was accomplished.
 - 5. An up-to-date copy of the Rework Items List.
 - 6. Maintain up-to-date copies of all punch lists issued by the QC staff to the Contractor and Sub-Contractors and all punch lists issued by the District.
 - 7. Commissioning documentation including checklists, schedules, tests, and reports.
- F. Testing Plan and Log:
 - 1. As tests are performed, the QA/QC Manager will record on the "Testing Plan and Log" the date the test was performed and the date the test results were forwarded to the District.
 - 2. Attach a copy of the updated "Testing Plan and Log" to the last daily CQC Report of each month.
- G. Rework Items List: The QA/QC Manager must maintain a list of work that does not comply with the Contract, identifying what items need to be reworked, the date the item was originally discovered, the date the item will be corrected by, and the date the item was corrected. There is no requirement to report a rework item that is corrected the same day it is discovered.
 - 1. The Contractor is responsible for including rework items identified by the District or its representative.
- H. As-Built Drawings: The QA/QC Manager is required to ensure the as-built drawings, required by Section 01 78 39 Project Record Documents, are kept current on a daily basis and marked to show deviations which have been made from the Contract Drawings. Ensure each deviation has been identified with the appropriate modifying documentation (e.g. PCO No., CO No., Request for Information No., etc.). The QA/QC Manager must initial each revision.
 - 1. Upon Substantial Completion of Work, the QA/QC Manager will furnish a certificate attesting to the accuracy of the as-built drawings prior to submission to the District.

1.19 NOTIFICATION ON NON-COMPLIANCE

- A. The District will notify the Contractor of any detected non-compliance with the Contract. Take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor at the work site, shall be deemed sufficient for the purpose of notification. If the Contractor fails or refuses to comply promptly, the District may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to such stop orders will be made the subject of claim for extension of time for excess costs or damages by the Contractor.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify existing site conditions and substrate surfaces are acceptable for subsequent Work. Beginning new Work constitutes acceptance of existing conditions by the Contractor.
- B. Verify existing substrate is capable of structural support or attachment of new Work being applied or attached.
- C. Examine and verify specific conditions described in individual specification sections.
- D. Verify utility services are available, of correct characteristics, and in correct locations.

3.2 TEST AND INSPECTION LOG

- A. Prepare a record of tests and inspections. Include the following:
 - 1. Date test or inspection was conducted.
 - 2. Description of the Work tested or inspected.
 - 3. Date test or inspection results were transmitted to District and Architect.
 - 4. Identification of testing agency or special Inspector conducting test or inspection.
- B. Maintain test and inspection log at project site. Post changes and modifications as they occur. Provide access to test and inspection log for District or its representative's reference during normal working hours.

3.3 PREPARATION

- A. Clean substrate surfaces prior to applying next material or substance.
- B. Seal cracks or openings of substrate prior to applying next material or substance.
- C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying new material or substance in contact or bond.

3.4 PREPARATION AND PROTECTION

- A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes. See also Section 01 73 29, Cutting and Patching.
- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

NEW SUBCONTRACTOR CHECKLIST		PREPARATORY PHASE		SPEC SECTION(S)	DATE
(CONTINUED ON SECOND PAGE)					
PROJECT NO.		SUBCONTRACTOR:		SCHEDULE ACTIVITY NO.	CONTRACT NO.
PERSONNEL PRESENT	DISTRICT REP NOTIFIED _____ HOURS IN ADVANCE:		YES <input type="checkbox"/>		NO <input type="checkbox"/>
	NAME	POSITION	COMPANY/DISTRICT		
SUBMITTALS	REVIEW SUBMITTALS AND/OR SUBMITTAL REGISTER. HAVE ALL SUBMITTALS BEEN APPROVED? YES <input type="checkbox"/> NO <input type="checkbox"/>				
	IF NO, WHAT ITEMS HAVE NOT BEEN SUBMITTED? _____				
	ARE ALL MATERIALS ON HAND? YES <input type="checkbox"/> NO <input type="checkbox"/>				
IF NO, WHAT ITEMS ARE MISSING? _____					
CHECK APPROVED SUBMITTALS AGAINST DELIVERED MATERIAL. (THIS SHOULD BE DONE AS MATERIAL ARRIVES.)					
COMMENTS: _____					
MATERIAL STORAGE	ARE MATERIALS STORED PROPERLY? YES <input type="checkbox"/> NO <input type="checkbox"/>				
	IF NO, WHAT ACTION IS TAKEN? _____				
SPECIFICATIONS	REVIEW EACH PARAGRAPH OF SPECIFICATIONS. _____				
	DISCUSS PROCEDURE FOR ACCOMPLISHING THE WORK. _____				
CLARIFY ANY DIFFERENCES. _____					

PRELIMINARY WORK & PERMITS	ENSURE PRELIMINARY WORK IS CORRECT AND PERMITS ARE ON FILE. IF NOT, WHAT ACTION IS TAKEN? _____ _____ _____ _____			
TESTING	IDENTIFY TEST TO BE PERFORMED, FREQUENCY, AND BY WHOM. _____ _____ _____ WHEN REQUIRED? _____ _____ WHERE REQUIRED? _____ _____ _____ REVIEW TESTING PLAN. _____ _____ _____ HAVE TEST FACILITIES BEEN APPROVED? _____ _____			
SAFETY	ACTIVITY HAZARD REVIEW CONDUCTED? YES <input type="checkbox"/> NO <input type="checkbox"/> REVIEW APPLICABLE PORTION OF SAFETY PLAN. _____ _____ _____			
MEETING COMMENTS	DISTRICT COMMENTS DURING MEETING. _____ _____ _____ _____			
OTHER ITEMS OR REMARKS	OTHER ITEMS OR REMARKS: _____ _____ _____ _____ _____ _____			
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%; text-align: center; padding: 2px;">SITE SUPERINTENDENT</td> <td style="width: 20%; text-align: center; padding: 2px;">DATE</td> <td style="width: 20%;"></td> </tr> </table>		SITE SUPERINTENDENT	DATE	
SITE SUPERINTENDENT	DATE			

END OF SECTION 01 45 00

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**SECTION 01 45 29
TESTING LABORATORY SERVICES**

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. All Contract Documents shall be reviewed for applicable provisions related to the provisions in this document, and provisions in the General Conditions and other Division 1 Specification Sections shall apply to this Section without limitation.

1.2 RELATED REQUIREMENTS SPECIFIED IN OTHER SECTIONS

- A. Section 01 11 00 – “Summary of Work”
- B. Section 01 45 00 – “Quality Control Requirements”
- C. Section 01 41 00 – “Regulatory Requirements”
- D. Section 01 66 13 – “Product Storage and Handling Requirements for Hazardous Material”
- E. Section 01 77 00 – “Closeout Procedures”
- F. Division 2 through 41 Sections for Special Inspections, tests required and standard for testing.

1.3 SUMMARY

- A. This section describes the requirements and procedures for work involving the testing laboratory.

1.4 REFERENCES

- A. CBC - California Building Code.
- B. CCR - California Code of Regulations.
- C. ANSI/ASTM D3740 – Practice for Evaluation of agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.
- D. ANSI/ASTM E329 – Standard Recommended Practice for Inspection and Testing Agencies for Concrete, Steel and Bituminous Materials as Used in Construction.

1.5 REGULATORY REQUIREMENTS

- A. Testing, sampling and preparing samples will be in accordance with the standards referenced in individual specification sections and in the applicable sections of CBC State Chapters.
- B. Testing and submitting test reports will conform to provisions of Section 4-335, Part 1, Title 24, CCR.
- C. Comply with Requirements of ANSI/ASTM E329 and ANSI/ASTM D3740.
- D. Laboratory shall maintain a full-time registered Engineer on staff to review services.
- E. Laboratory authorized to operate in State in which Project is located.
- F. Testing Equipment shall be calibrated at reasonable intervals with devices of accuracy traceable to either NSB Standards or accepted values of natural physical constants.

1.6 SELECTION AND PAYMENT

- A. The District will employ and pay for the services of testing laboratory and/or testing agencies acceptable to the Division of the State Architect to conduct required tests and inspections for the Project.

1. Soils: The testing laboratory will observe excavating, grading, and filling operations and provide testing of soil materials as required by the Division of the State Architect and as specified in the Contract Documents. The Soils Engineer will have management, laboratory and field supervisory personnel with minimum 5 years' experience in testing and inspection of soils materials and will have adequate facilities, equipment, and technical references to permit performance of testing and inspections within applicable regulations and standards in accordance with Section 4-335, Part 1, Title 24, CCR.
2. Other Construction: The testing laboratory will conduct tests, inspections, and special inspections as required by the Division of the State Architect and as specified in the Contract Documents.
 - a. Construction Requiring Testing and Inspection Other Than Special Inspection: The testing laboratory will have management, laboratory and field supervisory personnel with minimum 5 years' experience in testing and inspection of work and materials of construction and will have adequate facilities, equipment, and technical references to permit performance of testing and inspections within applicable regulations and standards in accordance with Section 4-335, Part 1, Title 24, CCR.
 - b. Construction Requiring Special Inspection: The testing laboratory will have special inspectors approved by the Division of the State Architect to conduct special inspections as required by the Division of the State Architect under provisions of Section 4-333, Part 1, Title 24, CCR.
- B. Retesting: When initial tests indicate non-compliance with the Contract Documents, subsequent retesting caused by the non-compliance shall be performed by the same testing agency and the costs thereof will be deducted by the District from the Contractor's Contract Price by Change Order.
- C. Retesting Covered Work: Re-examination of previously tested and inspected work may be ordered by the District. The Contractor shall uncover such work if retesting is ordered. If work is found in accordance with Contract Documents, the District will pay costs of uncovering, removing, retesting and replacing. If work is found not in accordance with Contract Documents, the District will deduct the cost of retesting from the Contract Price by Change Order and the Contractor will bear the costs of uncovering, removing and replacing work.
- D. Testing and inspecting performed for Contractor's convenience, such as testing and inspection to establish equivalence of substitutions, equivalence of repairs to damaged materials, and testing and inspecting to expedite the operations, shall be the Contractor's responsibility.
 1. The Contractor shall employ a licensed professional engineer of the discipline required to develop a testing program which will establish equivalency.
 2. The Contractor shall submit the testing program to the District for review.
 3. The Contractor shall arrange testing in accordance with the accepted testing program to be performed by the District's testing laboratory.
 4. The costs of testing done by the District's testing laboratory for the Contractor will be deducted from the Contract Price by Change Order.
 5. The Contractor may not arrange for testing upon portions of the work already completed except with the written consent of the District and Architect.

- E. Employment of testing laboratory shall in no way relieve Contractor of obligation to perform work in accordance with requirements of Contract Documents.
- F. The District shall have the right to make tests at any time on materials or work done whether those materials are specified or substituted items.

1.7 LABORATORY RESPONSIBILITIES

- A. Provide qualified personnel at site. Cooperate with District, Architect, Project Inspector and Contractor in performance of services.
- B. Perform specified sampling and testing of materials in accordance with specified standards.
- C. Ascertain compliance of materials and mixes with requirements of Contract Documents.
- D. Promptly notify Division of the State Architect, District, Project Inspector and Contractor of observed irregularities and non-conformance of work and products.
- E. Perform additional tests required by District, and Division of the State Architect.
- F. Attend Pre-Construction Meeting, Progress Meetings and other meetings as requested by District.
- G. Perform all tests required by the Division of the State Architect for this Project. See form DSA-103 in this Project Manual and individual specification sections.

1.8 LABORATORY REPORTS

- A. Test/Inspection Reports:
 - 1. Reports will comply with Section 4-335(d), Part 1, Title 24, CCR.
 - 2. Include every test and inspection made regardless of whether such tests and inspections indicate that the material and procedures are satisfactory or unsatisfactory.
 - 3. Include records of special sampling operations as required.
 - 4. Indicate that materials were sampled and tested in accordance with requirements of CCR regulations and Construction Documents.
 - 5. Indicate specified design strength of materials such as masonry, concrete and steel.
 - 6. State whether or not materials and procedures comply with requirements of the Contract Documents.
 - 7. Submit copies of reports to Division of the State Architect, District, Project Inspector, and Contractor within 14 days of tests. Submit copies of reports of non-complying materials and procedures immediately.
- B. Verified Reports:
 - 1. Soils Engineers inspecting placement of fills and Special Inspectors will submit Verified Reports in accordance with Section 4-336, Part I, Title 24, CCR.
 - a. Special inspections requiring Verified Reports include, but are not limited to, inspections of masonry construction, glued-laminated timber fabrication, wood framing using timber connectors, manufactured trusses, ready-mixed concrete batching, shotcrete application, shop welding and field welding.
 - b. Submit two copies of reports directly to the Office of Regulation Services; forward one copy each to District, Architect and Project Inspector.

2. Soils Engineers and testing laboratories conducting tests on materials will submit verification of test reports at completion of testing program and when required by Office of Regulation Services in accordance with Section 4-335(e), Part I, Title 24, CCR.
 - a. The Final Laboratory Verified Report or Laboratory Affidavit will indicate whether every material tested passed and disposition of problems associated with earlier deficient test reports.
 - b. Submit two copies of each report directly to Office of Regulation Services; forward one copy each to District and Project Inspector.

1.9 LIMITS ON AGENCY OR TESTING LABORATORY AUTHORITY

- A. Agency or laboratory may not release, revoke, alter or enlarge on requirements of Contract Documents.
- B. Agency or laboratory may not approve or accept any portion of the work.
- C. Agency or laboratory may not assume any duties of Contractor.
- D. Agency or laboratory has no authority to stop work.

1.10 CONTRACTOR RESPONSIBILITIES

- A. Package and deliver to laboratory at designated location adequate samples of materials proposed to be used which require testing. Samples shall be selected by laboratory personnel. Allow proper time for selecting samples, and making tests or considerations.
- B. Cooperate with laboratory personnel, and provide access to work and to manufacturer's facilities.
- C. Provide incidental labor and facilities to provide access to work to be tested, to obtain and handle samples as selected by laboratory personnel at the site or at source of products to be tested, to facilitate tests and inspections, and for storage and curing of test samples.
- D. Schedule all tests and inspections with the testing and inspections firm and to notify District and Project Inspector a minimum of 3 working days prior to expected time for operations requiring inspection and testing services. Do not allow work to be covered prior to inspection and testing.
- E. Cooperate fully with the testing laboratory's personnel and with special inspectors in inspecting any part of the construction and in taking any samples of materials required to be tested. Provide access to the work. The Contractor's personnel shall furnish and cut or prepare all samples in the presence of either the testing laboratory personnel or the special inspectors and secure the witness's initial on each sample prepared.
- F. Notify the testing laboratory to send a bonded messenger to pick up the initialed samples the same day the samples were prepared. Alert the testing laboratory 3 working days in advance as to the times and location of the required sampling, tests and inspections so as to not delay the work of the project, and make sure that the required sampling, tests inspections are promptly completed.

1.11 INSPECTIONS AND TESTS

Required inspections and tests may include, but are not limited to, the following:

- A. Testing Certificates to be provided by Contractor:

1. Mill test reports for reinforcing steel.
 2. Mill test reports for cement.
 3. Weighmaster's tickets for each load of transmit mixed concrete.
 4. Weighmaster's affidavit.
 5. Certifications of welders.
 6. Certifications of materials.
- B. Initial Testing Provided by District:
1. Site Clearing: Test compaction of excavation backfill.
 2. Earthwork:
 - a. Sample and test fill and base materials for compliance with specified requirements.
 - b. Inspect placement of engineered fill.
 - c. Inspect bottoms of footings and foundation trenches.
 - d. Test compaction of each layer of engineered fill.
 3. Trenching:
 - a. Inspect placement of trench backfill.
 - b. Test compaction of trench backfill.
 4. Asphaltic Concrete Paving:
 - a. Sample and test quality of paving and base if directed by District.
 - b. Test compaction of paving and base if directed by District.
 5. Portland Cement Concrete Paving:
 - a. Review mix designs.
 - b. Sample and test compressive strength of concrete.
 - c. Sample and test slump of concrete.
 6. Concrete Reinforcing:
 - a. Review mill tests.
 - b. Sample and test unidentified reinforcing steel.
 - c. Sample and test identified reinforcing steel.
 - d. Inspect placement and installation of reinforcing steel.
 - e. Inspect field welding of reinforcing steel.
 7. Cast-In-Place Concrete:
 - a. Sample and test cement.
 - b. Sample and test aggregate.
 - c. Review mix designs and confirm mix design proportions with weighmaster.
 - d. Perform initial batch plant inspection.
 - e. Inspect concrete placement.

- f. Sample and test slump of concrete.
 - g. Test air content of concrete.
 - h. Sample and test concrete for compressive strength.
 - i. Test concrete for shrinkage.
8. Structural Steel:
- a. Review mill certificates for shapes and plates.
 - b. Sample and test unidentified steel.
 - c. Establish recommended procedures for shop and field welding.
 - d. Inspect shop and field welding, including welded studs.
 - e. Test full penetration welds.
9. Metal Fabrications:
- a. Inspect shop and field welding of load bearing fabrications.
 - b. Test full penetration welds in load bearing fabrications.
10. Rough Carpentry: Load test expansion anchors.
11. **DSA 103 Form. See the DSA 103 form**
- C. The cost of the following initial tests, if required, will be deducted by the District from the Contract Price by Change Order.
- 1. Testing to establish equivalence of material not properly identified.
 - 2. Testing to establish equivalence of substitutions.
 - 3. Testing required to expedite Contractor's operations.
 - 4. Testing relating to repair of work which fails to meet specifications.
 - 5. Testing and inspection required to correct damage to material in shipping and erection.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION 01 45 29

SECTION 01 50 00
TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. All Contract Documents shall be reviewed for applicable provisions related to the provisions in this document, and provisions in the General Conditions and other Division 1 Specification Sections shall apply to this section without limitation.

1.2 RELATED REQUIREMENTS SPECIFIED IN OTHER SECTIONS

- A. Section 01 11 00 – “Summary of Work”
- B. Section 01 14 00 – “Work Restrictions”
- C. Section 01 31 00 – “Project Management and Coordination”
- D. Section 01 66 13 – “Product Storage & Handling Requirements for Hazardous Materials”
- E. Section 01 35 00 – “Special Procedures”
- F. Section 01 74 19 – “Construction Waste Management and Disposal”
- G. Section 01 57 23 – “Temporary Storm Water Pollution Prevention Control (SWPPP)”
- H. Section 01 74 00 – “Cleaning and Waste Management”
- I. Section 01 77 00 – “Contract Closeout Procedures”
- J. Divisions 2 through 41 Sections for specific requirements for Temporary Facilities and Controls for the Work in those Sections.

1.3 TEMPORARY FACILITIES AND CONTROLS PLAN

- A. Prior to the start of Work at the Site, Contractor shall provide full size drawings of site plan drawings illustrating the following:
 - 1. Locations and dimensions of temporary facilities including, but not limited to, all site trailers. Include floor plan layouts and pertinent details.
 - 2. Equipment and material storage areas.
 - 3. Pedestrian access paths and crossings,
 - 4. Location of way finding and other signage,
 - 5. Contractor haul routes and avenues of ingress/egress to and within the Campus.
 - 6. All fenced area and details of the fence installation.
 - 7. Identify any areas which may have to be paved or graveled to control dust or prevent tracking of mud.
 - 8. Other items including locations of safety and construction fences and/or barriers, construction entrances, trash dumpsters, temporary sanitary facilities, and worker parking areas.

- B. Contractor shall submit to District one (1) hard copy, and a PDF of the Temporary Facilities and Control Plans for review by the District.
- C. Contractor shall not perform any work at the Site until said site plan submitted by the Contractor has been accepted in writing by the District.
- D. Contractor can include this plan as part of the plan required by Section 01 14 00, Work Restrictions.

1.4 REQUIRED TEMPORARY FACILITIES AND CONTROLS

- A. Contractor shall provide and maintain all temporary facilities, utilities, and controls as required to perform the Work and as required herein. Materials, installation, and maintenance of temporary utilities and facilities shall be in compliance with all applicable local and State regulatory requirements. Remove temporary utilities and facilities, including associated materials and equipment, when no longer required. Restore and recondition existing facilities used during construction and areas of the Site, roads, driveways, parking lots, landscaping, and any other existing improvements either damaged or disturbed by the installation of temporary facilities or utilities to their original condition. Remove and properly dispose of debris resulting from removal and reconditioning operations.
- B. Contractor shall furnish and install requirements for temporary utilities, facilities, security, and protection which include but are not limited to the following:

1. Temporary Electric Power and Lighting

- a. The College has limited power available for temporary offices. Power for construction activities shall be provided by the Contractor.
- b. The installation and removal of all temporary distributions of power throughout the Site shall be the sole responsibility of the Contractor without adjustment to the Contract Price or the Contract Time. The Contract Price shall not be adjusted on account of any disruption, reduction or elimination of electrical power service to the Site. Contractor shall provide power outlets for construction operations, with branch wiring and distribution boxes located as required to complete the Work.
- c. Contractor shall provide and maintain electrical power at the Site for construction purposes, for temporary facilities and trailers, and for any other site offices or trailers required by the Contract Documents. Contractor shall provide all necessary wiring and appurtenances.
- d. Contractor shall provide and maintain distribution of temporary electrical power and lighting to the Work and for use by the District project manager and project inspector.
- e. Contractor shall provide temporary power main service disconnect and over current protection at convenient locations and as required by governing codes.
- f. The Contractor shall be responsible for providing temporary facilities as required to deliver power service from the point of connection to the point(s) of intended use.
- g. The Contractor shall provide, install, and maintain temporary electrical lighting wherever necessary to provide illumination for the proper performance and/or observation of the Work. Where required, a minimum of 20 foot-candles for rough work and 50 foot-candles for finish work shall be provided.

- h. Existing Temporary LED Lighting: In addition to maintaining existing exterior light poles and lighting during the construction duration, the Contractor shall maintain in good condition the existing temporary LED lighting installed approximately every eight feet along the temporary fencing on 2"x4" wood posts secured to the temporary fencing adjacent to pedestrian paths of travel on the west, east, and north sides of the project site. Contractor shall replace any lighting that may burn out or damaged by Contractor during the contract duration. Contractor is responsible for removing all of the temporary lighting after Substantial Completion and when existing permanent lighting is in place.

2. Temporary Communications/Telephone

- a. Contractor shall provide, maintain, and pay for all required communications and data services (including without limitation telephone, e-mail and internet) to all Project field offices to include a multi-function printer, copier, scanner, fax unit commencing at the time of Project mobilization, including all installation, connection, and monthly charges. The installation and removal of all temporary telephone and data distribution shall be the sole responsibility of the Contractor without adjustment of the Contract Price or the Contract Time.
- b. Contractor shall provide, maintain, pay for telephone and data/internet service to field offices at time of project mobilization and for the duration of the project. Contractor to pay costs for telephone installation, telephones, internet access, maintenance services and removal.
- c. Contractor to provide a list of important telephone numbers at each telephone on the site offices including, but not limited to the following:
 - i) Police and Fire Departments
 - ii) Campus Police Services
 - iii) Ambulance Service
 - iv) Contractor's home office
 - v) All Principal Subcontractors' field and home offices
 - vi) Architect's office
 - vii) Engineer's office
 - viii) District office
 - ix) Project Manager and Construction Manager
 - x) Project Inspector of Record
 - xi) Campus Building & Grounds Department
 - xii) Testing Laboratory
- d. Provide Contractor's superintendent with cellular telephone for use when away from field office.

3. Temporary Water

- a. Not used.

- b. Contractor shall be allowed to utilize water from the District for domestic use only. Water shall not be provided nor used for dust control, street cleaning, cleaning tools, soil compaction, or vehicle washing. Water used for such purposes shall be provided by the Contractor at its expense.
- c. Contractor shall provide and maintain necessary temporary water supply connections, pipes, hoses, nozzles, and fittings required. Before final acceptance, all temporary water supply components installed by Contractor shall be removed in a manner approved by District’s Representative.
- d. Unnecessary waste of water will not be permitted. Special hydrant wrenches shall be used for opening and closing fire hydrants, in no case shall pipe wrenches be used for this purpose. Contractor shall obtain written approval and pay all required fees of governing agencies having jurisdiction (e.g., HBMWD and Humboldt County Fire Protection District) prior to using any fire hydrant water on or off Redwoods Community College District property.
- e. Contractor shall provide and use backflow preventers on water lines at point of connection to any District water supply. Backflow preventers shall comply with requirements of California Uniform Plumbing Code. The installation and removal of all temporary backflow preventers on the Site shall be the sole responsibility of the Contractor without any adjustment to either the Contract Sum or the Contract Time. Before final acceptance, all temporary connections and piping installed by Contractor shall be removed in a manner approved by District’s Representative.
- f. Contractor shall provide and make potable water available for human consumption. Contractor shall provide and maintain suitable quality water service required for construction operations.

4. Temporary Fences

- a. Temporary Fencing: Contractor shall provide temporary fencing around specified construction areas for safety and protection. Provide chain link fencing not less than six (6) feet in height, complete with metal posts and required bracing, anchorage, visual screening (green fabric), and with truck and pedestrian gates. All vehicle and Pedestrian gates and openings shall have gates secured after hours of operation.
- b. Contractor shall provide padlocks used for securing all gates. Padlocks shall be designed to prohibit cutting of shackle. Contractor shall coordinate keying strategy with District and Humboldt County Fire Protection District
- c. Contractor shall be responsible for locking gates and shall be secured with minimum 3/8-inch-thick, 30 grade coil chain, minimum 5/16-inch cable. Gates shall be kept closed and locked at all times when not in use.

All existing fences affected by the Work shall be maintained by Contractor until Final Completion of Project. Fences which interfere with construction operations shall not be relocated or dismantled until District gives written permission to do so, and the timing of fence relocation or dismantling has been agreed upon. Where fences must be maintained across the construction easement, adequate gates shall be installed. Site Enclosure Fence: Contractor shall furnish and install site enclosure fence in a

manner that will prevent people and animals from easily entering site except by entrance gate.

- d. Contractor will be responsible for maintaining security by limiting number of keys and restricting distribution to authorized personnel.
- e. Security Enclosure and Lockup: Install substantial temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft and similar violation of security.
- f. Contractor shall provide secure lockup for stored materials and equipment which are of value or attractive for theft.
- g. Contractor shall be responsible for project security for materials, tools, equipment, supplies and completed and partially completed Work.
- h. On completion of the Work across any tract of land, Contractor shall restore all fences to their original or to a better condition, and to their original locations.
- i. Lease Period: N/A

5. Temporary Protection of Public and Private Property

- a. Contractor shall protect, shore, brace, support and maintain all existing underground utilities including but not limited to the following: all pipes, conduits, drains and other underground construction uncovered or otherwise affected by construction operations.
- b. All pavement, surfacing, driveways, curbs, walks, buildings, utility poles, guy wires, fences and other surfaces structures affected by construction operations, together with all sod and shrubs in yards, planting areas, and medians, shall be restored to their original condition, wherever affected by construction operations. All replacements shall be made with new materials.
- c. Contractor shall be responsible for all damage to streets, roads, highways, shoulders, ditches, embankments, culverts, bridges and other public or private property, regardless of location or character, which may be caused by transporting equipment, materials, or workers to or from the Work, Site or any part thereof, whether by Contractor or Subcontractors. Contractor shall be solely responsible without adjustment of the Contract Price or the Contract Time to make satisfactory and acceptable arrangements with the District, or the agency or authority having jurisdiction over the damaged property, concerning its repair or replacement or payment of costs incurred in connection with the damage.
- d. All fire hydrants and water control valves shall always be kept free from obstruction and available for use.

6. Temporary Sanitary Facilities

- a. Contractor shall provide and maintain temporary sanitary toilets for use of all workers throughout the course of the Work. At a minimum, sanitary facilities shall be located at the trailer site, Contractor staging area(s) and adjacent to Work areas.

- b. Sanitary facilities shall be of reasonable capacity, properly maintained throughout the Project, and obscured from public view to the greatest practical extent. If toilets of the chemically treated type are used, at least (1) toilet will be furnished for each (15) persons. Contractor shall enforce the use of such sanitary facilities by all personnel at the Site.
 - c. Contractor shall comply with all minimum requirements of the Humboldt County Health Department or other public agency having jurisdiction.
 - d. Maintain temporary facilities in a sanitary condition at all times during the Project.
 - e. Contractor will keep sanitary facilities free from graffiti.
 - f. Use of toilet facilities installed as part of the Work shall not be permitted.
 - g. All Portable toilets shall be located within fenced areas of the Site.
 - h. Contractor shall be responsible for providing access to the temporary toilet facilities.
- 7. Temporary Barriers and Enclosures**
- a. Contractor shall provide barriers to prevent unauthorized entry to construction areas, to allow for District's use of the Site, and to protect existing facilities and adjacent improvements from damage during construction operations.
 - b. Contractor shall provide barricades as required by the Contract Documents, governing agencies, and/or field conditions in order to protect public access pathways to existing buildings scheduled to remain open during any part of the Work
 - c. Contractor shall protect vehicular traffic, stored materials, Site, and existing structures from damage.
 - d. Contractor shall provide and maintain temporary enclosures to prevent public entry to any construction area, and to protect all persons using other existing buildings and portions of the Site and/or premises Contractor shall maintain safe access to all existing facilities to remain in operation during any part of the Work.
- 8. Temporary Water Control**
- a. Contractor shall comply with Section 01 57 23 (Storm Water Pollution Prevention Plan.)
- 9. Temporary Pollution Control**
- a. Contractor shall prevent the pollution of drains and watercourses by sanitary waste, sediment, debris and other substances resulting from construction activities. See Section 01 57 23 and the other Contract Documents for additional information and requirements.
 - b. No sanitary wastes shall be permitted to enter any drain or watercourses other than sanitary sewers. No sediment, debris or other substance shall be permitted to enter sanitary sewers without authorization of the receiving sanitary sewer service and all possible Best Management Practices (BMPs) shall be taken to prevent such materials from entering any drain to watercourse. Rate of discharge for storm water may be not increased by the Project during or following construction.
 - c. In the event that dewatering of excavations is required, Contractor shall obtain the necessary approval and permits for discharge of the dewatering effluent from the local

jurisdiction. Contractor shall be responsible for assuring that water quality of such discharge meets the appropriate permit requirements prior to any discharge.

- d. Contractor shall comply with the District Storm Water Pollution Prevention Plan for this Project.

10. Construction Aids

- a. Contractor shall furnish, install, maintain and operate all construction aids as required for the performance of the Work. Such construction aids include, but are not limited to, elevators and hoists, cranes, temporary enclosures, swing staging, scaffolding, and temporary stairs.

11. Erosion Control

- a. Contractor shall comply with the Storm Water Pollution Prevention Plan for all Work on this Project including Work under this Specification Section. See Section 01 57 23 and the other Contract Documents for additional information.
- b. Contractor shall prevent soil erosion on the Site and adjacent property resulting from its construction activities to the maximum extent practical, including implementation of Best Management practices. Effective measures shall be initiated prior to the commencement of clearing, grading, excavation or other operations that will disturb the natural protection.
- c. Work shall be scheduled to expose areas subject to erosion for the shortest possible time and natural vegetation shall be preserved to the greatest extent practicable. Temporary storage, temporary construction buildings and temporary Field office buildings shall be located and construction traffic routed to minimize erosion. Contractor shall provide temporary fast-growing vegetation or other suitable ground cover shall be provided as necessary to control runoff.

12. Vehicular and Pedestrian Traffic Controls

- a. The Campus is an active site, with vehicular and pedestrian traffic occurring at all times of the day and all days of the week. Contractors shall coordinate with District's Representative concerning vehicular traffic associated with the construction to minimize disruption to campus operations. Delivery trucks and large equipment shall enter the Contractors access gate and shall use the route mutually agreed upon between District and Contractor. Contractor shall provide signage directing construction and delivery traffic to this gate. Contractor shall provide information regarding sign types, size, material, text and locations to be reviewed and approved by the District Representative, and the Campus prior to installation. See Article 12 below for additional requirements, and Section 01 14 00, Work Restrictions for additional requirements for vehicular access, traffic control and related restrictions and requirements.
- b. Contractor shall always keep all required Fire District and emergency vehicle access paths free from obstruction during the Project. See Architectural Drawings for the location of the existing fire road. The Humboldt Bay Fire Protection District always requires unobstructed access along this road and will require keys to the Contractor's temporary fence gates. The Contractor will not be allowed to park vehicles along the

fire lane, nor be allowed to store any materials or equipment that obstructs the path of travel by the Fire District, unless approved in writing by both the Fire District and the District.

- c. Areas where the construction zone and Campus Activity converge, the Contractor shall include automatic flashing safety warning signs, pedestrian crosswalk striping and signage to provide a safe path of travel. Contractor shall also provide a flag person, at all times, truck traffic is entering or exiting the construction zone. Contractor shall provide a plan for review and approval by the District. Contractor shall anticipate, and include in their bid, curb cuts, regrading driveways and walkways in some areas to accommodate pedestrian and vehicular traffic, including Contractor's ingress and egress to the Site.
- d. Contractor shall not allow any construction personnel parking or other related equipment parking on County Roads. County Roads shall not be used for material storage or laydown areas unless the Contractor obtains encroachment permits from the County.

13. Trees and Plant Protection

- a. Contractor shall preserve and protect existing trees and plants on the Site that are not designated or required to be removed and those adjacent to the Site. See other Contract Documents for additional information and requirements.

14. Dust Control

- a. Contractor shall conduct all construction operations to minimize the generation of dust and dirt and prevent dust and dirt from interfering with the progress of the Work and from accumulating in the Work and adjacent areas including, without limitation, occupied facilities and neighboring communities. See other Contract Documents for additional information and requirements.

15. Temporary Signage

- a. See Section 01 14 00, Work Restrictions, Drawing and other Contract Documents for additional information and requirements for temporary signage.
- b. Sign must be reviewed and approved by the District and the Campus prior to installation. Contractor shall use an experienced sign company to produce all temporary signs. Install signs where indicated in Contract Documents, and/or as required by the District. Unauthorized signs are not permitted.
- c. Contractor shall provide temporary directional way-finding signs around the Project site to guide faculty, students, and visitors to safely navigate around construction activities at the Project site and to warn faculty, students, and visitors of potential safety hazards. Contractor shall provide an additional **4** wayfinding signs to match existing at the Project Site, or on fencing or other structures as approved by the District. A sample way-finding sign is attached at the end of this section that provides basic dimensions, materials, backgrounds and related information. However, final proposed signs by Contractor shall be reviewed and approved by the District and Campus prior to fabrication and installation.
- d. In addition too way-finding signs, additional safety sign types shall include, but not be limited to: Danger/Construction Area/No Trespassing; Caution/Demolition Work in

Progress; Do Not Enter/Authorized Personnel Only; Warning/Hard Hat Required Beyond this Point; Eye Protection Required Beyond this Point; Danger/Flammable Materials/ No Smoking Within 25 Feet; Danger/Keep Gate Closed; Caution/Laser Operation in Use; Caution/Overhead Work in Progress; Power Actuated Tools in Use; All Visitors Report to Job Trailer; Eye Wash Station; Authorized Access Only; Danger/No Trespassing; Caution/Construction Traffic; Caution/Pedestrian Traffic; Building Closed, and Contractor Deliveries. All signs shall be in both English and Spanish; and shall be in a quantity required and applicable as approved by the District. A sample safety sign type is attached at the end of this section for general guidance, but final proposed signs by Contractor shall be reviewed and approved by the District and Campus prior to fabrication and installation.

- e. Contractor shall maintain and touch-up signs, so they are always legible.

16. Temporary Heat, Ventilation and Lighting

- a. Provide temporary heat as required to maintain adequate environmental conditions to facilitate progress of the work, to meet specified minimum environmental conditions for the Work and to protect materials and finishes from damage due to improper temperature and humidity conditions.
- b. Portable heaters shall be standard units complete with controls, appropriate safety features, and bear testing lab approval markings.
- c. Provide adequate forced ventilation of enclosed areas as required for proper installation and curing of materials, to disperse humidity, and to prevent hazardous accumulations of dust, fumes, vapors and gases.
- d. HVAC Equipment: Unless District authorizes use of permanent HVAC system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.
 - i) Use of gasoline-burning space heater, open-flame heater or salamander-type heating units is prohibited.
 - ii) Heating Units: Listed and labeled for type of fuel being consumed, by a testing agency acceptable to authorities having jurisdiction and marked for intended use.

PART 2 – PRODUCTS

2.1 TEMPORARY FACILITIES/TEMPORARY FIELD OFFICE

- A. Contractor shall provide Temporary Field Offices: Prefabricated or mobile units with serviceable finishes, heating and air conditioning systems, temperature controls, and foundations adequate for normal loading. Contractor is responsible for all related permitting, transportation and removal.
- B. IOR Field Office Building: Size 12’ wide x 20’ long, nominal, to accommodate needs of IOR employed by District . Furnish and equip offices as follows:
 - 1. Two 4-drawer vertical file cabinets
 - 2. One plan tables capable of holding full size plans fully open
 - 3. Plan racks sufficient to hold all project and shop drawings.

4. Two 5' long desks with drawers
5. Two side tables for desks
6. Two adjustable, swivel office chairs on casters
7. Two 3'-wide 4-shelf book shelving units
8. One 4' x 5' white board
9. Two telephone lines (at desks)
10. Internet connection at each desk
11. One color copier/scanner/fax machine, capable of producing at least 24 prints per minute, that will accommodate 8.5' x 11", 8.5" x 14", and 11" x 17" paper. Contractor to provide maintenance, ink and paper supplies. This machine will be for use by District Representative for this project only. Copier/scanner/fax machine will become the District's property at project completion.
12. Two wastebaskets.
13. One trash can with lid outside the trailer. Trash to be emptied by Contractor as needed.

2.2 EQUIPMENT

- A. Fire Extinguishers: Contractor shall provide portable, UL-rated; with class and extinguishing agent as required by locations and classes of fire exposures according to NFPA 10.
- B. First Aid Supplies: In compliance with governing regulations.

2.3 MATERIALS

Not used

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Locate facilities where they will serve the Project adequately and result in minimum interference with performance of Work. Relocate and modify facilities as required by progress of the Work during entire project including all phases of project.
- B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.
- C. Contractor shall verify and coordinate all relocation of facilities with the District Representative.

3.2 OPERATION, TERMINATION AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal.
 1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
- C. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion and acceptance by the District.

- D. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use a permanent facility or no later than Final Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces and replace construction that cannot be satisfactorily repaired.
17. Materials and facilities that constitute temporary facilities are property of Contractor. District reserves the right to take possession of Project Identification signs at no cost to the District.
 18. Remove temporary paving not intended for or acceptable for integration into permanent paving. Where area is intended for landscape development, remove soil and aggregate fill that do not comply with requirements for fill or subsoil. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that might impair growth of plant materials or lawns. Repair or replace street paving, curbs and sidewalks at temporary entrances, as required by authorities having jurisdiction.
 19. Clean and renovate permanent facilities used during construction period prior to Final Completion. Comply with final cleaning requirements specified in Section 01 77 00, Closeout Procedures.

END OF SECTION 01 50 00

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SECTION 01 57 23
TEMPORARY STORM WATER POLLUTION CONTROL
STORM WATER POLLUTION PREVENTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. All Contract Documents shall be reviewed for applicable provisions related to the provisions in this document, and provisions in the General Conditions and other Division 1 Specification Sections shall apply to this Section without limitation.

1.2 RELATED DOCUMENTS SPECIFIED IN OTHER SECTIONS

- A. Section 01 11 00 – “Summary of Work”
- B. Section 01 71 23 – “Field Engineering”
- C. Section 01 33 00 – “Submittal Procedures”
- D. Section 01 41 00 – “Regulatory Requirements”
- E. Section 00 72 00 - General Conditions Article 13.12, Storm Water Pollution Prevention
- F. Divisions 2 through 41 Sections for Storm Water Prevention Plan requirements for the work in those sections.

1.3 BACKGROUND

- A. Storm drains discharge directly to creeks and the Bay without treatment. Discharge of pollutants (any substance, material, or waste other than uncontaminated storm water) from this project into the storm drain system is strictly prohibited by the State Water Resources Control Board (SWRCB) Order 2009-0009 DWQ (Order) and California Regional Water Quality Control Board (RWQCB) and the North Coast Regional Water Quality Control Board.
- B. This specification is applicable to this Project since it will disturb (e.g., digging, trenching, grading, clearing, filling) one or more acres of land surface. Contractor shall calculate and confirm the disturbed soil acreage and submit calculations to the District.
- C. This specification also covers Linear Underground/Overhead Projects as regulated by the Order.
- D. Area of land surface disturbance includes but is not limited to:
 - 1. Clearing of the land both for access (i.e. access roads) to the site as well as preparing the site

- for constructing the project,
- 2. Constructing access roads to the Site,
- 3. Grading of the Site in total,
- 4. Equipment staging area, maintenance area, and construction easement if they occur atop a soil surface which has not been included in the calculation for area of soil disturbance,
- 5. Material and/or soil stockpiles if atop a soil surface (not if atop an impervious surface such as concrete or asphalt),
- 6. Area of asphalt or concrete pavement removal if it is removed entirely to the soil surface,
- 7. Area that is related to demolition and removal of existing structures if that demolition and removal is to the soil surface.
- 8. Concrete truck clean-out areas if atop a soil surface.

1.4 SUMMARY OF WORK

- A. Provide storm water pollution prevention plan as specified and as required by appropriate regulatory authorities, complete.
- B. Work In this section includes all labor, equipment, and materials necessary for the preparation, implementation, maintenance, and monitoring of the Storm Water Pollution Prevention Plan (SWPPP). Principal items of work included herein include, but are not limited to:
 - 1. Plan administration, maintenance, update, and termination.
 - 2. Placement of erosion/pollution control devices (where applicable).
 - 3. Maintenance and monitoring of control devices.
 - 4. Miscellaneous related work necessary for plan compliance.
 - 5. Reports and certificates.
 - 6. Monitoring and associated report (based on Risk Level).
- C. Work under all other sections of this specification shall comply with the requirements of this section. All trades working on the Project need to be aware of and in compliance with the SWPPP.
- D. All materials that can potentially enter and/or pollute storm water discharges and the generation of non-storm water discharges shall be in compliance with the SWPPP. Representative materials and procedures include erosion control of construction vehicles and equipment, and general construction debris potentially entering the storm drain system’s natural flow course.

1.5 REQUIREMENTS

- A. The State Water Resources Control Board uses the Storm Water Multiple Application and Report Tracking System (SMARTS) SMARTS web-based application for storm water permit processing and tracking. The Contractor shall input data and upload documents required for storm water permit compliance. The program is also responsible for processing, reviewing, updating, terminating Notices of Intent (NOIs), annual reports, and maintaining the billing status

of each discharger. SMARTS has been developed to provide an online tool to assist dischargers in submitting their NOIs, NECs, NOTs, and Annual Reports, as well as, viewing/printing Receipt Letters, monitoring the status of submitted documents, and viewing their application/renewal fee statements. The system will also allow the Regional Board and State Board staff to process and track the discharger submitted document is a user account and password protected system where a valid user account and password is needed to access the system. SMARTS is a user account and password protected system where a valid user account and password is needed to access the system. Prepare Permit Registration Documents according to the requirements found in this section. Electronically submit these documents to the District at least 15 working days prior to the land surface disturbance at the Site.

Once the documents are approved, the Contractor shall upload the required data and documents to the SMARTS web site.

- B. Provide a Qualified Storm-Water Pollution Prevention Plan (SWPPP) Developer (QSD) and a Qualified SWPPP Practitioner (QSP) for SWPPP development and implementation as defined in the Order ("Qualified" means the developer and/or practitioner possesses the necessary professional license, i.e. Professional Engineer, Geologist, etc. and has passed any exam(s) required to obtain the QSD/QSP certification. Refer to the specific requirements as shown within the SWRCB General Construction Permit and regulations). The QSD or QSP shall input and maintain data and documents in the SMARTS web site to ensure compliance with the state storm permit at all times.
- C. Provide all material, labor, equipment, for installation, implementation, and maintenance of all surface-water pollution prevention measures. This work includes the following:
 1. Furnishing, placing, and installing effective measures for preventing erosion and runoff of soil, silts, gravel, hazardous chemicals or other prohibited materials defined by the SWRCB and RWQCB.
 2. Managing on-site construction materials in such a manner as to prevent said materials from contacting storm water or wash water and running off-site into the storm drain system.
 3. Complying with applicable standards and regulations for water pollution and erosion control.
 4. Include post-construction storm water pollution prevention structures in the storm water pollution prevention plan. Contractor shall use construction drawings as the reference for post-construction BMPs.
- D. Contractor will not be required to maintain post-construction pollution prevention structures. However, Contractor is required to provide operations and maintenance documents to the District at the end of construction.
- E. In this section, the term "storm drain system" shall include storm water conduits, storm drain inlets and other storm drain structures, street gutters, channels, watercourses, creeks, ponds, lakes, and Humboldt Bay.
- F. Sanitary sewer discharge regulations are intended to provide protection of the sanitary sewer system and appropriate municipal utility water pollution control plant. In this specification, "sanitary sewer" shall include any sanitary sewer manhole, clean-out, side sewer or other connection to the area wastewater treatment plant.

- G. Contractor shall have storm drain pollution prevention measures in place and follow this specification anytime rain is predicted in the area by the National Oceanic and Atmospheric Administration (NOAA) prediction for rain at or above 50%. It is the responsibility of the Contractor to be prepared for a rain event at all times required by the Order, to be aware of weather predictions, and to perform actions triggered by prediction of such rain events. The District is not responsible for informing the Contractor of rain predictions. In the event the Project is determined to be a Risk Level two or higher project by the Contractor’s QSD/QSP, the Contractor must create a Rain Even Action Plan (REAP) anytime rain is predicted (50% or greater chance as mentioned above) within 48 hours. The QSP must implement the REAP and have it on-site no later than 24 hours prior to the rain event.
- H. Construction site sanitary sewer blockage will likely result in a back-up and overflow to the storm drain system. The Contractor shall immediately notify the District and the Project Inspector of record if there is a clogged sanitary sewer, and implement a plan to re-direct sewage if an overflow of the sanitary sewer will result in sewage discharge to the storm drain.
- I. Contractor shall not allow any non-storm water to enter the storm drain system. Non-storm water includes domestic supply water used to wash streets, painting and drywall equipment, tools, equipment, or vehicles. Except for certain fire-line flushing and testing procedures, contact the District for discharge approval.

1.6 REGULATIONS AND STANDARDS

- A. Contractor shall comply with the following applicable regulations:
 - 1. Clean Water Act, United States Environmental Protection Agency, and Porter-Cologne Clean Water Act, State of California.
 - 2. North Coast Regional Water Quality Control Board
 - 3. California State Water Resources Control Board NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) GENERAL PERMIT FOR STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION AND LAND DISTURBANCEACTIVITIES, Order 2009- 0009 DWQ (Order) and all Amendments.
- B. Contractor shall comply with industry-standard guidelines on storm drain pollution prevention, such as:
 - 1. 2009 CASQA Construction BMP Handbook, available electronically at the California Stormwater Quality Association (CASQA) interactive web portal.

1.7 SUBMITTALS/DELIVERABLES

- A. Prepare Permit Registration Documents (PRD) according to the requirements found in Attachment B of the Order. Submit these documents to the District electronically at least 20 working days prior to the soil disturbance at the Site. Some or all of the following documents may be required, depending on the site Risk calculation, monitoring requirements, construction phase storm water treatment systems, and post-construction storm water treatment structures:
 - 1. Storm Water Pollution Prevention Plan created by the Contractor’s QSD
 - 2. Site Map
 - 3. Post-construction water balance form
 - 4. Risk Calculation

5. Active Treatment Systems plans (based on Risk Level determined in PRD)
 6. Others as may be required by the State Water Resources Control Board Order 2009 0009 DWQ.
 7. Erosion control and water pollution control drawings based on actual construction phasing and staging locations. Contractor shall use construction drawings and requirements from the construction general permit as the reference for these drawings.
- B. The Notice of Intent (NOI) will be completed by the District following electronic upload of the approved documents to the SMARTS web site by the Contractor.
 - C. Monitoring Reports. Monitoring sampling results reports are mandated according to the Risk Level and specific characteristics of the Site as prescribed in the Order. Contractor shall determine the required monitoring reports according to the Order and submit a list of such documents to the District and the SMARTS database. When the Project is underway, the Contractor shall produce the mandated reports electronically and submit them to the District and SMARTS electronically within 2 days of the conclusion of the rain event, and within 1 day of Numeric Action Level exceedance.
 - D. Annual Reports. Contractor shall determine the required information according to the Order and electronically submit the Annual Report electronically to the District and the SWRCB via SMARTS database.
 - E. Notice of Termination. Contractor shall determine the required information according to the Order and electronically submit Notice of Termination documents to the District and the SWRCB via the SMARTS database.
 - F. Complete and provide the Post-Construction Water Balance Performance Standard Spreadsheet as found in Appendix 2/2.1 of the Order.

1.8 ENVIRONMENTAL ENFORCEMENT

- A. State, regional, and local agencies have authority to enforce, through codified regulations, any portions of this Section that if not implemented may violate applicable regulations. Agency enforcement may include but is not limited to: citations, orders to abate, bills for cleanup costs and administration, civil suits, and/or criminal charges. Contract compliance action by the District shall not be constructed to void or suspend any enforcement actions by these or other regulatory agencies.

PART 2 - MATERIALS

2.1 GENERAL

- A. Provide materials as required for execution of the Work required by the approved Stormwater Pollution Prevention Plan, prepared by the Contractor’s QSD

PART 3 - EXECUTION

3.1 GENERAL

- A. Report any hazardous or unknown material spills immediately to a District Representative. If a spill occurs after hours or on a weekend, contact the campus Police Department. The Contractor is responsible for ensuring that its employees and subcontractors (if any) working on site are aware of the location of the campus phone nearest the Site. The Contractor is also responsible for creating the necessary spill reports outlined in the construction general permit and must upload them to SMARTS.
- B. Adhere to the requirements of the Order.

3.2 SPILL PREVENTION AND CONTROL

- A. The Contractor shall keep spill cleanup materials, such as rags or absorbents, readily accessible on-site.
- B. The Contractor shall immediately contain and prevent leaks and spills from entering storm drains, and properly clean up and dispose of the waste and cleanup materials. If the waste is hazardous, the Contractor shall dispose of hazardous waste only at authorized and permitted Treatment, Storage, and Disposal Facilities, and use only licensed hazardous waste haulers to remove the waste off-site, unless quantities to be transported are below applicable threshold limits to transportation specified in State and Federal regulations.
- C. The Contractor shall not wash any spilled material into streets, gutters, storm drains, ponds, or creeks and shall not bury spilled hazardous materials.
- D. The Contractor shall report any hazardous materials spill to Emergency 911, and then the District.

3.3 DE-WATERING AND SEDIMENT MANAGEMENT AND NONHAZARDOUS MATERIAL/WASTE MANAGEMENT

- A. If storm water or groundwater in site excavations or drilled holes, (e.g., trenches, pits, pier holes, footings), needs to be removed, it shall be made clean by filtering, settling, or other method capable of removing solids and suspended particles from this water prior to discharge to the storm drain system. The Contractor shall ensure that this discharge complies with all applicable provisions of the Basin Plan.

- B. If excavation water is domestic supply water, or the water is contaminated with a hazardous substance, then the Contractor shall dispose of according to guidance from the District. For disposal authorization, the Contractor shall contact the District to determine the discharge requirement.
- C. If the Contractor suspects the presence of contaminated groundwater, or domestic supply water, the Contractor shall immediately notify the District. The Contractor shall not attempt to pump out or treat any material suspected of containing a hazardous material or petroleum product.
- D. Designated Area:
 1. The Contractor shall propose designated areas of the Site, for approval by the Engineer, suitable for material delivery, storage, and waste collection that, to the maximum extent practicable, are near construction entrances and away from catch basins, gutters, drainage courses, ponds, and creeks.
- E. Granular Material:
 1. The Contractor shall store granular material at least ten feet away from catch basin and curb returns.
 2. The Contractor shall not allow granular material to enter the storm drains, ponds, or creeks.
 3. When rain is forecast within 24 hours or during wet weather, the Engineer shall require the Contractor to cover granular material with a tarpaulin and to surround the material with sandbags
- F. Dust Control: The Contractor shall use reclaimed water if available to control dust on a daily basis or as directed by the QSP. If reclaimed water is not available, Contractor to use domestic water.

3.4 HAZARDOUS MATERIAL/WASTE MANAGEMENT

- A. Label all hazardous materials and hazardous wastes (such as pesticides, paints, thinners, solvents, fuel, oil, and antifreeze) in accordance with City, State and Federal regulations.
- B. Store hazardous materials and wastes in secondary containment and cover them during wet weather.
- C. Follow manufacturer's application instructions for hazardous materials and do not use more than necessary. Do not apply chemicals outdoors when rain is forecast within 24 hours.
- D. Arrange for appropriate disposal of all hazardous waste.
- E. See Specification Section 01 66 13, Product Storage & Handling Requirements for Hazardous Materials for more information and requirements.

3.5 SANITARY SEWER DISCHARGE POINT IDENTIFICATION

- A. If the Contractor will be disposing of water from a settling operation, or any other water approved by the District for sanitary sewer disposal, the Contractor will verify with the

Maintenance Department that the manhole used for disposal is a sanitary sewer and not a storm drain. (Note: do not assume that a manhole is a sanitary sewer, even if the words “sanitary sewer” is embossed on it. Sometimes utility maps and manhole cover designations are incorrect.)

3.6 WATER MAIN AND SANITARY SEWER LINE BREAK CONTINGENCY PLAN

- A. If working on or near a water main line or sanitary sewer line, the Contractor shall have a written emergency response plan that states procedures for responding to a break and release of supply water to the storm drain system. This plan shall be made part of the SWPPP. The Contractor shall meet the following requirements:
1. Water Main Work
 - a. Determine the direction of water flow if the main were to break.
 - b. Build a containment berm between the work area and the storm drain inlet(s) that the water would flow into. Make the containment structure large enough to hold the water so that it can be pumped to a sanitary sewer.
 - c. Build this containment structure before digging.
 - d. If there is a water main break, pump the water that collects in the containment structure to a sanitary sewer.
 - e. If the containment fails, prevent chlorinated water from entering the storm drain system.
 - f. Put in place, before digging, sediment control structures upstream of drain inlets and at drain inlets.
 - g. If a break occurs, contact the District and Project Inspector of record immediately.
 - h. Include in the plan the phone numbers of the District and Project Inspector contact information. Also include contact information for the State NCRWQCB representative for reporting requirements, if necessary.
 2. Sanitary Sewer Line Work.
 - a. Determine where the sewage will flow if the work could cause a blockage.
 - b. Build a containment structure between the work area and the storm drain inlet(s) that the sewage water would flow into. Make the containment structure large enough to hold the sewage flow so that it can be pumped to a sanitary sewer.
 - c. Build the containment before working on the sewer line. Put in place, before digging, solids (toilet paper, etc.) control structures upstream of drain inlets and at drain inlets.
 - d. If a sewage blockage occurs, pump it to a sanitary sewer, and do not allow it to flow into the storm drain system.
 - e. If the containment fails, prevent chlorinated water from entering the storm drain system by placing dechlorination sodium sulfite tablets in the sewage.
 - f. If a sewage blockage or spill occurs contact the District and Project Inspector of record immediately.
 - g. Include in the plan the phone numbers of the District and Project Inspector contact information. Also include contact information for the State NCRWQCB representative for reporting requirements, if necessary.
 3. Excavation Work. This Paragraph applies to Contractors that excavate in the vicinity of sanitary sewer lines and cause or discover a sewage spill, leak or blockage.

- a. Immediately notify the District. The District will immediately notify Project Inspector. Include in the plan the phone numbers of the District and Project Inspector contact information. Also include contact information for the State NCRWQCB representative for reporting requirements, if necessary.

3.7 PAVING OPERATIONS

- A. Project Site Management:
 - 1. When rain is forecast within 24 hours or during wet weather, the District or the QSP may prevent the Contractor from paving.
 - 2. The QSP may direct the Contractor to protect drainage courses by using control measures, such as earth dike, straw bale, straw wattles, and sandbag, to divert runoff or trap and filter sediment.
 - 3. The Contractor shall place drip pans or absorbent material under paving equipment when not in use.
 - 4. The Contractor shall cover catch basins and manholes when paving or applying seal coat, tack coat, slurry seal, or fog seal.
 - 5. If the paving operation includes an on-site mixing plant, the Contractor shall comply with the County’s General Industrial Activities Storm Water Permit requirements.
- B. Paving Waste Management: The Contractor shall not sweep or wash down excess sand (placed as part of a sand seal or to absorb excess oil) into gutters, storm drains, ponds, or creeks. Instead, the Contractor shall, either collect the sand and return it to the stockpile, or dispose of it in a trash container. The Contractor shall not use water to wash down fresh asphalt concrete pavement.

3.8 SAW CUTTING

- A. During saw cutting, the Contractor shall cover or barricade catch basins using control measures, such as filter fabric, straw bales, sand bags, and fine gravel dams, to keep slurry out of the storm drain system. When protecting a catch basin, the Contractor shall ensure that the entire opening is covered.
- B. The Contractor shall vacuum saw cut slurry and pick up the waste prior to moving to the next location or at the end of each working day, whichever is sooner.
- C. If saw cut slurry enters catch basins, the Contractor shall remove the slurry from the storm drain system immediately.

3.9 CONTAMINATED SOIL MANAGEMENT

- A. The Contractor shall look for contaminated soil as evidenced by site history, discoloration, odor, differences in soil properties, abandoned underground tanks or pipes, or buried debris. If the Project is not within an area of known soil contamination and no evidence of soil contamination is found, then testing of the soil shall only be required if directed by the District.

- B. If the Project is within an area of known soil contamination or evidence of soil contamination is found, then soil from grading or excavation operations shall be tested by the District's testing agency. The soil shall be managed as required by designated agency.

3.10 CONCRETE, GROUT, AND MORTAR WASTE MANAGEMENT

- A. Material Management: The Contractor shall store concrete, grout, and mortar away from drainage areas and ensure that these materials do not enter the storm drain system.
- B. Concrete Truck/Equipment Wash Out:
 - 1. The Contractor shall not wash out concrete trucks or equipment into streets, gutters, storm drains, ponds, or creeks.
 - 2. The Contractor shall perform washout of concrete trucks or equipment off-site.

3.11 PERSONNEL TRAINING

- A. The Contractor shall train its employees working on the Site on the requirements contained in this Section. The Contractor shall document this training in writing. District representatives for the Site will request to see the training materials and records at the onset of work.
- B. The Contractor shall inform all subcontractors (if any) of the water pollution prevention requirements contained in this specification and include appropriate subcontract provisions to ensure that these requirements are met.

3.12 LIST OF CONTRACTORS DESIGNATED SWPPP CONTACTS AND PHONE NUMBERS

- A. Provide a list of employees who will be responsible for preparing, implementing and updating the SWPPP, including, but not limited to, the name of the Contractor's QSD and the Contractor's QSP

END OF SECTION 01 57 23

**SECTION 01 61 00
COMMON PRODUCT REQUIREMENTS**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. All Contract Documents shall be reviewed for applicable provisions related to the provisions in this document, and provisions in the General Conditions and other Division 1 Specification Sections shall apply to this Section without limitation.

1.2 RELATED DOCUMENTS SPECIFIED IN OTHER SECTIONS

- A. Section 01 11 00 – “Summary of Work”
- B. Section 01 23 00 – “Alternates”
- C. Section 01 45 00 – “Quality Control”
- D. Section 01 62 00 – “Product Options”
- E. Section 01 77 00 – “Closeout Procedures”
- F. Divisions 2 through 41 Sections for Basic Product Requirements for the Work in those Sections.

1.3 SUMMARY

- A. This Section describes the basic requirements for the selection, handling, and storage of products to be used in the Project.

1.4 PRODUCTS

- A. All products are to be new and not previously incorporated into or used in any other project or facility. Products salvaged or recycled from other projects are not considered new products and are not permitted. Special circumstances may arise related to salvaged materials from the previous facility, and specifically incorporated into the design, as approved by the District. These circumstances will be approved by the District and design team.
- B. The term product, as used in the Contract Documents, includes materials, equipment, systems, and like terms of similar intent.
- C. Products include materials, machinery, components, equipment, fixtures and systems forming the Work and purchased for incorporation into the Work.
- D. Products do not include machinery and equipment used for preparation, fabrication, conveying and erection of the work. Products may also include existing materials or components required for reuse.
- E. Do not reuse materials and/or equipment removed from existing premises except as specifically permitted by the Contract Documents.
- F. Provide interchangeable components of the same manufacturer, for similar components.
- G. Named products are items identified in the Contract Documents by manufacturer’s product name, including make or model number or other designation shown or listed in manufacturer’s published product literature that is current as of date of the Contract Documents.

1.5 TRANSPORTATION AND HANDLING

- A. Transport and handle products in accordance with manufacturer’s instructions.
- B. Promptly inspect shipments to assure that products comply with requirements, quantities are correct, and products are undamaged.
- C. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, and/or other damage.

1.6 SHIPPING REQUIREMENTS

- A. Preparation for Shipment: All equipment shall be suitably packaged to facilitate handling and to protect against damage during transit and storage. All equipment shall be boxed, crated, or otherwise completely enclosed and protected during shipment, handling, and storage. All equipment shall be protected from exposure to the elements and shall be kept dry at all times.
- B. Painted and coated surfaces shall be protected against impact, abrasion, discoloration, and other damage. Painted and coated surfaces which are damaged prior to acceptance of equipment shall be repainted to the satisfaction of District at the expense of Contractor. Any refinished items shall carry the warranty specified in the Contract Documents for new items.
- C. Grease and lubricating oil shall be applied to all bearings and similar items.
- D. Identification: Before shipping, each item of equipment shall be tagged or marked as identified in the delivery schedule or on the Shop Drawings. Complete packing lists and bills of material shall be included with each shipment.

1.7 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Store products only in staging area per provisions of the Contract Documents.
- B. Handle, store, and protect products in accordance with manufacturer’s instructions, with seals and labels intact and legible. Store sensitive products in weather-tight, climate-controlled enclosures.
- C. For exterior storage of fabricated products, place on appropriate supports, above ground.
- D. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to avoid condensation.
- E. Store loose granular materials on solid flat surfaces in a well-drained area.
- F. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
- G. Arrange storage of products to permit access for inspection. Periodically inspect to assure products are undamaged and are maintained under specified conditions.
- H. Deliver, store and handle products using means and methods that will prevent damage, deterioration, and loss, including theft. Comply with manufacturer’s written instructions.
- I. Schedule product deliveries to minimize long-term storage at the Site and to prevent overcrowding of construction spaces.
- J. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.

- K. Deliver products to Site in an undamaged condition in manufacturer’s original sealed container or other packaging system, complete with intact and legible labels and instructions for handling, storing, unpacking, protecting, and installing.
- L. Contractor shall comply with the following without limitation:
 1. Contractor shall bear the responsibility for delivery of equipment, spare parts, special tools, and materials to the Site and shall comply with the requirements specified herein and provide required information concerning the shipment and delivery of the materials specified in the Contract Documents. These requirements also apply to any sub-suppliers making direct shipments to the Site. Acceptance of the equipment shall be made only after it is installed, tested, placed in operation and found to comply with all the specified requirements.
 2. All items shall be checked against packing lists immediately on delivery to the Site for damage and for shortages. Damage and shortages shall be remedied with the minimum of delay.
 3. No metalwork (including miscellaneous steel shapes and reinforcing steel) shall be stored directly on the ground. Masonry products shall be handled and stored in a manner to hold breakage, chipping, cracking, and spilling to a minimum. Cement, lime, and similar products shall be stored off the ground on pallets and shall be covered and kept completely dry at all times. Pipe fittings and valves may be stored out of doors, but must be placed on wooden blocking. PVC pipe, geo-membranes, plastic liner, and other plastic materials shall be stored off the ground on pallets and protected from direct sunlight.
 4. Electrical equipment and all equipment with antifriction or sleeve bearings shall be stored in weather-tight structures maintained at a temperature above 60 degree Fahrenheit. Electrical equipment controls and insulation shall be protected against moisture and water damage. All space heaters furnished in or with equipment shall be connected and operated continuously or according to manufacturer’s requirements.
 5. Equipment having moving parts such as gears, bearings, and seals, shall be stored fully lubricated with oil, grease, etc., unless otherwise instructed by the manufacturer. Manufacturer’s storage instructions shall be carefully followed.
 6. When required by the equipment manufacturer, moving parts shall be rotated a minimum of twice a month to ensure proper lubrication and to avoid metal to metal “welding”. Upon installation of the equipment, Contractor shall, at the discretion of District, start the equipment at one-half load for an adequate period of time to ensure that the equipment does not deteriorate from lack of use.
 7. When required by the equipment manufacturer, lubricant shall be changed upon completion of installation and as frequently as required thereafter during the period between installation and acceptance. New lubricants shall be put into the equipment by Contractor at the time of acceptance.
 8. Equipment and materials shall not have any pitting, rust, decay, or other deleterious effects of storage when installed in the Work.
 9. In addition to the protection specified for prolonged storage, the packing of spare units and spare parts shall be as for export packing and shall be suitable for long-term storage in a damp location. Each spare item shall be packed separately and shall be completely identified on the outside of the container.

10. Handling: Stored items shall be laid out to facilitate their retrieval for use in the Work. Care shall be taken when removing the equipment for use to ensure the precise piece of equipment is removed and that it is handled in a manner that does not damage the equipment.
11. Store products to allow for inspection, measurement, and/or counting of units.
12. Store materials in a manner that will not endanger adjacent Work.
13. Store products that are subject to damage by the elements, under cover in a weather-tight enclosure above ground, with ventilation adequate to prevent condensation.
14. Store cementitious products and materials on elevated platforms.
15. Store foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
16. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
17. Protect stored products from damage.
18. Protect liquids from freezing.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION 01 61 00

**SECTION 01 62 00
PRODUCT OPTIONS**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. All Contract Documents shall be reviewed for applicable provisions related to the provisions in this document, and provisions in the General Conditions and other Division 1 specification Sections shall apply to this Section without limitation.

1.2 RELATED REQUIREMENTS SPECIFIED IN OTHER SECTIONS

- A. Section 01 11 00 – “Summary of Work”
- B. Section 01 31 00 – “Project Management and Coordination”
- C. Section 01 45 00 – “Quality Control”
- D. Section 01 61 00 – “Common Product Requirements”
- E. Section 01 70 00 – “Execution and Closeout Requirements”
- F. Section 01 78 39 – “Project Record Documents”
- G. Division 2 through 41 Sections for specific requirements for Materials and Equipment (Product Options and Substitutions) for the work in those Sections.

1.3 SUMMARY

- A. This Section includes administrative and procedural requirements concerning product options and substitutions.

1.4 GENERAL

- A. The term product, as used in the Contract Documents, includes materials, equipment, systems, and like terms of similar intent.
- B. All products are to be new and not previously incorporated into or used in any other project or facility. Products salvaged or recycled from other projects are not considered new products and are not permitted. Special circumstances may arise related to salvaged materials from the previous facility, and specifically incorporated into the design, as approved by the District. These circumstances will be approved by the District and design team.
- C. Named products are identified in the Contract Documents by manufacturer’s product name, make or model number, and/or other specific designation.
 - 1. Do not use materials and/or equipment removed from existing premises, except as specifically permitted by the Contract Documents.
- D. List of Manufacturers and Products Required. The Contractor shall require all Subcontractors to prepare and submit to the Contractor, within thirty (30) days of execution of the Subcontract, four (4) copies of the comprehensive lists of manufacturers and products proposed for the Project, including information on materials, equipment, and fixtures required by the Contract Documents, as may be required for the Contractor’s or Architect’s approval.

1. Approval of such lists of products shall not be construed as a substitute for the shop drawings, manufacturer’s descriptive data, and samples, required by the Contract Documents, but rather shall be considered as a base from which more detailed submittals shall be developed for final review by the Contractor and the Architect.

1.5 PRODUCT SELECTION AND SUBSTITUTION REQUIREMENTS

- A. Substitutions are defined as any changes in products, materials, equipment, and/or methods of construction from those required by the Contract Documents, and that are proposed by the Contractor.
- B. When only one product is specified, and unless the Specifications state that no substitution is permitted, whenever the Contract Documents indicate any specific article, device, equipment, product, material, fixture, patented process, form, method, or type of construction or any specific name, make, trade name, or catalog number, with or without the words “or equal,” such specification shall be deemed to be used for the purpose of facilitating description of the material, process, or article desired and shall be deemed to be followed by the words “or equal” unless the Contract Documents specify “no substitution allowed”, “no equal”, “no equivalent”, “to match campus standard”, “single source,” or other language with similar meaning, in which case no substitutions will be allowed.
 1. Pursuant to Paragraph 3.11.4 of the General Conditions, the apparent lowest responsive and responsible bidder may, within three (3) work days after bid opening offer any material, process, article, etc., which shall be materially equal or better in every respect to that so indicated or specified (“Specified Item”) and will completely accomplish the purpose of the Contract Documents. to Paragraph 3.11.4 of the General Conditions, the Contractor may, unless otherwise stated below, at time of bid offer any material, process, article, etc., which shall be materially equal or better in every respect to that so indicated or specified (“Specified Item”) and will completely accomplish the purpose of the Contract Documents.
- C. For products specified by naming only one manufacturer and including the words “no substitutions allowed”, “no equal”, “to match campus standard”, “single source” and/or other phrase with similar meaning:
 1. There is no product option due to necessity to match existing products or systems, to meet other design criteria or dependencies, or to comply with established standards. No substitution will be allowed.
 2. If product becomes unavailable due to no fault of Contractor, submit Request for Substitution, including all information required herein.
- D. When more than one product is specified, and in the absence of language stating “no substitutions allowed”, “no equal”, “to match campus standard”, “single source,” or other phrase with similar meaning:
 1. Select products of any named manufacturer meeting all specified requirements, or submit a request for substitution at time of bid.
 2. If product becomes unavailable due to no fault of Contractor, submit Request for Substitution (RFS), including all information required herein.

- E. For products specified by naming one or more products followed by the words “or approved equal”:
 1. Select products of any named manufacturer meeting all specified requirements, or submit a request for substitution at time of bid.
- F. For products specified only by reference standard, select any product meeting or exceeding all requirements of the specified standard.
- G. Compatibility of product options: If Contractor is given an option of selecting between two or more products for use on the Project; product selected shall be compatible with products previously selected, even if previously selected products were also options.
 1. Contractor shall be responsible for providing products and construction means and methods that are compatible with the products and construction means and methods of other contractors.
- H. Products Specified which are Commercially Unavailable. If the Contractor fails to make a request for substitutions for products, at the time of submitting bids to the District, and such products subsequently become commercially unavailable, the Contractor may request a substitution for such commercially unavailable item.
 1. The decision to grant this request is solely at the District’s discretion. The written approval of the District, consistent with the procedure for Change Orders, shall be required for the use of a proposed substitute material.
 2. The District may condition its approval of the substitution upon the delivery to District of an extended warranty or other assurances of adequate performance of the substitution as well as an equitable deduction in the contract price should the substituted item cost less than the Specified Item.
 3. All risks of delay due to the approval of a requested substitution by the DSA, or any other governmental agency having jurisdiction, shall be on the requesting party. All additional costs, all procurement and construction delays, and all costs for review by the Architect or its consultants shall be the responsibility of the Contractor and will be deducted from Contractor’s pay request.
- I. Substitution Request Form. All requests for substitutions of products, materials, or processes in place of a Specified Item must be submitted in writing on the District’s Substitution Request Form (“Request Form”) within three (3) workdays after bid opening. The Request Form must be accompanied by evidence as to whether the proposed substitution meets the requirements of the Contract Documents as specified herein.
- J. After bids are opened, the apparent lowest responsive and responsible bidder shall provide, within five (10) days of opening such bids, any and all Drawing, Specifications, samples, performance data, calculations, and other information, as required herein to assist the Architect and the District in determining whether the proposed substitution is acceptable. The burden of establishing these facts shall be upon the bidder.
- K. After the District’s receipt of such evidence by the bidder, the District will make its final decision as to whether the bidder’s request for substitution for any Specified Items will be granted. The

decision as to whether a proposed request for substitution is equal to a Specified Item shall be at the sole discretion of the District.

1. Any request for substitution that is granted by the District shall be documented and processed through a Change Order.
 2. The District may condition its approval of any substitution upon delivery to the District of an extended warranty or other assurances of adequate performance of the substitution.
 3. Any and all risks of delay due to approval by the DSA or any other governmental agency having jurisdiction shall be on the bidder.
 4. In the event that the bidder has agreed in the Request Form to provide the Specified Item and the District denies the bidder's requested substitution for a Specified Item, the bidder shall provide the Specified Item without any additional cost or charge to the District.
- L. If the Architect and District accept a proposed substitution, the Contractor agrees to pay for all engineering and design services, including, without limitation, compensation to the Architect and affected engineers for their required time to process such substitution through the Division of the State Architect, if required, and to make all changes and adjustments in materials or the work of all trades directly or indirectly affected by the substituted item or items at no cost to the District.
- M. Substitutions will not be considered for acceptance (or, at the District's sole discretion, District may make Contractor solely responsible for all resulting costs, expenses and other consequences of a substitution) when a substitution:
1. Results in delay meeting established construction milestones and/or Phase completion dates.
 2. Is indicated or implied on submittals without formal Substitution Request from Contractor.
 3. Is requested directly by a Subcontractor or supplier.
 4. Acceptance will require substantial revision to the Contract Documents.
 5. Disrupts the Contractor's Work progress or ability to perform efficiently.
- N. Substitute products shall not be ordered without written acceptance of Architect and District.
- O. Architect and/or District shall determine acceptability of proposed substitutions and reserve right to reject proposals due to insufficient information.
- P. Accepted substitutions will be evidenced by a Change Order. All Contract Document requirements apply to all Work involving substitutions.
- Q. Coordinate all substitute products with Contractor's Construction and Submittal Schedules.

1.6 PRODUCTS WITH NO SUBSTITUTION ALLOWED

- A. No substitutions shall be allowed for District standard products. District standard products include:
1. See College of the Redwoods Telecommunication Standards (dated July 2018)
 2. See specifications for "Campus Standard Products"
 3. Toto toilet flush valves
 4. Greenheck exhaust fans for ventilations

5. Door closing & opening hardware by LCN-Allegion
6. Exterior hose bib, similar to Zurn A1320-CXL

1.7 PRODUCT SUBSTITUTION REQUESTS: REQUIRED INFORMATION

- A. Requests for substitutions of products, materials, or processes in place of a specified item must in writing on the District's Substitution Request Form at the time of submitting bids to the District.
- B. Except as provided in the Contract Documents with respect to "or equal" items, District will consider a Contractor's substitution request only when the specified product or products become unavailable due to no fault of Contractor.
- C. Requests for review of proposed substitute items will not be accepted from anyone other than Contractor.
- D. A Request for Substitution shall state the extent, if any, to which the evaluation and acceptance of the proposed substitute will prejudice Contractor's achievement of Substantial Completion of the Work or any Phase of the Work on time pursuant to the completion dates specified in the Contract Documents, and whether or not acceptance of the substitute for use in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with the District for Work on the Project.)
- E. Substitution Product List: Submit a list, in tabular form, showing specified product(s) and requested substitute product(s). Include generic names of products required, and manufacturer's proprietary name for each product. Provide all product data for each requested substitute product, variations from specified product, and other pertinent data as specified herein.
- F. Submit separate submittals (four copies) for each product substitution requested, to include the following:
 1. A statement either explaining why the specified product cannot be provided or why the Contractor is proposing a substitution.
 2. Product identification, including specification section number, and title.
 3. Manufacturer's literature, including product data and specifications.
 4. Physical samples, as applicable
 5. Color chart, as applicable.
 6. Name and address of similar projects on which product has been used, and dates of installation.
 7. Name, address, and telephone number of supplier, installer, and manufacturer's representative.
 8. Construction methods: Include detailed description with drawings or other illustrations as required for clarity.
 9. Provide product availability information with projected delivery date.
 10. A completed Substitution Request Form (see Section 01 31 40 "Administrative Forms and Logs") for each product substitution requested. Submittals with an incomplete Substitution Request Form will be returned to the Contractor without review.

11. A detailed comparison of the proposed substitution with specified product, listing all variations including all dimensional, weight, service requirements, and functional differences, if any. If variation(s) from the specified product is not identified in the submittal, it may be rejected.
12. Indicate available maintenance, repair, and replacement services for substitute products.
13. Contractor shall state whether the substitute will require a change in any of the Contract Documents (or provisions of any other direct contract with District for work on the Project) to adapt the design for the proposed substitute, and whether or not incorporation or use of the substitute in connection with Work is subject to payment of any license fee or royalty.
14. Contractor shall provide an accurate cost comparison of the proposed substitution with the specified product and identify the net change in Contract Price related to use of the proposed substitution.
 - a. The cost comparison shall include, but not be limited to, an itemized estimate of all costs or credits that will result directly or indirectly from acceptance of such substitute, and include costs for redesign and/or claims of other contractors affected by the resulting change.
 - b. Architect or District may require Contractor to furnish additional cost data concerning the proposed substitute.
15. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by District and separate contractors that will be necessary to accommodate proposed substitution.
16. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
17. Research/evaluation reports evidencing compliance with building code in effect for Project, from a model code organization acceptable to authorities having jurisdiction.
18. Submit complete information identifying any changes to the Contractor's Baseline CPM Schedule required as a result of the proposed substitution.
 - a. If specified product or method of construction cannot be provided within Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating lack of availability or other reason for delays in delivery.
 - 1) Contractor's certification that proposed substitution complies with requirements in the Contract Documents.
19. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.

1.8 CONTRACTOR'S REPRESENTATION AND WARRANTY

- A. Contractor's Substitution Request constitutes a representation and warranty that Contractor complies with all of the following requirements:
 1. Contractor has investigated proposed product and determined that it meets or exceeds, in all respects, the requirements for the specified product.
 2. Contractor shall provide the same warranty for substitution as for specified product.

3. Contractor shall coordinate installation and make all other changes that may be required for Work to be integrated and complete in all respects.
4. Contractor waives claims for any additional costs which may subsequently become apparent.
5. Contractor shall compensate District for any Construction Document revisions and/or agency approval costs associated with any product substitution. Any such compensation shall be deducted from the Contract Price by the District via Change Order.
6. Contractor shall be responsible for maintaining the Baseline CPM Schedule and for recovering any time lost due to a product substitution.
7. Contractor shall be responsible for any Baseline CPM Schedule delay caused by late ordering of available specified products caused by Substitution Requests that are subsequently rejected by the District.
8. Contractor shall compensate District for all costs, including extra costs for performing Work under Contract Documents, extra cost to other contractors, and any claims brought against District, caused by late Product Substitution Requests.

1.9 ARCHITECT’S ACTION

- A. Architect shall respond in writing to Contractor within (10) working days of receipt of a Substitution Request. Architect’s response shall include a list of unacceptable product selections and a brief explanation of reasons for this action. Architect’s response, or lack of response, does not constitute a waiver of requirement to comply with the Contract Documents.
- B. Architect shall notify Contractor in writing of decision to accept or reject Contractor’s requested substitution.
- C. If necessary, Architect may request additional information or documentation for evaluation Substitution Request. Architect shall notify Contractor of acceptance or rejection of proposed substitution within (5) working days of receipt additional information of documentation.

1.10 ADMINISTRATIVE REQUIREMENTS

- A. Specified products, materials, or systems for Project may include engineering or on-file standards required by the regulatory agency. Contractor’s substitution of products, materials or systems may require additional engineering, testing, reviews, approvals, assurances, or other information for compliance with regulatory agency requirements, or both. Contractor shall provide all agency approvals or other additional information required and pay additional costs for required District services made necessary by the substitution at no increase in Contract Price or Contract Time, and as a part of substitution proposal.

PART 2 – PRODUCTS

Not Used

PART 3 – EXECUTION

Not Used

END OF SECTION 01 62 00

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SECTION 01 66 13

PRODUCT STORAGE AND HANDLING REQUIREMENTS FOR HAZARDOUS MATERIALS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. All Contract Documents shall be reviewed for applicable provisions related to the provisions in this document, and provision in the General Conditions and other Division 1 Specification Sections shall apply to this Section without limitation.

1.2 RELATED REQUIREMENTS SPECIFIED IN OTHER SECTIONS

- A. Section 01 11 00 – “Summary of Work”
- B. Section 01 31 00 – “Project Management and Coordination”
- C. Section 01 31 19 – “Project Meetings”
- D. Section 01 42 00 – “References”
- E. Section 01 57 23 – “Storm Water Pollution Prevention Plan ‘SWPPP’”
- F. Divisions 2 through 41 Sections for Hazardous Materials requirements for the work in those Sections.

1.3 SUMMARY

- A. This Section describes Project requirements applicable to Work in connection with hazardous materials, hazardous waste, abatement and disposal including, but not limited to, asbestos and asbestos-containing materials, lead-based paint, polychlorinated biphenyls, petroleum-contaminated soils and materials, construction and demolition debris and any other hazardous substance or hazardous waste. This Section supplements the requirements elsewhere in the Contract Documents.

1.4 DISCOVERY OF HAZARDOUS MATERIALS

- A. In the event the Contractor encounters or suspects the presence on the Site of material reasonably believed to be asbestos, polychlorinated biphenyl (PCB), or any other material defined as being hazardous by § 25249.5 of the California Health and Safety Code, which has not been rendered harmless, the Contractor shall immediately stop Work in the area affected and report the condition to the District and copy the Architect in writing, whether or not such material was generated by the Contractor or the District. The Work in the affected area shall not thereafter be resumed, except by written agreement of the District and the Contractor, if in fact the material is asbestos, polychlorinated biphenyl (PCB), or other hazardous material, and has not been rendered harmless. The Work in the affected area shall be resumed only in the absence of asbestos, polychlorinated biphenyl (PCB), or other hazardous material, or when it has been rendered harmless by written agreement of the District and the Contractor.
- B. If hazardous materials are encountered, they shall be handled in accordance with applicable local, state and federal regulation which may include: (1) CCR Title 8, Division 4, Chapter 4, Sections 5163 through 5167 and 5192 (Hazardous Waste Operations and Emergency

Response); (2) CCR Title 22, Division 4.5, Chapters 10 through 13 and 18 (Environmental Health Standards for Management of Hazardous Waste); and (3) CCR Title 23, Division 3, Chapter 15 (Discharges of Hazardous Waste to Land).

- C. Should the discovery of contaminants cause delay to Contractor’s operation, extension of Contract Time will be granted by District in accordance with Section 00 70 00 (General Conditions) and Section 01 32 13 (Construction Scheduling.) Contractor may not be entitled to damages or additional payment due to such delays. District may, if it believes appropriate in its sole discretion, grant an extension of Contract Time.
- D. The Contractor shall take all measures to avoid and/or mitigate delays due to Hazardous Materials/Waste finds such as; avoiding the area of the find and proceeding with other work on the project; developing “work around” plans; and documenting his best efforts to avoid and/or mitigate delays. See Section 01 32 13 (Scheduling of Work) regarding requirement to demonstrate Time Impacts.

1.5 SUBSURFACE HAZARDOUS MATERIALS

- A. If Contractor encounters surface contamination, the following provisions and precautionary measures shall be implemented during construction.
 - 1. Contractor’s personnel shall be alert for and immediately report to the District any detectable chemical odors, unusual debris, or discolored soil.
 - 2. Disposal requirements: Soils containing hazardous materials shall be disposed by Contractor at permitted treatment, recycling, or disposal facilities in accordance with CCR Title 23, Division 3, Chapter 15 (Discharge of Waste to Land). Determine to which permitted treatment, recycling, or disposal facilities the soil will be delivered.
 - 3. Dewatering: Construct, operate and maintain as required by applicable laws, codes and standards and to complete the Work all necessary cofferdams, channels, pipes, flumes, drains, sumps, well points and protective works; and furnish, install, operate and maintain all necessary pumping and other equipment for dewatering the areas of Work suspected of containing hazardous materials; and control all surface flow and groundwater as may be encountered while performing the Work. Remove all water that may accumulate in the excavation while the Work progresses so that all Work can be performed in dry conditions. All contaminated water shall be removed from the excavation before it is backfilled. The excavation shall be kept free from water until backfilling has progressed to a height above the water source.
 - 4. Water sampling and chemical analysis: Water samples shall be collected from the holding tanks and submitted to a State-Certified chemical analysis laboratory. Chemical analyses required for the samples shall at a minimum include: TPHg following EPA Test Methods 5030/8015 (modified); benzene, toluene, ethyl benzene and total xylenes (BTEX) following EPA Test Method 8020; and chlorinated solvents following EPA Test Method 8010. Perform additional chemical analyses that may be required for disposal or recycling of the water.
 - 5. Laboratory chemical analysis reports associated with the water samples shall be provided to District’s Representative.
 - 6. Removal of dewatering equipment: After having served their purpose, all protective works and dewatering pumps, shall be decontaminated and removed from the Site.

Contractor is responsible for permanent disposal of all equipment that cannot be decontaminated or recycled in accordance with all applicable laws and regulations.

7. Fees: Pay for any fees associated with the treatment, recycling, or disposal of these soils. Any additional soil sampling and chemical analyses required for acceptance of the soil at facilities other than those described above may be deemed to be the responsibility of the Contractor.
8. Transport: Transport the soils to the selected facilities under approved manifests and submit copies of these manifests and the facility weight tickets to District's Representative.

1.6 HAZARDOUS MATERIAL WORK LIMITATIONS

- A. In the event that the presence of hazardous materials is suspected or discovered on the Site (except in cases where asbestos and other hazardous material work is the Contractor's responsibility), the District shall retain an independent testing laboratory to determine the nature of the material encountered and whether corrective measures or remedial action is required. The Contractor shall not be required pursuant to Specification Section 01250 to perform without consent any Work in the affected area of the Site relating to asbestos, polychlorinated biphenyl (PCB), or other hazardous material, until any known or suspected hazardous material has been removed, or rendered harmless, or determined to be harmless by District, as certified by an independent testing laboratory and approved by the appropriate government agency.
- B. To protect construction workers and members of the public from known or undiscovered hazardous building materials, including asbestos and lead, undertake all demolition activities in accordance with Cal-OSHA standards, contained in Title 8 of the California Code of Regulations (CCR). See Hazardous Materials Removal Specification 02 81 00 and Reports for additional requirements.
- C. During demolition activities, all building materials containing lead paint shall be removed in accordance with Cal-OSHA Lead in Construction Standard, title 8 and California Code of Regulations 1532.1.
- D. All potentially friable asbestos-containing materials (ACMs) shall be removed in accordance with National Emissions Standards for Hazardous Air Pollutants (NESHAP) guidelines prior to building demolition or renovation that may disturb the materials. Applicable standards include the following:
 1. The facility shall be inspected before any renovation occurs in which 160 square feet or more of building materials or 260 linear feet or more of pipe insulation will be disturbed at a regulated facility or any demolition occurs at a regulated facility.
 2. An asbestos notification form shall be submitted to the Bay Area Air Quality Management District (BAAQMD) for any regulated asbestos abatement project or regulated demolition 10 working days before the activity begins.
 3. If ACMs are discovered during a renovation or demolition, they must be removed before the project may proceed. Also, the Cal-OSHA and California Environmental Protection Agency (Cal-EPA) hazardous waste regulation apply in most cases.

- E. No Work will be accepted until asbestos contamination is reduced to levels deemed acceptable by the District's asbestos consultant.
- F. Interface of Work under this Contract with work containing asbestos shall be executed by the Contractor at his risk and at his discretion, with full knowledge of the currently accepted standards, hazards, risks, and liabilities associated with asbestos work and asbestos-containing products. By execution of this Contract, the Contractor acknowledges the above and agrees to hold harmless District and its assigns for all asbestos liability which may be associated with this work and agrees to instruct his employees with respect to the above-mentioned standards, hazards, risks, and liabilities.

1.7 INDEMNIFICATION BY CONTRACTOR FOR HAZARDOUS MATERIAL CAUSED BY CONTRACTOR

- A. In the event the hazardous materials on the Site is caused by the Contractor, the Contractor shall pay for all costs of testing and remediation, if any, and shall compensate the District for any additional costs incurred as a result of Contractor's generation of hazardous material on the t Site. In addition, the Contractor shall defend, indemnify and hold harmless District and its agents, officers, and employees from and against any and all claims, damages, losses, costs and expenses incurred in connection with, arising out of, or relating to, the presence of hazardous material on the Site.

1.8 TERMS OF HAZARDOUS MATERIAL PROVISION

- A. The terms of this Hazardous Material provision shall survive the completion of the Work and/or any termination of this Contract.

1.9 NON-UTILIZATION OF ASBESTOS MATERIAL

- A. NO ASBESTOS OR ASBESTOS-CONTAINING PRODUCTS SHALL BE USED IN THIS CONSTRUCTION OR IN ANY TOOLS, DEVICES, CLOTHING, OR EQUIPMENT USED TO AFFECT THIS CONSTRUCTION.
- B. Asbestos and/or asbestos-containing products shall be defined as all items containing, but not limited to, chrysotile, amosite, anthophyllite, tremolite, and antinolite.
- C. Any or all material containing greater than one-tenth of one percent (>.1%) asbestos shall be defined as asbestos-containing material.

1.10 REMOVAL OF CONTRACTOR INSTALLED ASBESTOS MATERIALS

- A. All Work or materials found to contain asbestos or Work or material installed with asbestos-containing equipment will be immediately rejected and this Work will be removed at no additional cost to the District.
 - 1. Decontamination and removal of Work found to contain asbestos or Work installed with asbestos-containing equipment shall be done only under supervision of a qualified consultant, knowledgeable in the field of asbestos abatement and accredited by the Environmental Protection Agency.
 - 2. The asbestos removal contractor shall be appropriately licensed and registered, qualified in the removal of asbestos and shall be approved by the asbestos consultant, who shall have sole discretion and final determination in this matter.

3. The asbestos consultant shall be approved by the District, who shall have sole discretion and final determination in this matter.

1.11 NATURALLY OCCURRING ASBESTOS

- A. To protect construction workers and members of the public from exposure to known areas of naturally-occurring asbestos (NOA), all ground disturbing activities will be undertaken in accordance with all applicable Cal-OSHA standards, contained in Title 8 of the California Code of Regulations (CCR). In addition, any ground-disturbing activity in an area that meets one or more of the applicability criteria for the Asbestos Airborne Toxic Control Measure (ATCM) for Construction, Grading, Quarrying and Surface Mining Operations, as adopted by the California Air Resources Board (CARB), is subject to the requirements therein, Per Section 93105 (b) of the ATCM, these criteria are as follows:
 1. The area to be disturbed is located in a geographic ultramafic rock unit; or
 2. The area to be disturbed has naturally-occurring asbestos, serpentine, or ultramafic rock as determined by the District, or the Air Pollution Control Officer (APCO); or
 3. Naturally-occurring asbestos, serpentine, or ultramafic rock is discovered by the District, a registered geologist, or the APCO in the area to be disturbed after the start of any construction, grading, quarrying, or surface mining operation.

1.12 REFERENCES TO REGULATORY REQUIREMENTS

- A. Codes, laws, ordinances, rules and regulations applicable to the Work shall have full force and effect as though printed in full in the Contract Documents. Codes, laws, ordinances, rules and regulations are not furnished to Contractor, because Contractor is assumed to be familiar with their requirements. The listing herein of applicable codes, laws, and regulations for hazardous waste abatement work is supplied to Contractor as a courtesy and shall not limit Contractor’s responsibility for complying with all applicable laws, regulations or ordinances having application to the Work. Where conflict among the requirements or with these Contract Documents exists, the most stringent requirements shall be used.
- B. Conform to all applicable codes, laws, ordinances, rules and regulations that are in effect on date of contracting.

1.13 LAWS, ORDINANCES, RULES, AND REGULATIONS

- A. During prosecution of Work under Contract Documents, Contractor shall comply with applicable laws, ordinances, rules and regulations including, but not limited to, those listed below.
- B. Federal:
 1. Statutory Requirements:
 - a. Resource Conservation and Recovery Act, 42 U.S.C. Sections 6901 *et seq.*
 - b. Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986, 42 U. S.C. Sections 9601 *et seq.*
 - c. Toxic Substances Control Act of 1976, 15 U.S.C., Sections 2601 *et seq.*
 - d. Hazardous Materials Transportation Act of 1975, 49 U.S.C. Sections 1801 *et seq.*
 - e. Clean Water Act, 33 U.S.C. Sections 1251 *et seq.*

- f. Safe Drinking Water Act, 42 U.S.C., Sections 3001 et seq.
 - g. Clean Air Act, Section 112, 42 U.S.C., Section 7412
 - h. Occupational Safety and Health Act of 1970, 29 U.S.C., Sections 651 et seq.
 - i. Underground Storage Tank Law, 42 U.S.C., Sections 6991 et seq.
 - j. The Emergency Planning and Community Right to Know Act of 1986, 42 U.S.C.,
 - k. Sections 11011 et seq.
- 2. Environmental Protection Agency (EPA):
 - a. 40 C.F.R. Parts 260, 264, 265, 268, 270
 - b. 40 C.F.R. Parts 258 et seq.
 - c. 40 C.F.R. Part 761
 - d. 40 C.F.R. Parts 122-124
 - 3. Occupational Safety and Health Administration (OSHA):
 - a. OSHA Worker Protection Standards, Title 29 C.F.R. Part 1926.58, Construction Standards and 29 C.F.R. 1910.1001 General Industry Standard
 - b. OSHA, 29 C.F.R. Part 1926.1101, Construction Standards for Asbestos
 - c. OSHA, Lead Exposure in Construction: Interim Final Rule, 29 C.F.R. 1926.62
 - d. National Emission Standard for Hazardous Air Pollutants, Title 40 C.F.R. Part 61
 - e. Asbestos Hazardous Emergency Response Act, Title 40 C.F.R. 763
 - 4. Department of Transportation:
 - a. Title 49 C.F.R. 173.1090
 - b. Title 49 C.F.R. 172
 - c. Title 49 C.F.R. 173
 - d. DOT, HM 181 and MH126f
- C. State of California Requirements:
- 1. Statutory Law:
 - a. The Carpenter-Presley-Tanner Hazardous Substance Account Act, Health & Safety Code, Sections 25300 et seq.
 - b. Health and Safety Code, Section 25359.4
 - c. Hazardous Waste Control Law, Health & Safety Code, Sections 25100 et seq.
 - d. Porter-Cologne Water Quality Control Act, Water Code, Sections 13000 et seq.
 - e. Health and Safety Code, Sections 25915-25924
 - f. California Labor Code Chapter 6, including, without limitation, Sections 6382, 6501.5-6501.9, 6503.5, 9021.5, 9080
 - g. Business and Professions Code, including without limitation, Sections 7058.5, 7065.01, 7118.5
 - h. Underground Storage of Hazardous Substance Act, Health and Safety Code, Sections 25280 et seq.

- i. Petroleum Underground Storage Tank Cleanup, Health and Safety Code, Sections 25299.10 *et seq.*
 - j. Safe Drinking Water and Toxic Enforcement Act of 1986, Health & Safety Code, Sections 25249.5 *et seq.* (Proposition 65)
 - k. Above Ground Petroleum Storage Act, Health and Safety Code, Sections 25270 *et seq.*
 - l. Hazardous Materials Release Response Plans and Inventory, Health and Safety Code, Chapter 6.95
2. Administrative Code and Regulations:
- a. Title 22 CCR Division 4.5, Environmental Health Standards for the Management of Hazardous Waste, Sections 6600 *et seq.*
 - b. Title 8 CCR, Section 1529, Asbestos
 - c. Title 8 CCR, Section 1532.1, Lead in Construction
 - d. Title 23 CCR, Sections 2610 *et seq.*
3. Local Agency Requirements:
4. Local Agency Requirements:
- a. Humboldt County Fire Protection District
 - b. City of Eureka, CA

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

Not Used.

END OF SECTION 01 66 13

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**SECTION 01 71 23
FIELD ENGINEERING**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. All Contract Documents shall be reviewed for applicable provisions related to the provisions in this document, and provisions in the General Conditions and other Division 1 Specification Sections shall apply to this Section without limitation.

1.2 RELATED REQUIREMENTS SPECIFIED IN OTHER SECTIONS

- A. Section 01 11 00 – “Summary of Work”
- B. Section 01 31 00 – “Project Management and Coordination”
- C. Section 01 57 23 – “Temporary Storm Water Pollution Control”
- D. Divisions 2 through 41 Sections for Field Engineering requirements for the work in those sections.

1.3 SUBMITTALS

- A. Contractor shall submit name and address of Surveyor and professional Engineer to District and Architect for approval prior to their work on the Project.
- B. On request of District and Architect, Contractor shall submit documentation to verify accuracy of field engineering work, at no additional cost to the District.
- C. At completion of the Work, Contractor shall submit a certificate signed by a licensed engineer or surveyor certifying that all elevations and locations of improvements are in conformance with Contract Documents.

1.4 REQUIREMENTS

- A. Contractor shall provide and pay for field engineering services by an engineer licensed in the State of California, required for the Project, including, without limitation:
 - 1. Survey work required in execution of the Project.
 - 2. Civil or other professional engineering services specified, or required to execute Contractor’s construction methods.

1.5 QUALIFICATIONS OF SURVEYOR OR ENGINEERS

- A. Contractor shall only use a qualified licensed engineer or registered land surveyor, approved by the District.

1.6 SURVEY REFERENCE POINTS

- A. Existing basic horizontal and vertical control points for the project are those designated on the Drawings.
- B. Contractor shall locate and protect control points prior to starting Site Work and preserve all permanent reference points during construction. In addition, Contractor shall:

1. Make no changes or relocation without prior written notice to District and Architect.
2. Report to District and Architect when any reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.
3. Require surveyor to replace project control points based on original survey control that may be lost or destroyed.
4. Contractor to locate and protect existing survey control and reference points.
5. Control datum for survey is that indicated on Drawings.
6. Protect survey control points prior to starting Site Work; preserve permanent reference points during construction.
7. Promptly report to Architect, District, and Project Inspector the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.
8. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice.

1.7 PROJECT RECORD DOCUMENTS

- A. Maintain complete, accurate log of control and survey work as it progresses. Indicate dimensions, locations, angles, and elevations of construction and Site Work.
- B. Submit Record Documents under provisions of Section 01 78 39.

1.8 EXAMINATION

- A. Verify locations of survey control points prior to starting Work.
- B. Promptly notify District of any discrepancies discovered.

1.9 SURVEY REQUIREMENTS

- A. Provide field engineering services. Utilize recognized engineering survey practices.
- B. Establish a minimum of two permanent benchmarks on Site, referenced to established control points. Record locations, with horizontal and vertical data, on Project Record documents.
- C. Establish lines and levels, locate and lay out by instrumentation and similar appropriate means:
 1. Site improvements including pavements; stakes for grading, fill and topsoil placement; utility locations, slopes, and invert elevations.
 2. Grid or axis for structures.
 3. Building foundation, column locations, and ground floor elevations.
- D. Periodically verify layouts by same means.

1.10 QUALITY CONTROL

- A. Employ a professional Engineer of the discipline required for specific service on Project, licensed in the State of California.
- B. Submit evidence of Engineer's errors and omissions insurance coverage to District, in the form of a current Insurance Certificate.

PART 2 – PRODUCTS

Not Used

PART 3 – EXECUTION

- 3.1** Contractor is responsible for meeting all applicable codes, OSHA, and other safety and shoring requirements.
- 3.2** Contractor is responsible for any re-surveying required by correction of nonconforming work with no additional cost to the District or its representatives.

END OF SECTION 01 71 23

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**SECTION 01 71 23.16
CONSTRUCTION SURVEYING**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. All Contract Documents shall be reviewed for applicable provisions related to the provisions in this document, and provisions in the General Conditions and other Division 1 Specification Sections shall apply to this Section without limitation.

1.2 RELATED REQUIREMENTS SPECIFIED IN OTHER SECTIONS

- A. Section 01 11 00 – “Summary of Work”
- B. Section 01 33 00 – “Submittal Procedures”
- C. Section 01 71 23 – “Field Engineering”
- D. Section 01 78 39 – “Project Record Documents”
- E. Division 2 through 41 Sections for Conformance Surveying requirements for the work in those Sections

1.3 SUMMARY

- A. All necessary Project construction surveying and Project layout Work shall be completed by a Land Surveyor currently licensed in the State of California, and be based on established site bench marks, monuments, lines and levels necessary for the Work covered by this Contract without additional cost to the District.
- B. Scope of Work: Provide construction surveying required for proper completion of the Work including, but not limited to:
 - 1. All applicable Project components.

1.4 SUBMITTALS

- A. Contractor will be required to submit seven (7) hard copies, wet stamped and signed by the licensed Land Surveyor and one (1) electronic copy on CD or USB data stick, of all construction surveys for the Project.

PART 2 – PRODUCTS

Not Used.

PART 3 - EXECUTION

3.1 LAYING OUT THE WORK

- A. Prior to beginning work, Contractor shall secure the electronic grading plan from the Architect. The Surveyor shall provide all construction survey drawings both as-constructed spot elevations and compare these elevations to those on the Contract Documents for the same location. Contractor shall show the difference in these two numbers.
- B. Accuracy to all Surveys provided in this section shall be to 0.01 feet.

END OF SECTION 01 71 23.16

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SECTION 01 73 00

EXECUTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. All Contract Documents shall be reviewed for applicable provisions related to the provisions in this document, and provisions in the General Conditions and other Division 1 Specification Sections shall apply to this section without limitation.

1.2 RELATED REQUIREMENTS SPECIFIED IN OTHER SECTIONS

- A. Section 01 11 00 – “Summary of Work”
- B. Section 01 71 23 – “Field Engineering
- C. Section 01 71 23.16 – “Construction Surveying”
- D. Section 01 31 00 – “Project Management and Coordination”
- E. Section 01 74 00 – “Cleaning and Waste Management”
- F. Section 01 77 00 – “Closeout Procedures”
- G. Divisions 2 through 41 Sections for Execution Requirements for the work in those Sections.

1.3 SUMMARY

- A. This Section includes Administrative and General procedural requirements governing execution of the Work including, but not limited to, the following:
 - 1. Construction layout
 - 2. General installation of products
 - 3. Coordination of District-installed products
 - 4. Starting and adjusting
 - 5. Protection of installed construction
 - 6. Correction of the Work

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Acceptance of Conditions: Examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record all observations in writing.
 - 1. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:

- a. Description of the Work
 - b. List of detrimental conditions, including substrates
 - c. List of unacceptable installation tolerances
 - d. Recommended corrections
2. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
 3. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
 4. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.
- B. Existing Site and/or Building Conditions: The existence and location of site improvements, utilities, and other construction indicated as existing are not guaranteed. Before beginning Work, investigate and verify the existence and location of mechanical and electrical systems and other construction affecting the Work.
1. Before construction, verify the location and points of connection of all utility services for each Phase of the Work and the entire Project.
- C. Existing Utilities: The existence and location of underground and other utilities and construction indicated in the Contract Documents as existing are not guaranteed. Prior to beginning the Work, investigate and verify the existence and location of all underground utilities and/or other improvements affecting the Work.
1. Before construction, verify the location and invert all elevations at points of connection of sanitary sewer, storm sewer, and water-service piping; and all underground electrical services.
 2. Furnish location data for work related to Project that must be performed by public utilities serving Site.

3.2 PREPARATION

- A. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents, submit a written request for information (RFI) to the District and a copy to the Architect.
- B. Existing Utility Information: Furnish information to the District and a copy to the Architect that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Contractor shall coordinate with authorities having jurisdiction.
- C. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, Contractor shall investigate and verify all dimensions of other construction by field measurements before fabrication. Contractor shall coordinate fabrication schedule with construction progress to avoid delaying the Work.
- D. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Contract Documents. Contractor shall be responsible for all coordination and measurements including means and methods of Construction.

3.3 CONSTRUCTION LAYOUT

- A. Verification: Before proceeding to lay out the Work, Contractor shall verify layout information and Field condition in relation to the Contract documents. Notify District and copy the Architect immediately of any discrepancies.

3.4 INSTALLATION

- A. Contractor shall locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
 - 1. Make vertical work plumb and make horizontal work level.
 - 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
 - 3. Conceal pipes, ducts, and wiring in furnished areas, unless otherwise indicated.
 - 4. Maintain minimum headroom clearance of eight feet in spaces without a suspended ceiling.
- B. Contractor shall comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Contractor shall install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for performance until accepted by District.
- D. Contractor shall conduct construction operations, so no part of the Work is subjected to damage or loading in excess of that expected during normal conditions of occupancy.
- E. Tools and Equipment: Do not use tools or equipment that produces harmful noise levels. Contractor shall comply with noise requirements in Section 01 35 00, Special Procedures
- F. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- G. Anchors and Fasteners: Provide anchors and fasteners as required to anchor each component securely in place, accurately located and aligned with other portions of the Work.
- H. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
- I. Allow for building movement, including thermal expansion and contraction.
- J. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to the Site in time for installation.
- K. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- L. Hazardous Materials: Use only products, cleaners, and installation materials that are not classified as or considered hazardous.

3.5 DISTRICT-INSTALLED PRODUCTS

- A. Site Access: Provide access to Site for District’s construction forces.
- B. Coordination: Coordinate construction and operations of the Work with work performed by District construction forces.
 - 1. Baseline CPM Schedule: Inform District of Contractor’s preferred schedule for District’s portion of the Work. Adjust Baseline CPM Baseline CPM Schedule based on a mutually agreeable timetable. Provide timely notice (i.e., at least 14 calendar days) to the District if changes to schedule are required due to differences in actual construction progress.
 - 2. Pre-installation Conferences: Include District’s construction forces at pre-installation conferences covering portions of the Work that are to receive District’s work. Attend pre-installation conferences conducted by District’s construction forces if portions of the Work depend on District’s construction forces.

3.6 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.
- B. Comply with manufacturer’s written instructions for temperature and relative humidity.

3.7 CORRECTION OF THE WORK

- A. Repair or remove and replace defective construction. Restore damaged substrates and finishes. Comply with requirements Section 01 73 29, Cutting and Patching.
 - 1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.
- B. Restore permanent facilities used during construction to their specified condition. See also Section 01 50 00, Temporary Facilities and Controls.
- C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.
- D. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.
- E. Remove and replace chipped, scratched, and/or broken glass or reflective surfaces.

END OF SECTION 01 73 00

SECTION 01 73 29
CUTTING AND PATCHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. All Contract Documents shall be reviewed for applicable provisions related to the provisions in this document, and provisions in the General Conditions and other Division 1 Specification Sections shall apply to this section without limitation.
- B. Individual Product Specification Sections:
 - 1. Cutting and patching incidental to work of the section.
 - 2. Advance notification to other sections of openings required in work of those sections.
 - 3. Limitations on cutting structural members.

1.2 RELATED REQUIREMENTS SPECIFIED IN OTHER SECTIONS

- A. Section 01 31 00 – “Project Management and Coordination”
- B. Section 01 74 00 – “Cleaning and Waste Management”
- C. Section 01 73 00 – “Execution”
- D. Divisions 2 through 41 Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work.

1.3 DEFINITIONS

- A. Cutting: Removal of in-place construction necessary to permit installation or performance of other Work.
- B. Patching: Fitting and repair work required to restore surfaces to new or original conditions after installation of other Work.

1.4 RESPONSIBILITIES

- A. Contractor shall be responsible for all cutting, fitting, and patching, including associated excavation and backfill, required to complete the Work. This includes, but is not limited to:
 - 1. Making parts fit together properly
 - 2. Removal and replacement of defective Work
 - 3. Removal and replacement of Work not conforming to requirements of Contract Documents
 - 4. Provide routine penetrations of non-structural surfaces for installation of piping and electrical conduit
 - 5. Attaching new materials to existing improvements
 - 6. Painting (or other finishes) to match adjacent or existing conditions
- B. Contractor shall not cut or alter any part of the Work in such a way that endangers or compromises the integrity of the Work, the work of others, or the Project.

1.5 QUALITY ASSURANCE

- A. Requirements for Cutting and Patching relating to structural elements: Do not cut and/or patch structural elements in a manner that would alter their structural design characteristics.
 - 1. Obtain written approval of the cutting and patching proposal from the Structural Engineer of Record and DSA prior to cutting and/or patching any structural elements. Structural elements include, but are not limited to:
 - a. Foundation construction
 - b. Structural Concrete
 - c. Structural Steel
 - d. Wood Framing
 - e. Bearing and retaining walls
 - f. Stair systems
 - g. Roofing and framing systems
 - h. Glue lam beam
 - i. Shear wall systems
 - 2. Where cutting and patching Work involves adding reinforcement to structural elements, submit details and engineering calculations showing integration of reinforcement with original structure. Contractor shall be responsible for any costs associated with required Structural Engineer and/or DSA reviews and approvals.
- B. Operational Limitations: Do not cut and patch operating elements or related components in a manner that would result in reducing their capacity to perform as intended. Do not cut and patch operating elements or related components in a manner that would result in increased maintenance or decreased operational life or safety.
- C. Visual Requirements: Do not cut and patch exposed Work in a manner that would, in the Architect or District’s opinion, reduce the building’s aesthetic qualities. Do not cut and patch construction in a manner that would result in visual evidence of cutting and patching. Remove and replace construction cut and patched in a visually unsatisfactory manner as directed by District.
- D. Contractor shall ensure that all cutting, fitting, and patching shall achieve the security, strength, weather protection, and appearance for aesthetic match, efficiency, operational life, maintainability, safety of operational elements, and the continuity of existing fire ratings as required by the Contract Documents.
- E. Contractor shall ensure that cutting, fitting, and patching shall successfully duplicate undisturbed adjacent profiles, materials, textures, finishes, colors, and that materials shall match existing construction. Where there is dispute as to whether duplication is successful or has been achieved to a reasonable degree, the District’s decision shall be final.
- F. Operational Elements: Do not cut and patch operating elements and/or related components in a manner that results in reducing their capacity to perform as intended, results in increased maintenance requirements, that decreases operational life, or that affects system or component safety. Operating elements include, but are not limited to the following:

1. Fire-suppression systems.
 2. HVAC systems.
 3. Control systems.
 4. Mechanical systems piping and ducts.
 5. Air smoke barriers
 6. Telephone and communication systems.
 7. Electrical wiring systems.
 8. Primary operational systems and equipment.
- G. Miscellaneous Elements: Do not cut and patch miscellaneous elements or related components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or those results in increased maintenance or decreased operational life or safety. Miscellaneous elements include, but are not limited to the following items:
1. Exterior curtain wall construction
 2. Equipment supports
 3. Noise-and vibration-control elements and systems
 4. Water, moisture, or vapor barriers
 5. Membranes and flashings
 6. Vessels, and equipment

1.6 PAYMENT FOR COSTS

- A. Cost caused by ill-timed or defective cutting and patching Work or Work not conforming to Contract Documents, including costs for additional services of the District and its consultants will be borne by the Contractor and deducted from the Contract Price via Change Order by the District.
- B. Cost of Work cutting and patching Work performed upon approval from the District, other than defective or nonconforming Work, will be paid by District via written Change Order.

1.7 WARRANTY

- A. Existing Warranties: Remove, replace, cut, patch, and repair materials and surfaces damaged during cutting and patching operations, by methods and with materials so as not to void existing warranties of any affected Work.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Contractor shall provide for replacement and restoration of any Work affected by cutting and patching operations. Contractor shall comply with the Contract Documents and with the Industry Standard(s), for the type of Work involved. If not specified, Contractor shall first recommend a product of a manufacturer or appropriate trade association for approval by the District.

- B. Materials to be cut and patched include those damaged by Contractor in the performance of the Work.
- C. Use materials identical to existing materials. For exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible. If identical materials are unavailable or cannot be used, use materials whose installed performance will equal or exceed that of existing materials and that are visually compatible in the sole opinion of the District.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Contractor shall inspect existing conditions of the Site and the Work, including elements subject to movement or damage during cutting and patching, excavating and backfilling. After uncovering Work, Contractor shall inspect conditions affecting the installation of new products.
- B. Contractor shall report unsatisfactory or questionable conditions in writing to District as indicated in the Contract Documents, and shall proceed with Work as directed by District.

3.2 PREPARATION

- A. Contractor shall provide adequate shoring, bracing and supports as required to maintain structural integrity for all portions of the Project during cutting and patching operations.
- B. Contractor shall provide devices and means and methods to protect other portions of Project from damage during cutting and patching operations.
- C. Contractor shall provide all necessary protection from weather and extremes of temperature and humidity for the Project, including without limitation, any work that may be exposed by cutting and patching Work. Contractor shall keep excavations free from water.
- D. Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.
- E. Do not cut existing pipe, conduit, or ductwork serving existing buildings and/or other improvements that are scheduled to be removed or relocated until provisions have been made to bypass them. Maintain all active existing services at all times.

3.3 PERFORMANCE

- A. With respect to performance, Contractor shall:
 - 1. Execute cutting and patching Work to provide finished installation complying with specified tolerances and matching adjacent finishes.
 - 2. Execute cutting and patching using means and methods that will prevent damage to other Work, and that will result in proper surfaces to receive installation of repairs and/or new Work.
 - 3. Execute cutting, demolition, patching, excavating, and backfilling by methods that will prevent damage to other Work and damage from settlement or other movement.
 - 4. Contractor shall employ original installer or fabricator to perform cutting and patching for:
 - a. Weather-exposed surfaces and moisture-resistant elements such as roofing, sheet metal, sealants, waterproofing, and other similar Work.

- b. Exposed finished surfaces
5. Contractor shall fit Work airtight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces. Contractor shall conform to Contract Document requirements for penetrations. If a discrepancy exists between applicable Code requirements and the Contract Documents, the more stringent requirement shall apply.
 6. Completed cutting and patching Work shall not affect the integrity of fire walls, ceilings, floors, smoke barriers, shafts, and similar components.
 7. Contractor shall restore Work which has been cut or patched. Contractor shall install new products to provide completed Work in accordance with requirements of the Contract Documents and as required to match adjacent areas and surfaces.
 8. Contractor shall refinish all continuous surfaces to nearest intersection as necessary to match the new finish to any existing finish.
 9. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage adjacent Work to remain. If possible, review proposed procedures with original Installer and comply with his written recommendations.
 - a. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 - b. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
 10. Concrete and Masonry: cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
 11. Excavating and Backfilling: Comply with requirements in applicable specification sections where required by cutting and patching operations.
 12. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
 13. Proceed with patching after construction operations requiring cutting are complete.
 14. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections.
 15. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.
 16. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
 - a. Clean all materials affected by cutting and patching operations before applying finishes.
 - b. Restore any damaged pipe covering to original condition.
 - c. Floors and Walls: Where walls or partitions that are removed extend from one finished area into another, patch and repair floor and wall surfaces in both spaces. As required

to provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials as necessary to achieve uniform color and appearance.

- d. Where patching occurs on a painted surface, apply specified primer and intermediate coats over the patch. Apply final coat over entire unbroken surface containing the patch. Provide additional coats as required until patched area blends completely with adjacent surfaces.
- 17. Ceilings: Patch, repair, or re-hang in-place ceilings as necessary to provide a level, planar surface of uniform appearance.
 - 18. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weather-tight condition and results in a uniform visual appearance.
- B. Cleaning: Clean areas, spaces, materials, and/or equipment where cutting and patching Work is performed. Completely remove dirt, dust, cuttings, paint, mortar, oils, putty, adhesive, and any other similar materials.
 - C. Alterations to Existing Work:
 - 1. Existing work shall be cut, drilled, altered, removed, or temporarily removed and replaced as necessary for performance of work under the Contract. Work that is replaced shall match similar existing work. Structural members shall not be cut or altered, except where noted on drawings, without authorization of the Structural Engineer. Work remaining in place, which is damaged or defaced during this contract, shall be restored to the condition existing at time of award of contract.
 - 2. Discolored or unfinished surface exposed by removal of existing work and indicated to be the final exposed surfaces shall be refinished or the material shall be replaced as necessary to make contiguous work uniform and harmonious. Work out of alignment, where exposed by removal of existing work, shall be called to the District's attention with a copy to the Architect's.

END OF SECTION 01 73 29

**SECTION 01 74 00
CLEANING AND WASTE MANAGEMENT**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. All Contract Documents shall be reviewed for applicable provisions related to the provisions in this document, and provisions of General Conditions and other Division 1 Specification Sections shall apply to this Section without limitation

1.2 RELATED REQUIREMENTS SPECIFIED IN OTHER SECTIONS

- A. Section 01 45 00 – “Quality Control Requirements”
- B. Section 01 50 00 – “Temporary Facilities and Controls”
- C. Section 01 74 01 – “Universal Waste – Handling Procedures”
- D. Section 01 74 19 – Not Used
- E. Section 01 57 23 – “Temporary Storm Water Pollution Prevention Plan”
- F. Section 01 73 00 – “Execution Requirements”
- G. Section 01 77 00 – “Closeout Procedures”
- H. Divisions 2 through 41 Sections for specified Cleaning Requirements for the work in those Sections.

1.3 DISPOSAL OF MATERIALS

- A. Not Used
- B. As part of the scope of Work included within the Contract Price, Contractor shall be fully responsible for disposing of all construction debris, dirt and spoils resulting from the Work.
- C. All waste materials, debris, topsoil, lime treated soil and rubbish shall be disposed of at sites to be chosen by Contractor in accordance with applicable local, state and federal regulations and requirements of the Contract Documents. Also see Section 01 66 13.
 - i) Uncontaminated soil suitable for reuse as fill can be stockpiled and deposited at the designated stockpiling areas shown on A050 subject to Geotechnical Engineer approval.
- D. Contractor is cautioned that both the County of Humboldt and cities within the County have regulations governing the disposal of rubble, broken pavement, and similar materials.
- E. Contractor shall become familiar with the requirements of the agency having jurisdiction over any contemplated disposal site and shall comply with requirements.
- F. Under no circumstances shall rubbish, debris, waste, dust, dirt or surplus materials be allowed to accumulate in the building or on the Site, and all such shall be removed continually as the Work progresses and by the end of each day’s Work.
 - 1. Materials: In occupied building areas, only sufficient materials and flammable or toxic substances necessary for the Work being performed that day or shift shall be brought into the building and work areas. In no case shall flammable or toxic substances be stored in

the building, and these substances shall be immediately removed from the building when not needed and not later than the end of the day's Work.

2. Splattering or spilling of material shall be promptly cleaned up at time of occurrence.
- G. Contractor shall provide sweeping whenever silt from Site is carried over to adjacent pedestrian paths, parking lots, and streets within the Campus as well as public thoroughfares surrounding the Campus.
- H. Failure to maintain a clean and orderly Site may necessitate action by the District. In the event that the Contractor fails to clean up and maintain the project in a clean and orderly manner, the District may clean the Site and charge the Contractor for such cleaning costs. Any cleaning costs incurred by District will be deducted from the Contract Price by Change Order.
- I. All trash, debris, waste, and excess soil resulting from performance of the Work shall be disposed of at sites to be chosen by Contractor in accordance with applicable local, state, and federal regulations. If Contractor elects to dispose of soil on any private property, a permission letter shall be obtained from the property owner and presented to District prior to disposal. Contractor is advised that the property owner is required to obtain a fill permit from the applicable government agency(ies). In addition, placement of fill in wetland areas is subject to permit procedures of the US Army Corps of Engineers. At the completion of Work, a letter from each affected property owner releasing Contractor, Humboldt County, District, and District consultants from any future liability.

1.4 FINAL CLEANING

- A. District's Representative's Inspection: Provide District at least twenty-four (24) hours advance notice of readiness for inspection.
- B. Any deficient cleaning, as determined by District's Representative, shall be immediately corrected as directed by District at Contractor's expense.
- C. Contractor shall execute final cleaning prior to final inspection, using only properly skilled workers.
- D. Remove grease, dust, dirt, stains, labels, fingerprints, and other foreign materials from exposed interior and exterior finished surfaces.
- E. Repair, patch, and touch up marred surfaces to match adjacent finishes.
- F. Clean interior and exterior surfaces exposed to view; remove temporary labels, stains and foreign substances, clean and/or polish all transparent and glossy surfaces,
- G. Vacuum carpeted and soft surfaces.
- H. Remove waste and surplus materials, rubbish, and construction facilities from Site.
- I. Wash and shine mirrors.
- J. Ventilating systems:
 1. Clean permanent filters and replace disposable filters of units operated during construction; in addition, clean ducts, blowers, and coils when units have been operated without filters during construction.
 2. Clean ducts, blower, and coils of units operated during construction.
- K. Clean surfaces of equipment; remove excess lubrication.
- L. Clean plumbing fixtures to a sanitary condition

- M. Vacuum and wipe inside of electrical panels and cabinetwork.
- N. Clean light fixtures and lamps.
- O. Broom clean interior spaces.
- P. Clean, damp mop, wax and polish resilient and hard-surfaced floors as specified.
- Q. Remove waste, debris and surplus materials from site. Clean grounds; remove stains, spill, and foreign substances from paved areas and sweep clean. Rake clean other exterior surfaces.
- R. Use cleaning materials which will not create hazards to health or property or cause damage to the Work. Use cleaning materials and methods recommended by the manufacturers of the products to be cleaned.
- S. Contractor shall not use nor permitted to use any kind of material/cleaning chemical that are not permitted for use in the State of California, or not permitted by the Health Department
- T. Schedule operations to prevent dust and other contaminants resulting from cleaning operations from adhering to wet or newly finished surfaces.
- U. Clean roofs, gutters, downspouts and drainage systems.
- V. Interior surfaces and areas where Work is performed shall be left in vacuum clean condition with all dust, dirt, stains, hand marks, paint spots, plaster droppings, and other blemishes and defects completely removed. To the extent of Contractor's operations, use or materials, the following requirements apply to all areas where Work is performed:
 - 1. Walls: Bare and painted surfaces shall be cleaned and free of dust, lint, streaks, or stains.
 - 2. Hardware and metal surfaces shall be cleaned and polished using non-corrosive and non-abrasive materials.
 - 3. Glass: New glass and soiled existing glass shall be washed and polished both sides and left free of dirt and spots. Labels shall be removed.
 - 4. Ceilings shall be clean and free of stains, hand marks, and defacing.
 - 5. Fixtures and Equipment: New mechanical and electrical fixtures and like items shall be cleaned and polished. Lighting fixtures shall be free of dust, dirt, stains, or waste material. Equipment and machinery shall be cleaned, serviced, and ready for use. Existing items shall be cleaned as required including ventilating supply and return equipment in walls and ceilings.
 - 6. Surfaces not mentioned shall be cleaned according to the intent of this Section and as required for District's Representative's approval.

PART 2 – PRODUCTS

Not Used

PART 3 – EXECUTION

Not Used

END OF SECTION 01 74 00

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SECTION 01 74 01
Universal Waste Management

POLYCHLORINATED BIPHENYLS (PCBs)**LIGHT BALLAST HANDLING PROCEDURES**

The Contractor may be instructed to remove light fixtures which contain light ballasts during demolition activities specified in the contract documents. These light ballasts typically contain PCBs in the oil used as coolant and lubricant. Any ballast containing PCBs is to be considered a "Hazardous Waste", and the Contractor is responsible for ensuring personnel who perform PCBs related work (inspection, removal, clean-up) are trained and qualified to do so. All workers must also follow current OSHA regulations including 29 CFR 1910.120 and 8 CCR 5192, as well as other applicable federal, state and local laws and regulations.

PCBs Light Ballasts

All light ballasts manufactured through 1978 are magnetic ballasts which contain PCBs. Installation of ballasts manufactured prior to 1978 continued for several more years. As a result, it can be expected that any building constructed before 1980 which has not had a complete lighting retrofit is likely to have PCBs containing ballasts. Therefore, unless the ballast is electronic (this type is PCB free), determined by testing not to contain PCBs, or the manufacturers label on the ballast states "No PCBs", it is assumed all light ballasts on this site contain PCBs, and must therefore be handled as a hazardous waste by the Contractor. The Contractor may have other options for disposal of any light ballasts found not to contain PCBs.

Light Ballast Inspection

Contractor should disconnect all power and de-energize all electrical equipment to be impacted prior to performing inspection of electrical devices scheduled for removal or replacement. This de-energizing should be performed by or under the supervision of a licensed electrician. Contractor shall inspect each ballast prior to its removal to determine if the ballast is leaking if oily residue is present on the exterior of the ballast or the ballast has been damaged resulting in a leak. Upon discovering and prior to removal of any oil coated, leaking, or damaged ballast Contractor shall contact Owner's representative to discuss work procedures, waste requirements, etc.

Handling Work Practices of Undamaged Light Ballasts

Handling of ballasts shall be consistent with existing ballast conditions. While a ballast may not initially indicate any damage or leakage to be present, it may become damaged or begin to leak for any number of reasons during the removal and handling process. Any skin contact will probably constitute overexposure to PCBs since they are easily absorbed through the skin. It is recommended any personnel who will perform PCB related work should at a minimum wear protective clothing, including chemically resistant gloves, goggles, boots, and disposable coveralls.

Handling Work Practices of Damaged Light Ballasts

Handling of damaged ballasts shall be performed in a manner consistent with existing and current federal, state and local laws and regulations. Clean-up of spills, or contaminated surfaces will require the use of specifically trained and properly protected personnel utilizing state of the art, work practices, removal equipment, and materials. The Owners representative must be notified prior to the performance of this type of work.

PCBs Containing Waste

All PCBs containing light ballasts, removed by the Contractor, shall be placed in leak tight approved containers (metal barrels) until they are removed from the site by a waste transporter permitted to haul hazardous materials. Barrels must not be loaded in excess of their approved capacity. For most barrels this is 750 pounds. No other materials except, a sufficient amount of absorbent packing material, shall be included with the light ballasts.

The Contractor should contact their waste hauler prior to the start of work for information pertaining to recommendations or the waste haulers stated requirements for packing PCBs containing ballasts. However, at a minimum, the absorbent packing material should be added to the bottom of the waste barrel prior to the first ballast. Absorbent packing material should then be added intermittently as necessary to encase the ballasts as the waste barrel is being filled. When the waste barrel is filled, or no more light ballasts will be added, additional absorbent packing material should be added to completely cover the ballasts and the container then sealed.

Contractor is also responsible for appropriate labeling of waste barrels and securing of lids to meet federal and/or state requirements while being stored on the site.

All leaking or damaged ballasts must be handled in accordance with federal and state disposal requirements and shall be separated from undamaged ballasts in preparation for incineration at an appropriately licensed facility.

The Contractor is responsible for all costs associated with the removal, packing, loading, shipping, and disposal of each barrel of waste generated during this project. The Contractor is also responsible for obtaining and properly completing any Uniform Hazardous Waste Manifests needed for the disposal of PCBs waste. However, the Contractor shall not sign any Uniform Hazardous Waste Manifests for the Owner.

UNIVERSAL WASTE LAMP HANDLING PROCEDURES

The Contractor may be instructed to remove light fixtures which contain lamps which are designated as "Universal Waste" during demolition/renovation activities specified in the contract documents. If the Contractor is instructed to remove such fixtures the following handling procedures shall be followed.

Universal Wastes

Universal wastes are hazardous wastes that are more common and pose a lower risk to people and the environment than other hazardous wastes. Federal and State regulations identify universal wastes. The regulations, called the "Universal Waste Rule," are in the California Code of Regulations (CCR), title 22, division 4.5, chapter 23.

Universal Waste Lamps

Universal Waste Lamp, also referred to as "lamp" is defined as the bulb or tube portion of an electric lighting device. A lamp is specifically designed to produce radiant energy, most often in the ultraviolet, visible, and infra-red regions of the electromagnetic spectrum. Examples of common universal waste electric lamps include, but are not limited to, fluorescent, high intensity discharge, neon, mercury vapor, high pressure sodium, and metal halide lamps. Any lamp which is not spent and has been designated to be reused is not classified as a waste and does not meet the requirements of a hazardous waste or a universal waste.

Mercury-added lamps

Mercury-added lamps (effective February 9, 2004): Fluorescent tubes and several other types of lamps (not incandescent light bulbs) contain a small amount of mercury that is necessary for their operation. Currently, most fluorescent lamps contain enough mercury to be a hazardous waste.

Universal Waste Lamp Disposal

Spent lamps typically contain concentrations of mercury exceeding the established Total Threshold Limit Concentration and/or the Soluble Threshold Limit Concentration values. Therefore, these lamps must be sent to an authorized recycle facility, or to a universal waste consolidator for shipment to an authorized recycling facility.

At a minimum the lamps must be packaged in boxes/packages/containers which are structurally sound, adequate to prevent breakage, and compatible with the content of the lamps. These packages must remain closed and be free of damage which could cause leakage under reasonably foreseeable conditions.

Each container shall be labeled or marked clearly with one of the following phrases: "Universal Waste-Lamp(s)," or "Waste Lamp(s)." or "Used Lamp(s)".

Documentation in the form of a log, invoice, manifest, bill of lading or other shipping document is required to be submitted to HMS, Inc. for each shipment of waste from the project site. This documentation shall include name and address of generator and address of site waste is generated on, quantity of lamps to be shipped, date of shipment, name and address of hauler, and name and address of waste facility receiving the waste.

Hazardous Waste Designation

Any lamp which is not designated for recycling or continued use in a different fixture for which the lamp is manufactured for use in must be handled, managed, and disposed of as a hazardous waste in accordance with Cal/EPA Title 22. Since all spent lamps are required to be recycled the Owner will not approve of the disposal of lamps as hazardous without consultation and review of the specific circumstances which warrant this change in designation.

MERCURY SWITCHES

Thermostat switches that contain mercury are considered a hazardous waste if removed and disposed. Where the contract requires removal of thermostat switches, the contractor shall follow all requirements for packaging and disposal of these mercury containing wastes.

SMOKE DETECTORS WHICH MAY CONTAIN A RADIOACTIVE ELEMENT

The Contractor shall be responsible for the removal of all smoke detectors which may contain a radioactive element, which may be present in any building or corridor prior to the demolition of any building included in this project. These types of detectors are easily identified by reviewing the label which is usually found on the back of the detector. Older units may display the international radiation symbol (three bladed propeller) and the radioactive content. Newer units state the radioactive content and their Nuclear Regulatory Agency (NRC) license number.

The Contractor shall be responsible for contacting the manufacturer of any smoke detector with a radioactive element present to determine their return policies. The California Department of Toxic Substance Control (DTSC) has stated that it is a condition of the manufacturers NRC license that they

must accept returned units for disposal. The Contractor shall be responsible for all costs associated with removing, packaging, and shipping of the detectors in compliance with the manufacturers policies and procedures.

Contractor shall submit to the Owner a letter from the manufacturer which includes the number of units received, date received, and acceptance of the shipment for disposal by that manufacturer.

Additional Waste Management Requirements

The Contractor is responsible for managing lamps in a manner which prevents release of any universal waste or component of a universal waste to the environment. The Contractor is also responsible for the immediate cleanup of materials (mercury or other hazardous constituents) released by a lamp broken during removal or otherwise damaged while being handled into a container or containers designed to accommodate the resulting waste and its contents.

The Contractor is responsible for training employees in proper handling, packaging, storing, and labeling the universal waste, as well as, how to respond to releases (66273.13). This may be accomplished by providing employees written instructions or posting these instructions in the area where the universal waste lamps are being stored.

The Contractor is responsible for all costs associated with the removal, packing, loading, shipping, clean up and disposal of hazardous materials removed during this project, and any waste generated due to breakage during this project. The Contractor is also responsible for obtaining and properly completing any Uniform Hazardous Waste Manifests needed for the disposal of lamp waste. However, the Contractor shall not sign any Uniform Hazardous Waste Manifests for the Owner.

It shall be the responsibility of the Contractor to contact the Owner in advance of the scheduled pick-up time and date so the waste materials can be visually inspected for proper packing, and to have the Uniform Hazardous Waste Manifest properly signed by a Owner representative.



**SECTION 01 77 00
CLOSEOUT PROCEDURES**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. All Contract Documents shall be reviewed for applicable provisions related to the provisions in this document, and provisions in the General Conditions and other Division 1 Specification Sections shall apply to this Section without limitation.

1.2 RELATED REQUIREMENTS SPECIFIED IN OTHER SECTIONS

- A. Section 01 11 00 – “Summary of Work”
- B. Section 01 29 00 – “Payment Procedures”
- C. Section 01 32 13 – “Scheduling of Work”
- D. Section 01 32 33 – “Photographic Documentation”
- E. Section 01 33 00 – “Submittal Procedures”
- F. Section 01 41 00 – “Regulatory Requirements”
- G. Section 01 74 00 – “Cleaning and Waste Management”
- H. Section 01 73 00 – “Execution”
- I. Section 01 78 36 – “Warranties”
- J. Section 01 78 39 – “Project Record Documents”
- K. Divisions 2 through 41 Sections for Contract Closeout Procedure requirements for the work in those Sections

1.3 SUMMARY

- A. This section specifies administrative and procedural requirements for Contract closeout.

1.4 CONTRACT CLOSEOUT SUBMITTALS

- A. Color prints of full-size contractor marked-up Contract Drawings
- B. Color prints of full-size contractor marked-up Shop Drawings
- C. Professionally Drafted As-Built Record Drawings
- D. Dated, marked-up copies of Conformed Specifications
- E. Marked-up Project Data submittals
- F. Record Samples
- G. Field records for variable and concealed conditions
- H. Project Record Documents (See Section 01 78 39)
- I. Operating and maintenance manuals and data
- J. Warranties and bonds

- K. Warranty Management Plan
- L. Warranty Tags
- M. Spare Parts Data
- N. Service and maintenance contracts

1.5 REMOVAL OF TEMPORARY CONSTRUCTION FACILITIES

- A. Remove temporary materials, equipment, services, and construction prior to Initial Inspection, unless otherwise noted in other Contract Documents for a removal period subsequent to Initial Inspection but prior to Final Completion
- B. Comply with requirements of Section 01 50 00, Temporary Facilities and Controls

1.6 INITIAL PUNCH LIST AND INSPECTION

- A. When Contractor considers Work to be Substantially Complete, submit written notice to District’s Representative requesting an Initial Inspection and listing items remaining to be completed or corrected listed by room number and item number (hereinafter “Initial Punch List”). The Contractor and/or its Subcontractors shall proceed promptly to complete and correct items on the list without waiting for District review of the Initial Punch List and inspection of the Work. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.
- B. In a separate section of the Initial Punch List, include all items which cannot be completed or verified prior to Functional Performance Testing of the entire Work in accordance with Specification Section [*Pending Addendum - General Commissioning Requirements*] and other technical Specifications.
 - 1. The Contractor shall provide the expertise, trades subcontractors, manufacturers’ representatives, or others as required to work collaboratively with the District and its representatives to identify all remaining items of Work, including required testing and verification, which cannot be completed or verified prior to Functional Performance Testing of the entire Work in accordance with Specification Section [*Pending Addendum - General Commissioning*].
 - 2. The Initial Punch List items identified to remain for subsequent completion shall not be significant enough to prevent beneficial occupancy and full use of the Work by the District.
- C. The Contractor shall not submit a notice requesting an Initial Inspection unless the Work is Substantially Complete.
- D. Should District’s Representatives determine that Work is not Substantially Complete, the District will promptly notify Contractor in writing, listing Work that must be completed prior to Substantial Completion. Any inspection list that is submitted to the District that does not result in a District determination of Substantial Completion will not be considered an accepted Initial Punch List. If the Work is determined to not be Substantially Complete, Contractor shall complete all Work as directed prior to requesting an additional Initial Inspection by the District to determine Substantial Completion per this Specification Section.
- E. Upon receipt of the Contractor’s Initial Punch List, and not before, the District, Architect, and Project Inspector will make an Initial Inspection to determine whether the Work, is Substantially Complete.

1. All fire and life safety items, manufactured units, equipment and systems that require startup must have been started, run, tested, and operational for periods prescribed by the Contract Documents before a request for Initial Inspection is accepted by the District.
 2. All items not completed in accordance with the requirements of the Contract Documents whether identified by the Contractor, District, Architect, Project Inspector, and/or other District Representatives as a result of the Initial Inspection shall be incorporated by the Contractor into a draft Pre-final Punch List which shall be submitted for District review and revision in accordance with Specification Section 01330, Submittal Procedures, prior to a determination by the District of Substantial Completion.
 3. If additional Initial Inspections are required to review Initial Punch List items due to incompleteness of the Work by Contractor, Contractor will reimburse District for all costs associated with these inspections if additional service fees by District consultants are required. The costs of such District additional service fees will be deducted from the Contract Price by Change Order.
- F. District may enlist Consultants to assist with the above activities.

1.7 SUBSTANTIAL COMPLETION

- A. When District determines that the Work is Substantially Complete, District will issue a Certificate of Substantial Completion, accompanied by a Pre-Final Punch List of items to be completed or corrected as verified and/or appended by Architect and District.
- B. When the Work, is Substantially Complete, the District will file a Notice of Completion.
 1. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work, unless otherwise provided in the Notice of Completion.
 2. The Notice of Completion shall be submitted to the Contractor for their written acceptance of responsibilities assigned to them in such Notice prior to District filing the Notice of Completion for purposes of initiating the release of Retention for the Work. The District shall withhold from Contractor payment the value of remaining Work, Work to be corrected, incomplete Work, and an amount identified for Pre-Final Punch List Work, and as otherwise identified in Public Contract Code.
- C. The Contractor shall complete the items listed in the Pre-Final Punch List within ten (10) working days of the Certificate of Substantial Completion, with the exception of the items that must remain incomplete pending final commissioning. The Contractor shall execute the Work such that the District can occupy the Work within seven (7) calendar days of the date of the Certificate of Substantial Completion.

1.8 PRE-FINAL INSPECTION

- A. When Contractor considers the items listed in the Pre-Final Punch List to be complete, with the exception of items which cannot be completed or verified prior to Functional Performance Testing of the entire Work in accordance with Specification Section 01 91 13, General Commissioning, and other specification sections, the Contractor shall submit written notice to District’s Representative requesting a Pre-Final Inspection.
- B. Upon receipt of the Contractor’s request for Pre-Final Inspection, and not before, the District, Architect, Campus Representatives, and Project Inspector will inspect the Work to determine whether the Work identified on the Pre-Final Punch List is complete, with the exception of items

which cannot be completed or verified prior to Functional Performance Testing of the entire Work in accordance with Specification Section 01 91 13, General Commissioning and other specification sections.

- C. Prior to the Pre-Final Inspection, perform final cleaning of the Work, as specified in Section 01 74 23.
1. Inspection Requirements.
 - a. Before calling for Pre-Final Inspection, Contractor shall determine that the following Work has been performed:
 - i) The Work has been completed.
 - ii) All life safety items are completed and in working order.
 - iii) All mechanical and electrical Work complete, fixtures in place, connected and ready for tryout and test.
 - iv) Electrical circuits scheduled in panels and disconnect switches labeled.
 - v) Painting and special finishes are complete.
 - vi) Doors complete with hardware, cleaned of protective film, are relieved of sticking or binding and in working order.
 - vii) Tops and bottoms of doors sealed.
 - viii) Floors waxed and polished as specified.
 - ix) Broken glass replaced and glass cleaned.
 - x) Grounds cleared of Contractor's equipment, raked clean of debris, and trash removed from Site.
 - xi) Work cleaned, free of stains, scratches, and other foreign matter, and damaged and broken material have been replaced.
 - xii) Finishes and decorative work shall have marks, dirt and superfluous labels removed.
 - xiii) All other requirements per the Contract Documents.
 - b. Furnish a letter to District stating that a responsible representative of District [give name and position] has been instructed in working characteristics of mechanical and electrical systems and equipment. See Specification Section 01 79 00, Demonstration and Training.
 2. All items not completed in accordance with the requirements of the Contract Documents whether identified by the Contractor, District, Architect, , Project Inspector, and/or other District Representatives as a result of the Pre-Final Inspection, shall be incorporated by the Contractor into a draft Final Punch List which shall be submitted for District review and revision in accordance with Specification Section 01 33 00, Submittal Procedures, prior to a determination by the District that the Contract is ready for administrative close-out.
 3. If additional Pre-final Inspections are required to review the Pre-final Punch List items due to incompleteness of the Work by Contractor, Contractor will reimburse District for all costs associated with these inspections if additional services fees by District consultants are required. The costs of such District additional service fees will be deducted from the Contract Price by Change Order.

1.9 FINAL INSPECTION

- A. When Contractor considers the items listed in the Final Punch List to be complete the Contractor shall submit written notice to District’s Representative requesting a Final Inspection.
- B. Upon receipt of the Contractor’s request for Final Inspection, and not before, the Contractor, District, Architect, and Project Inspector, shall meet to go over the Contract Documents to identify the administrative requirements for contract close-out.
 - 1. The District will prepare a list of requirements remaining for administrative close-out and shall provide the list to the Contractor.
 - 2. The Contractor shall complete all items on the administrative close-out list within thirty (30) days.
- C. Subsequent to the meeting to identify administrative close-out requirements, District, Architect, Campus Representatives, and Project Inspector will inspect the Work to determine whether the Work identified on the Final Punch List is complete.
- D. If additional Final Inspections are required to review the Final Punch List items due to incompleteness of the Work by Contractor, Contractor will reimburse District for all costs associated with these inspections if additional services fees by District consultants are required. The costs of such District additional service fees will be deducted from the Contract Price by Change Order.
- E. When the Architect determines that all final punch list items have been completed, a final Project Inspection Report will be issued. Any open administrative close-out requirements will be identified and a value for withholding from Progress Payment or Final Payment will be assigned.
- F. The Project Inspector (IOR), the District Representative, and the Contractor shall, at all times, be together during all inspections. The Contractor shall give 24-hour notice to the District for such inspections.

1.10 FINAL COMPLETION

- A. Final Completion occurs when all Work meets all requirements of the Contract Documents. When Contractor considers all Work complete and all close-out requirements have been performed, submitted, and accepted, submit written certification to District that:
 - 1. Contractor has inspected Work for compliance with Contract Documents, and all requirements for Final Completion have been met.
 - 2. Except for Contractor maintenance and Deferred or Seasonal Testing, after Final Completion, all Work has been completed in accordance with Contract Documents and deficiencies listed with any Certificate of Substantial Completion have been corrected. Equipment and systems have been tested in the presence of Architect, Project Inspector (IOR), and District Representatives and are operative.
- B. Should District determine that the Work is incomplete or defective or that administrative requirements have not been completed:
 - 1. District’s Representative will promptly so notify Contractor, in writing, listing the incomplete or defective items.
 - 2. Contractor shall promptly remedy all incomplete and/or defective Work and notify the District when it is ready for re-inspection. District’s Representatives will then re-inspect the

Work. If deficiencies previously noted are found not to be corrected, Contractor shall pay all District costs for the re-inspection.

3. When District determines that all Work and requirements are complete under the Contract Documents, District will request Contractor to make a request for Final Payment.

1.11 FINAL ADJUSTMENTS OF ACCOUNTS

- A. Submit a final statement of accounting to District, showing all adjustments to the Contract Price. See also Section 01 29 00 Payment Procedures, Final Payment, et al.
- B. If required, District shall prepare a final Change Order showing an adjustment to the Contract Price that was not included in previous Change Orders.

1.12 FINAL CLEANING

Contractor shall comply with all applicable requirements in Section 01 74 00, Final Cleaning Requirements.

1.13 PROJECT RECORD DOCUMENTS

Contractor shall comply with all applicable requirements in Section 01 78 39, Project Record Documents.

1.14 PROJECT WARRANTY

- A. Requirements for Contractor’s Warranty of completed Work are included in the General Conditions and Section 01 78 36, Warranties.
- B. Recording of Final Completion, final certificate for payment, or partial or entire occupancy of the Work by District shall not constitute acceptance of Work not done in accordance with Contract Documents, and do not relieve the Contractor of liability in respect to express warranties, latent defects, or responsibility for faulty materials or workmanship.
- C. District may make repairs to defective Work as set forth in Contract General Conditions.
- D. If, after installation, operation, or use of materials or equipment to be provided under Contract proves to be unsatisfactory to District, District shall have right to operate and use materials or equipment until said materials and equipment can, without damage to District, be taken out of service for correction or replacement. Period of use of defective materials or equipment pending correction or replacement shall in no way decrease guarantee period required for acceptable corrected or replaced items of materials or equipment.
- E. Nothing in this Section shall be construed to limit, relieve, or release Contractor’s, subcontractors’, and equipment suppliers’ liability to District for damages sustained as result of latent defects in equipment caused by negligence of suppliers’ agents, employees, or subcontractors. Stated in another manner, warranty contained in the Contract Documents shall not amount to, nor shall it be deemed to be, waiver by District of any rights or remedies (or time limits in which to enforce such rights or remedies) it may have for defective workmanship or defective materials under laws of this state pertaining to acts of negligence.

1.15 WARRANTIES

- A. Execute Contractor’s submittals and assemble warranty documents as described in Section 01 33 00 Submittal Procedures and Section 01 78 36 Warranties.

1.16 RETURN OF DISTRICT KEYS, PARKING PERMITS AND IDENTIFICATION

Contract Documents will not be closed out and final payment will not be made until all personnel identification media, vehicle permits, and keys issued to Contractor during prosecution of Work are returned to the District Representative.

1.17 RELEASE OF CLAIMS

- A. Contract Documents will not be closed out and final payment will not be made until Agreement and Release of Any and All Claims is completed and executed by Contractor and District.

1.18 FIRE INSPECTION COORDINATION

- A. Coordinate required fire inspection(s) with governing agencies having jurisdiction and provide sufficient notice to District to permit convenient scheduling (if applicable.)

1.19 BUILDING INSPECTION COORDINATION

- A. Coordinate with District, Architect, and Project Inspector final inspection for the purpose of obtaining any occupancy certificate (if applicable.)

1.20 MAINTENANCE OF DOCUMENTS AND SAMPLES

- A. Store Project Record Documents and samples in the Contractor’s field office apart from Contract Documents used for construction.
- B. Do not permit Project Record Documents to be used for construction purposes.
- C. Maintain Project Record Documents in good order, and in a clean, dry, legible condition.
- D. Make documents and samples available for weekly inspections by District, Architect, and Project Inspector.

1.21 RECORD CONSTRUCTION SCHEDULE

- A. Using the latest progress schedule required by Section 01 33 00, Submittal Procedures as a reference, submit a Record Baseline CPM Schedule showing the actual dates and duration of all construction activities.
- B. Sign and date the completed Record Baseline CPM Schedule and deliver to the District prior to Final Completion.

1.22 PROJECT RECORD DRAWINGS

- A. Comply with requirements of Section 01 78 39, Project Record Documents.

1.23 PROJECT RECORD SPECIFICATIONS

- A. Comply with requirements of Section 01 78 39 Project Record Documents.

1.24 PRODUCT DATA

- A. Comply with requirements of Section 01 78 39, Project Record Documents.

1.25 OPERATION TESTS

- A. Conduct operational tests as required to demonstrate that all systems have been completed and are in compliance with all requirements.

- B. Furnish a written record of test results using recording type instruments where applicable and as directed.

1.26 OPERATION AND MAINTENANCE MANUALS

- A. Comply with requirements of Section 01 78 39, Project Record Documents.

1.27 MATERIALS, EQUIPMENT AND FINISHES MANUAL

- A. Comply with requirements of Section 01 78 39, Project Record Documents.

1.28 SERVICE AND MAINTENANCE CONTRACTS

- A. Compile, review, and submit specified service and maintenance contracts as specified for warranties and bonds.

1.29 MISCELLANEOUS PROJECT RECORD SUBMITTALS

- A. Refer to other specification sections for miscellaneous record keeping requirements and submittals. Immediately prior to Final Completion, complete miscellaneous records and place them in good order, properly identified and bound or filed, ready for District use and reference. Submit to the Architect for review and approval.
 - 1. Miscellaneous records include, but are not limited to the following:
 - a. Authorized measurements utilizing unit prices
 - b. Records of plant treatment
 - c. Certifications received in lieu of labels on bulk products
 - d. Batch mixing and bulk delivery records
 - e. Testing and qualification of tradespersons
 - f. Installation firm's qualification documents
 - g. Load and performance testing
 - h. Inspections and certifications by governing authorities
 - i. Leakage and water-penetration tests
 - j. Fire resistance and flame spread test results
 - k. Final inspection and correction procedures

1.30 EXTRA MATERIALS

- A. Where specified, provide extra materials in the quantities and manner specified.
- B. Delivery and certification of extra materials shall be prerequisite to Substantial Completion.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

Not Used.

END OF SECTION 01 77 00

**SECTION 01 78 23
OPERATION AND MAINTENANCE DATA**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. All Contract Documents shall be reviewed for applicable provisions related to the provisions in this document, and provisions in the General Conditions and other Division 1 Specification Sections shall apply to this Section without limitation.

1.2 RELATED REQUIREMENTS SPECIFIED IN OTHER SECTIONS

- A. Section 01 11 00 – “Summary of Work”
- B. Section 01 32 13 – “Scheduling of Work”
- C. Section 01 31 00 – “Project Management and Coordination”
- D. Section 01 33 00 – “Submittal Procedures”
- E. Section 01 78 36 – “Warranties”
- F. Section 01 77 00 – “Closeout Procedures”
- G. Section 01 78 39 – “Project Record Documents”
- H. Divisions 2 through 41 Sections for Operation and Maintenance Data requirements for the work in those Sections.

1.3 SUMMARY

- A. This section includes administrative and procedural requirements for Operation and Maintenance (O&M) data and documents.

1.4 FORMAT

- A. Contractor shall compile O&M manuals for all building equipment including mechanical, plumbing and electrical equipment, commissioned or not, in the following formats:
 - 1. Quantity: as specified in Section 01 33 00, Submittal Procedures.
 - 2. Hard Media Format:
 - a. Size: 8 ½ x 11-inch, 3-ring loose-leaf binders. Use as many binders as required for each element as listed below. Do not overload binders.
 - b. Binding: Bind in stiff, metal-hinged, three-ring binder(s) with standard 3 hole-punching. Binders shall be 3-inch maximum. Use white or black colored binders with integrated clear plastic covers to enable insertion of binder titles.
 - c. Sheet lifters: Provide plastic sheet lifters prior to first page and following last page.
 - d. Binder titles: Include the following title on front and spine of binder:

**REDWOODS COMMUNITY COLLEGE DISTRICT
Campus Number and Name
O&M Manual for: (insert equipment description(s) included)**

3. Drawing Size: Provide reduced size drawings or diagrams to fit in binder. Where reduction is not practical to ensure readability, fold larger drawings separately and place in vinyl envelopes bound into the binder. Identify vinyl envelopes with drawing numbers.
 4. Dividers: Use dividers with permanently marked tabs of card stock to separate each section and sub section. Tab labels shall not be handwritten. Use a main tab for each specification section. Behind the section number tab there shall be the equipment ID tab sub-tab for each piece of major equipment (or group, if small or numerous). These sub-tabs shall be similar to the specification number tabs but of a different color.
- B. Submit O&M Data specifically applicable to this Contract and a complete and concise depiction of the provided equipment, product, or system, stressing and enhancing the importance of system interactions, troubleshooting, and long-term preventative maintenance and operation. The subcontractors shall compile and prepare data and deliver to the Contractor prior to the training of District personnel. The Contractor shall compile and prepare aggregate O&M data including clarifying and updating the original sequences of operation to as-built conditions. Organize and present information in sufficient detail to clearly explain O&M requirements at the system, equipment, component, and subassembly level. Include an index preceding each submittal. Submit in accordance with this section and Section 01 33 00 SUBMITTAL PROCEDURES.
1. Package Quality. Documents must be fully legible. Poor quality copies and material with hole punches obliterating the text or drawings will not be accepted.
 2. Package Content. Data package content shall be as shown in the paragraph titled "Schedule of Operation and Maintenance Data Packages." Comply with the data package requirements specified in the individual technical sections, including the content of the packages and addressing each product, component, and system designated for data package submission.
 3. Changes to Submittals. Manufacturer-originated changes or revisions to submitted data shall be furnished by the Contractor if a component of an item is so affected subsequent to acceptance of the O&M Data. Changes, additions, or revisions required by the Architect or District Project Manager for final acceptance of submitted data, shall be submitted by the Contractor within 30 calendar days of the notification of this change requirement.
 4. Review and Approval. The District's Commissioning Authority (CA) shall review the commissioned systems and equipment submittals for completeness and applicability. The CA shall verify that the systems and equipment provided meet the requirements of the Contract documents and design intent, particularly as they relate to functionality, energy performance, water performance, maintainability, sustainability, system cost, indoor environmental quality, and local environmental impacts. The CA shall communicate deficiencies to the District and Architect. Upon a successful review of the corrections, the CA shall recommend approval and acceptance of these O&M manuals to the District and Architect. This work shall be in addition to the normal review procedures for O&M data.

1.5 ELECTRONIC MEDIA FORMAT

- A. Electronic Media Format: Electronic media format shall be Adobe PDF, with chapter markers and/or bookmarks inserted in place of the equivalent hard copy section tabs. Electronic copy shall include all tables, charts, drawings, codes and all other matters reflected in hard copies. Electronic media files shall be delivered on a unique USB data stick, and/or to the College's Procore account if applicable.

1.6 SYSTEMS COVERED

- A. The Contractor shall supply the required information for all systems identified in the technical specification sections and in this section. A separate manual or chapter shall be provided for each applicable system as follows:
1. Chillers
 2. Cooling Towers
 3. Boilers
 4. Pumps
 5. Air Handling Units (include sequence of operation, one line diagram and area served in a plastic pouch for mounting on equipment or in equipment room)
 6. Exhaust fans
 7. Supply Air Fans (excluding Air Handling Units)
 8. Plumbing and drainage Systems/Equipment
 9. Emergency Generator Systems
 10. UPS
 11. Fire Protection Systems
 12. Fire Alarm System
 13. Valves and Pipe Specialties (include valve identification chart)
 14. Variable Frequency Drives (VFD)
 15. Smoke Control Systems
 16. Water Treatment Systems
 17. Elevator Systems
 18. Lighting Systems and Controls (interior, exterior and airfield)
 19. Switchgear, Transformers, Panel boards, Motor Control Centers and Motor Starters
 20. Lighting Protection and Surge Suppression Systems
 21. Public Address, Closed Circuit TV, Communication and Telephone Systems
 22. Security System
 23. Building Management/Temperature Control System (BMS)
 24. Fuel System
 25. Doors and Hardware
 26. Power monitoring systems
 27. HVAC, Testing Adjusting and Balancing.

1.7 COMPUTER PROGRAMS

- A. When any equipment requires operation by computer programs, submit copy of original program on CD or USB Data Stick, with a hard-copy and an electronic copy (Adobe PDF format) of all user manuals and guides for operating the programs. Program shall be Windows compatible. Provide required licenses to District at no additional cost.

1.8 TYPES OF INFORMATION REQUIRED IN O&M DATA PACKAGES

- A. Title Page, which shall be duplicate of front binder title
- B. Table of Contents with section numbers
- C. Equipment Sections and Sub Sections
 - 1. The first page behind the equipment tab shall be the Contractor 's name, address and telephone number of the manufacturer and installing contractor and the 24-hour number for emergency service for all equipment in this section, identified by equipment.
 - 2. Submittal and Product Data: This section shall include all approved submittal data, cut sheets, data base sheets and appropriate shop drawings. If submittal was not required for approval, descriptive product data shall be included.
 - 3. O & M and installation instructions that were shipped with the unit.
 - 4. Model number, serial number and nameplate data for each piece of equipment and any subcomponent.
 - 5. Safety Precautions. List personnel hazards and equipment or product safety precautions for all operating conditions.
 - 6. Operating Instructions. These shall be the written manufacturer's data with the model and features of this installation clearly marked and edited to omit reference to products or data not applicable to this installation. This section shall include data on the following:
 - a. Include specific instructions, procedures, and illustrations for the following phases of operation for the installed model and features of each system:
 - i) Operator Prestart and Startup Procedures. Include step-by-step procedures, including a pre-start checklist if applicable, required to install, set up, prepare, and startup each system for use.
 - ii) Startup, Shutdown, and Post-Shutdown Procedures. Provide narrative description for Startup, Shutdown and Post-shutdown operating procedures including the control sequence for each procedure.
 - iii) Sequence of operations, with detailed instruction in proper sequence, for each mode of operation (i.e. day-night; staging of equipment.)
 - iv) Normal Operations. Provide narrative description of Normal Operating Procedures. Include Control Diagrams with data to explain operation and control of systems and specific equipment.
 - v) Emergency Operations. Include Emergency Procedures for equipment malfunctions to permit a short period of continued operation or to shut down the equipment to prevent further damage to systems and equipment. Include Emergency Shutdown Instructions for fire, explosion, spills, or other foreseeable contingencies. Provide guidance and procedures for emergency operation of all utility systems including required valve positions, valve locations and zones or portions of systems controlled. If some functions of the equipment can be operated while other functions are disabled, give instructions for operations under these conditions. Include here only those alternate methods of operations (from normal) which the operator can follow when there is a partial failure of malfunctioning of components, or other unusual condition.

- vi) Shutdown procedure: Include instructions for stopping and securing the equipment after operation. If a particular sequence is required, give step-by-step instructions in that order.
 - vii) Refer to controls and indicators by nomenclature consistent with that used on panels and in control diagrams.
- b. Operator Service Requirements. Include instructions for services to be performed by the operator such as lubrication, adjustment, inspection, and recording gage readings.
 - c. Environmental Conditions. Include a list of Environmental Conditions (temperature, humidity, and other relevant data) that are best suited for the operation of each product, component or system. Describe conditions under which the item equipment should not be allowed to run.
- D. Preventive Maintenance. Include manufacturer's schedule for routine preventive maintenance, inspections, tests and adjustments required to ensure proper and economical operation and to minimize corrective maintenance. Provide manufacturer's projection of preventive maintenance work-hours on a daily, weekly, monthly, and annual basis including craft requirements by type of craft. For periodic calibrations, provide manufacturer's specified frequency and procedures for each separate operation. Include potential environmental and indoor air quality impacts of recommended maintenance procedures and materials.
1. Produce a schedule for preventive maintenance in a printed format and an electronic format compatible with District's system. State, preferably in tabular form, the recommended frequency of performance for each preventive maintenance task, cleaning, inspection and scheduled overhauls.
 2. Cleaning: Provide instructions and schedules for all routine cleaning and inspection with recommended lubricants.
 3. Inspection: If periodic inspection of equipment is required for operation, cleaning or other reasons, indicate the items to be inspected and give the inspection criteria for: motors; controls; filters and any other maintenance items.
 4. Provide instructions for minor repairs or adjustments required for preventive maintenance routines. Identify test points and give values for each. Include sensor calibration requirements and methods by sensor type.
 5. Corrective maintenance instructions shall be predicated upon a logical effect-to-cause troubleshooting philosophy and a rapid replacement procedure to minimize equipment downtime.
 6. Troubleshooting: Troubleshooting tables, charts, or diagrams shall be used to present specified procedures. A guide to this type shall be a three-column chart. The columns shall be titled: Malfunction, Probable Cause and Recommended Action.
 7. Repair and replacement: Indicate repair and replacement procedures most likely to be required in the maintenance of the equipment.
 8. A list of recommended spare parts with a price list and a list of spare parts provided under this Contract.
 9. Outline, cross-section, and assembly drawings; engineering data; and electrical diagrams, including elementary diagrams, labeled wiring diagrams, connection diagrams, word description of wiring diagrams and interconnection diagrams.

10. Lubrication Data. Include preventative maintenance lubrication data, in addition to instructions for lubrication provided under paragraph titled "Operator Service Requirements":
 - a. A table showing recommended lubricants for specific temperature ranges and applications.
 - b. Charts with a schematic diagram of the equipment showing lubrication points, recommended types and grades of lubricants, and capacities.
 - c. A Lubrication Schedule showing service interval frequency.
- E. Corrective Maintenance (Repair). Include manufacturer's recommended procedures and instructions for correcting problems and making repairs for the installed model and features of each system. Include potential environmental and indoor air quality impacts of recommended maintenance procedures and materials.
 1. Troubleshooting Guides and Diagnostic Techniques. Include step-by-step procedures to promptly isolate the cause of typical malfunctions. Describe clearly why the checkout is performed and what conditions are to be sought. Identify tests or inspections and test equipment required to determine whether parts and equipment may be reused or require replacement.
 2. Wiring Diagrams and Control Diagrams. Wiring diagrams and control diagrams shall be point-to-point drawings of wiring and control circuits including factory-field interfaces. Provide a complete and accurate depiction of the actual job specific wiring and control work. On diagrams, number electrical and electronic wiring and pneumatic control tubing and the terminals for each type, identically to actual installation configuration and numbering.
 3. Maintenance and Repair Procedures. Include instructions and a list of tools required to repair or restore the product or equipment to proper condition or operating standards.
 4. Removal and Replacement Instructions. Include step-by-step procedures and a list required tools and supplies for removal, replacement, disassembly, and assembly of components, assemblies, subassemblies, accessories, and attachments. Provide tolerances, dimensions, settings and adjustments required. Instructions shall include a combination of text and illustrations.
 5. Spare Parts and Supply Lists. Include lists of spare parts and supplies required for maintenance and repair to ensure continued service or operation without unreasonable delays. List spare parts and supplies that have a long lead-time to obtain.
- F. Appendices. Provide information required below and information not specified in the preceding paragraphs but pertinent to the maintenance or operation of the product or equipment. Include the following:
 1. Specifications. Copy and insert the record Project Specification section in the manual.
 2. Product Submittal Data. Provide a copy of all SD-03 Product Data submittals required in the applicable technical sections.
 3. Manufacturer's Instructions. Provide a copy of all Manufacturers' Instructions submittals required in the applicable technical sections.
 4. O&M Submittal Data. Provide a copy of all Operation and Maintenance Data submittals required in the applicable technical sections.
 5. Parts Identification. Provide identification and coverage for all parts of each component, assembly, subassembly, and accessory of the end items subject to replacement. Include

special hardware requirements, such as requirement to use high-strength bolts and nuts. Identify parts by make, model, serial number, and source of supply to allow reordering without further identification. Provide clear and legible illustrations, drawings, and exploded views to enable easy identification of the items. When illustrations omit the part numbers and description, both the illustrations and separate listing shall show the index, reference, or key number that will cross-reference the illustrated part to the listed part. Parts shown in the listings shall be grouped by components, assemblies, and subassemblies in accordance with the manufacturer's standard practice. Parts data may cover more than one model or series of equipment, components, assemblies, subassemblies, attachments, or accessories, such as typically shown in a master parts catalog.

6. **Warranty Information.** List and explain the various warranties and clearly identify the servicing and technical precautions prescribed by the manufacturers or contract documents in order to keep warranties in force. Include warranty information for primary components such as the compressor of air conditioning system.
7. **Personnel Training Requirements.** Provide information available from the manufacturers that are needed for use in training designated personnel to properly operate and maintain the equipment and systems.
8. **Testing Equipment and Special Tool Information.** Include information on test equipment required to perform specified tests and on special tools needed for the operation, maintenance, and repair of components.
9. **Testing and Performance Data.** Include completed pre-functional checklists, functional performance test forms, and monitoring reports. Include recommended schedule for retesting and blank test forms.
10. **Contractor Information.** Provide a list that includes the name, address, and telephone number of the Contractor and each Subcontractor who installed the product or equipment, or system. For each item, also provide the name address and telephone number of the manufacturer's representative and service organization that can provide replacements most convenient to the project site. Provide the name, address, and telephone number of the product, equipment, and system manufacturers.

1.9 TYPES OF INFORMATION REQUIRED IN CONTROLS O&M DATA PACKAGES

- A. Include all requirements found in the technical specifications, items in the Schedule of O&M Data Packages, and the following for control systems:

Narrative description on how to perform and apply all functions, features, modes, and other operations, including unoccupied operation, seasonal changeover, manual operation, and alarms. Include detailed technical manual for programming and customizing control loops and algorithms.

1. Full as-built sequence of operations
2. Copies of all checkout tests and calibrations performed by the Contractor (not Cx tests).
3. Full points list. A listing of rooms shall be provided with the following information for each room:
 - a. Floor
 - b. Room number
 - c. Room name
 - d. Air handler unit ID

- e. Reference drawing number
 - f. Air terminal unit tag ID
 - g. Heating and/or cooling valve tag ID
 - h. Minimum cfm
 - i. Maximum cfm
4. Full print out of all schedules and set points after testing and acceptance of the system.]
 5. Full as-built print out of software program.]
 6. Electronic copy on disk or CD of the entire program for this facility.]
 7. Marking of all system sensors and thermostats on the as-built floor plan and mechanical drawings with their control system designations.

1.10 SUPPLEMENTAL DATA

- A. Contractor shall prepare written text and/or special drawings to provide necessary information when manufacturer's standard printed data is not available and/or additional information is necessary for a proper understanding and operation and maintenance of equipment or systems, or when it is necessary to supplement data included in the manual or Project documents.

1.11 SCHEDULE OF INFORMATION FOR OPERATION AND MAINTENANCE DATA PACKAGES

- A. Supply all of the following, when and where applicable, for each O&M data package:
 1. Safety precautions
 2. Operator prestart
 3. Startup, shutdown, and post-shutdown procedures
 4. Normal operations
 5. Emergency operations
 6. Operator service requirements
 7. Environmental conditions
 8. Lubrication data
 9. Preventive maintenance plan and schedule
 10. Cleaning recommendations
 11. Troubleshooting guides and diagnostic techniques
 12. Wiring diagrams and control diagrams
 13. Maintenance and repair procedures
 14. Removal and replacement instructions
 15. Spare parts and supply list
 16. Special tools required to service or maintain the equipment
 17. Corrective maintenance man-hours
 18. Product submittal data
 19. O&M submittal data
 20. Parts identification
 21. Warranty information

22. Personnel training requirements
23. Testing equipment and special tool information
24. Testing and performance data
25. Installing Subcontractor information

PART 2 – PRODUCTS

Not Used.

PART 3 – EXECUTION

Not Used.

END OF SECTION 01 78 23

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SECTION 01 78 36

WARRANTIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. All Contract Documents shall be reviewed for applicable provisions related to the provisions in this document, and provisions in the General Conditions and other Division 1 Specification Sections shall apply to this Section without limitation.

1.2 RELATED DOCUMENTS SPECIFIED IN OTHER SECTIONS

- A. Section 01 11 00 – “Summary of Work”
- B. Section 01 77 00 – “Closeout Procedures”
- C. Section 01 78 39 – “Project Record Documents”
- D. Section 01 79 00 – “Demonstration and Training Procedures”
- E. Divisions 2 through 41 Sections for Warranties/Guaranties requirements for the Work in those Sections.

1.3 SUMMARY OF WORK

- A. Contractor hereby warrants and guaranties to District all Work performed on this Project, including all material and equipment incorporated therein, as set forth below:
- B. Pursuant to the requirements of this Section and other sections of the Contract Documents, Contractor agrees to unconditionally warranty and guaranty the quality and adequacy of all of Work provided under this Contract including, without limitation, all labor, materials and equipment provided by the Contractor and Subcontractors of all tiers in connection with the Work.
- C. Contractor’s Warranty and/or Guaranty shall become effective on the first day following District’s issuance of a written Notice of Substantial Completion or on such other date as may be specified elsewhere in the Contract Documents, and once effective, the Warranties and/or Guaranties shall remain operative and shall bind Contractor as further described herein for a period of one (1) year, and/or more as specified in the Contract Documents.
- D. All Contractor Warranties and/or Guaranties must be reviewed and accepted by District.
- E. Neither final payment nor use or occupancy of the Work performed by the Contractor shall constitute an acceptance of Work not done in accordance with Contract Documents, nor relieve Contractor of liability in respect to any express warranties and/or guaranties or responsibilities for faulty materials or workmanship.
- F. Contractor shall remedy any defects in the Work and repair any associated damage resulting therefrom, and pay all costs for any such Work which shall become evident within any Project Warranty and/or Guaranty period. If any Work is found to be defective within any Project

Warranty and/or Guaranty period, Contractor shall, without cost to District, promptly correct such defective Work.

- G. Contractor shall remove any defective Work rejected by District and replace it with Work that complies in all respects to the requirements of the Contract Documents. Remove and replace any damage to other Work or the Work of others resulting therefrom.
- H. If Contractor fails to promptly comply with the terms of such instructions, or in an emergency where delay would cause serious risk of loss or damage, District may have the defective Work corrected or the rejected Work removed and replaced. Contractor shall pay for all costs, losses and damages caused by or resulting from such removal and replacement within the Warranty and/or Guaranty period.
- I. Where Contractor fails to correct defective Work, or defects are discovered outside the Warranty and/or Guaranty period, District shall have all rights and remedies granted by law.
- J. Inspection of the Work shall not relieve Contractor of any of its obligations under the Contract Documents. Even though equipment, materials, or Work required to be provided under the Contract Documents have been inspected, accepted, and paid for, Contractor shall, at its own expense, replace or repair any such equipment, material, or Work found to be defective or otherwise not to comply with the requirements of the Contract Documents up to the end of the guaranty period.
- K. These Warranties and/or Guaranties are in addition to any other warranty or guaranty requirements contained in the Contract Documents, and not in lieu of any other liability imposed on Contractor under the Contract Documents and governing laws with respect to Contractor's duties, obligations, and performance under the Contract Documents.

1.4 FORMAT

- A. Contractor shall separate each warranty and/or guaranty with index tab sheets keyed to a Table of Contents listing, providing full information and using separate typed sheets as necessary. Contractor shall list each applicable and/or responsible subcontractor, supplier, and/or manufacturer, with name, address, telephone number, fax number, and e-mail of each responsible principal.
 - 1. Bind warranties and guaranties and bonds in heavy-duty, 3-ring vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8 ½-by 11-inch paper.
 - 2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty and/or guaranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number, fax number, and e-mail of installer.
 - 3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES".
 - a. Project name and number
 - b. Architect's name
 - c. Contractor's name
- B. Contractor shall provide two (2) sets of binders for all Warranties/Guaranties and shall include:
 - 1. Contractor, subcontractor, and equipment supplier shall provide Warranties and Guaranties on their original company letterhead with original signature.

- 2. Contractor shall provide original Warranties and Guaranties. Photo copies, fax and e-mail copies are not acceptable.
- C. Contractor shall organize warranty and guaranty documents into an orderly sequence based on the table of contents of the Project Manual.

1.5 PREPARATION

- A. Contractor shall obtain warranties and guaranties, executed in duplicate by each applicable and/or responsible subcontractor(s), supplier(s), and manufacturer(s), within fifteen (15) days after Substantial Completion. Except for items put into use with District’s permission, Contractor shall leave date of beginning of time of warranty or guaranty blank until the date of completion is determined by District.
- B. Contractor shall verify that documents are in proper original form, contain full information, and are notarized, when required.
- C. Contractor shall co-sign and co-execute all Warranties and Guaranties.
- D. Contractor, subcontractor, and equipment supplier must provide warranties/guaranties on their original company letterhead with original authorized principal charge signature. (Fax copy and e-mail will not be acceptable.)
- E. Contractor shall provide additional copies of each warranty and/or guaranty to include in operation and maintenance manual. Photocopies are acceptable for this purpose.
- F. For items of work delayed beyond date of Substantial Completion, Contractor shall provide updated submittal within ten (10) days after acceptance, listing the date of acceptance by District as start of the warranty and/or guaranty period.
- G. Contractor must complete all warranty and guaranty submittals as required by the Contract Documents prior to District approval of Contractor’s final application for Payment.

1.6 WARRANTY AND GUARANTY MANAGEMENT

- A. Warranty and Guaranty Management Plan
 - 1. Develop a warranty and guaranty management plan which contains information relevant to Specification Section 01 78 36, Warranties. At least 30 days before the planned Substantial Completion date, conduct a pre-warranty conference and, submit the warranty and guaranty management plan for District approval. Include within the warranty and guaranty management plan all required actions and documents to assure that the District receives all warranties and guaranties to which it is entitled. The plan must be in narrative form and contain sufficient detail to render it suitable for use by future maintenance and repair personnel, whether tradesmen, or of engineering background, not necessarily familiar with this contract. The term "status" as indicated below must include due date and whether item has been submitted or was accomplished. Warranty and guaranty information made available during the construction phase must be submitted to the District for approval prior to each monthly pay estimate. Assemble approved information in a binder and submit to the District upon acceptance of the Work. The construction warranty and guaranty period will begin on the date of Substantial Completion and continue for the full product warranty and guaranty period. A joint 4 month and 9 month warranty and guaranty inspection will be conducted, measured from Substantial

Completion, by the Contractor, District, and the Campus Representative. Include within the warranty and guaranty management plan, but not limited to, the following:

- a. Roles and responsibilities of all personnel associated with the warranty and guaranty process, including points of contact and telephone numbers within the organizations of the Contractors, subcontractors, manufacturers or suppliers involved.
- b. Listing and status of delivery of all Certificates of Warranty and Guaranty for extended warranty and guaranty items, to include roofs, HVAC balancing, pumps, motors, transformers, and for all commissioned systems such as fire protection and alarm systems, sprinkler systems, lightning protection systems, etc.
- c. A list for each warranted equipment, item, feature of construction or system indicating:
 - i) Name of item.
 - ii) Model and serial numbers.
 - iii) Location where installed.
 - iv) Name and phone numbers of manufacturers or suppliers.
 - v) Names, addresses and telephone numbers of sources of spare parts.
 - vi) Warranties and Guaranties and terms of warranty and/or guaranty. Include one-year overall warranty of construction. Items which have extended warranties or guaranties must be indicated with separate warranty and guaranty expiration dates.
 - vii) Cross-reference to warranty and guaranty certificates as applicable.
 - viii) Starting point and duration of warranty and guaranty period.
 - ix) Summary of maintenance procedures required to continue the warranty and guaranty in force.
 - x) Cross-reference to specific pertinent Operation and Maintenance manuals.
 - xi) Organization, names and phone numbers of persons to call for warranty and guaranty service.
 - xii) Typical response time and repair time expected for various warranted equipment.
- d. The Contractor's plans for attendance at the 4th and 9th month post-construction warranty and guaranty inspections conducted by the District.
- e. Procedure and status of tagging of all equipment covered by extended warranties and guaranties.
- f. Copies of instructions to be posted near selected pieces of equipment where operation is critical for warranty and guaranty and/or safety reasons.

B. Pre-Warranty Conference

1. At least thirty calendar days prior to Contract Substantial Completion, and at a time designated by the District, meet with the District Representatives to develop a mutual understanding with respect to the requirements of this section. Communication procedures for Contractor notification of construction warranty and guaranty defects, priorities with respect to the type of defect, reasonable time required for Contractor response, and other details deemed necessary by the District for the execution of the

construction warranty and guaranty will be established/reviewed at this meeting. In connection with these requirements and at the time of the Contractor's quality control completion inspection, furnish the name, telephone number and address of a licensed and bonded company which is authorized to initiate and pursue construction warranty and guaranty work action on behalf of the Contractor. This point of contact will be located within the local service area of the warranted construction, be continuously available, and be responsive to District inquiry on warranty and guaranty work action and status.

2. This requirement does not relieve the Contractor of any of its responsibilities in connection with other portions of this provision.

C. Contractor's Response to Construction Warranty and Guaranty Service Requirements

1. Following oral or written notification by the District, respond to construction warranty and guaranty service requirements in accordance with the "Construction Warranty And Guaranty Service Priority List" and the three categories of priorities listed below. Submit a report on any warranty and guaranty item that has been repaired during the warranty and/or guaranty period. Include within the report the cause of the problem, date reported, corrective action taken, and when the repair was completed. If the Contractor does not perform the construction warranty and/or guaranty within the timeframes specified, the District will perform the work and back-charge Contractor.

- a. First Priority Code 1. Perform onsite inspection to evaluate situation, and determine course of action within 4 hours, initiate work within 6 hours and work continuously to completion or relief.
- b. Second Priority Code 2. Perform onsite inspection to evaluate situation, and determine course of action within 8 hours, initiate work within 24 hours and work continuously to completion or relief.
- c. Third Priority Code 3. All other work to be initiated within 3 work days and work continuously to completion or relief.
- d. The "Construction Warranty and Guaranty Service Priority List" is as follows:

Code 1-Air Conditioning Systems

- (1) Recreational support.
- (2) Air conditioning leak in part of building, if causing damage.
- (3) Air conditioning system not cooling properly.

Code 1-Doors

- (1) Overhead doors not operational, causing a security, fire, or safety problem.
- (2) Interior, exterior personnel doors or hardware, not functioning properly, causing a security, fire, or safety problem.

Code 3-Doors

- (1) Overhead doors not operational.
- (2) Interior/exterior personnel doors or hardware not functioning properly.

Code 1-Electrical

- (1) Power failure (entire area or any building operational after 1600 hours)
- (2) Security lights
- (3) Smoke detectors

Code 2-Electrical

- (1) Power failure (no power to a room or part of building).
- (2) Receptacle and lights (in a room or part of building).

Code 3-Electrical
Street lights.

Code 1-Gas
(1) Leaks and breaks.

Code 1-Heat
(1) Area power failure affecting heat.
(2) Heater in unit not working.

Code 2-Kitchen Equipment
(1) Dishwasher not operating properly.
(2) All other equipment hampering preparation of a meal.

Code 1-Plumbing
(1) Hot water heater failure.
(2) Leaking water supply pipes.

Code 2-Plumbing
(1) Flush valves not operating properly.
(2) Fixture drain, supply line to commode, or any water pipe leaking.
(3) Commode leaking at base.

Code 3 -Plumbing
Leaky faucets.

Code 3-Interior
(1) Floors damaged.
(2) Paint chipping or peeling.

(3) Casework.

Code 1-Roof Leaks

Temporary repairs will be made where major damage to property is occurring.

Code 2-Roof Leaks

Where major damage to property is not occurring, check for location of leak during rain and complete repairs on a Code 2 basis.

Code 2-Water (Exterior)

No water to facility.

Code 2-Water (Hot)

No hot water in portion of building listed.

Code 3-All other work not listed above.

D. Warranty and/or Guaranty Tags

1. At the time of installation, tag each warranted or guaranteed item with a durable, oil and water-resistant tag approved by the District. Attach each tag with a copper wire and spray with a silicone waterproof coating. The date of Substantial Completion and the Contractor Authorized signature must remain blank until the date the District makes a determination of Substantial Completion. Show the following information on the tag:

WARRANTY/GUARANTEE INFORMATION

- a. Type of product/material _____
- b. Model number _____
- c. Serial number _____
- d. Contract number _____
- e. Warranty/Guaranty period _____ (months) from _____ to _____
- f. Inspector's signature _____
- g. Construction Contractor _____
 Address _____
 Telephone number _____
- h. Warranty or Guaranty contact _____
 Address _____
 Telephone number _____
- i. Warranty or Guarantee response time priority code _____
- j. WARNING - PROJECT PERSONNEL TO PERFORM ONLY OPERATIONAL MAINTENANCE DURING THE WARRANTY PERIOD.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

Not Used.

END OF SECTION 01 78 36

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**SECTION 01 78 39
PROJECT RECORD DOCUMENTS**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. All Contract Documents shall be reviewed for applicable provisions related to the provisions in this document, and provisions in the General Conditions and other Division 1 Specification Sections shall apply to this Section without limitation.

1.2 RELATED REQUIREMENTS SPECIFIED IN OTHER SECTIONS

- A. Section 01 11 00 – “Summary of Work”
- B. Section 01 26 00 – “Contract Modification Procedures”
- C. Section 01 32 13 – “Scheduling of Work”
- D. Section 01 31 00 – “Project Management and Coordination”
- E. Section 01 33 00 – “Submittal Procedures”
- F. Section 01 78 36 – “Warranties”
- G. Section 01 77 00 – “Closeout Procedures”
- H. Section 01 78 23 – “Operation and Maintenance Data”
- I. Divisions 2 through 41 Sections for Project Record Documents requirements for the work in those Sections.

1.3 SUMMARY

- A. This section includes administrative and procedural requirements for Project Record Documents, including but not limited to the following:
 - 1. Record Drawings
 - 2. Record Specifications
 - 3. Record Product Data
 - 4. Record MEP & Structural coordination documents
- B. Project Record Documents requirements include, but are not limited to, the following:
 - 1. Marked-up copies of Drawings
 - 2. Marked-up copies of Shop Drawings
 - 3. Newly prepared Drawings
 - 4. Marked-up Product Data submittals
 - 5. Field records, such as photographs, for variable and concealed conditions
 - 6. Record information for Work that is only schematically shown
 - 7. Maintenance forms for equipment
- C. Other Project closeout requirements are included in Section 01 77 00, Closeout Procedures.
- D. Contractor shall maintain Documents and Samples as follows:
 - 1. Contractor shall provide and store all required Project Record Documents and Samples in the Contractor field office apart from Contract Documents used for Construction. These

materials shall be available at any time upon request by the District, Architect and Project Inspector.

2. Project Record Documents shall not to be used for construction purposes.
 3. Maintain Project Record Documents in good order, and in a clean, dry, legible condition.
- E. Contractor shall dedicate one complete full-size set of the Contract Drawings and one complete Project Manual for use in recording as-built conditions.
 - F. The Contractor shall update the Record Drawings and Annotated Specifications as often as necessary to keep them current, but no less often than weekly.
 - G. The Record Drawings and Annotated Specifications shall be kept at the Site and available for review and inspection by the District and the Architect.

1.4 PROJECT RECORD DRAWINGS

- A. Mark-up Procedure: During the construction period, maintain a complete, current set of Contract Drawings and Shop Drawings uploaded and updated within the BLUEBEAM program for Project Record Documents purposes. Label each document “AS-BUILT RECORD”. Keep all record documents current.
- B. On completion of the Work and prior to Application for Final Payment, the Contractor will provide one complete set of AS-BUILT RECORD Drawings in AutoCAD (drawing) file format and one complete set in Adobe PDF file format.
- C. A reference by number to a Change Order, CCD, RFI, RFQ, RFP, Field Order or other such document is not acceptable as sufficient record information on any record document. Do not conceal any Work until required record information has been recorded.
 1. Contractor shall mark AS-BUILT Record Drawings to indicate the actual installation where the installation varies appreciably from the installation shown originally. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later. Items required to be marked include, but are not limited to:
 - a. Dimensional changes to the Contract Drawings (horizontal and/or vertical)
 - b. Revisions or any modification to details shown on the Contract Drawings
 - c. Depths of various elements of foundations in relation to main floor level or survey datum.
 - d. Horizontal and vertical location of underground utilities and appurtenances referenced to permanent surface improvements.
 - e. Location of internal utilities and appurtenances concealed in construction referenced to visible and accessible features of structure.
 - f. Locations of underground work, points of connection with existing utilities, changes in direction, valves, manholes, catch basins, capped stub outs, invert elevations and similar items
 - g. Final, actual numbering of each electrical circuit
 - h. Revisions to routing of piping and conduits
 - i. Revisions to electrical circuitry, including legends at electrical panels
 - j. Actual equipment locations
 - k. Duct size and routing

- l. Changes made by Change Order, CCD, ASI, or any other directive
- m. Details not on original Contract Drawings
- 2. Contractor shall mark completely and accurately AS-BUILT Record Drawing prints of Contract Drawings or Shop Drawings, whichever is the most capable of showing actual physical conditions. Where Shop Drawings are marked, show cross-reference on Contract Drawings location.
- 3. Contractor shall mark AS-BUILT Record Drawing sets within BLUEBEAM with red markings; use other colors to distinguish between changes for different categories of the Work at the same location.
- 4. Contractor shall mark important additional information that was either shown schematically or omitted from original Drawings.
- 5. Contractor shall note Contractor Change Directive numbers; Bid Alternate numbers, if any, Change Order numbers, and similar identification.
- 6. Contractor shall be responsible for Mark-up: Where feasible, the individual or entity who obtained Project Record Drawing data, whether the individual or entity is the installer, Subcontractor or similar entity, is required to prepare the mark-up on AS-BUILT Record Drawings.
 - a. Accurately record information in an understandable and legible drawing technique.
 - b. Record data as soon as possible after it has been obtained. In the case of concealed installations, record and check the mark-up prior to concealment.
 - c. The District, Architect, and Project Inspector will review all record documents each month prior to approval of Contractor’s Application for Payment.
- D. Contractor shall prepare Record Drawings: Immediately prior to inspection for Certification of Substantial Completion of the Work, review completed marked-up AS-BUILT Record Drawings with District, Project Inspector and Architect to ensure accuracy of information. Once accuracy of information is confirmed, prepare and submit a full electronic set, professionally drafted in AutoCAD format, of as-built Contract Drawings and Shop Drawings.
 - 1. Incorporate changes and additional information previously marked on print sets. Delete, redraw, and/or add details and notations where applicable. Identify and date each Drawing; include the printed designation “AS-BUILT RECORD DRAWING” and the date prepared in a prominent location on each Drawing.
 - 2. Distribution: Whether or not changes and additional information were recorded, organize the original marked-up set of drawings that were maintained during the construction period within BLUEBEAM into manageable sets. The sets should be labeled with all appropriate identification, including titles, dates and other information on cover sheets and submitted to District.
- E. In addition to requirements of this Section, comply with supplemental requirements of other specification sections.
 - 1. Section 01 33 00, Submittal Procedures, requires the preparation of large scale, detailed layout drawings of the Work in Divisions 2 through 33. These layout drawings are not Shop Drawings as defined by Section 01 33 00, but together with Shop Drawings or layout drawings of all other affected Sections are used to check, coordinate and integrate the work of the various Sections.
 - 2. Contractor shall include required layout drawings as part of the Project Record Documents.

1.5 PROJECT RECORD SPECIFICATION

- A. Contractor shall, during the construction period, maintain one copy of the Project Specifications, including all addenda and all other modifications issued for Project Record Documents purposes.
- B. Contractor shall mark the Project Record specifications to indicate the actual installation where the installation varies substantially from that indicated in Specifications and/or modifications issued. Note related Project Record Drawing information, where applicable. Give particular attention to substitutions, selection of product options, Change Order and Construction Change Directive Work, and information on concealed installation that would be difficult to identify, measure, and record later.
 - 1. In each Specification Section where products, materials or units of equipment are specified or scheduled, mark the Record copy with the proprietary name and model number of the product furnished.
 - 2. Where a specification allows Contractor to elect one of several brands, makes, or types of material or equipment, the annotations shall show which of the allowable items the Contractor has furnished.
 - 3. Record the name of the manufacturer, catalog number, supplier and installer and other information necessary to provide an accurate record of selections made, and coordinate documentation with Project Record Data submittals and maintenance manuals.
 - 4. Note any related Project Record Product Data that was submitted in maintenance manuals instead of Product Data submittals.
 - 5. Upon completion of mark-up, submit Project Record Specifications to District for District's records.

1.6 ADDITIONAL REQUIREMENTS FOR FINAL PROJECT AS-BUILT RECORD DOCUMENTS

- A. Using a distinct Auto CAD layer, clearly indicate at each affected plan, detail, schedule, or other drawing as necessary, a full description of changes made during construction along with the actual location of specified items.
- B. "Cloud" all changes made using a distinct AutoCAD layer.
- C. Submit duplicate electronic files of all drawings in both Auto CAD and Adobe PDF Format.

1.7 PROJECT RECORD PRODUCT DATA

- A. Contractor shall, during the construction period, maintain one copy of each Project Record Product Data submittal for "Project Record Document" purposes.
 - 1. Mark Project Record Product Data to indicate the actual product installation where the installation varies substantially from that indicated in Project Record Product Data submitted. Include any significant changes in the product as delivered and/or installed including any departures from the manufacturer's instructions and/or recommendations for installation.
 - 2. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 - 3. Note related Change Orders and mark-up of Project Record Drawings, where applicable.
 - 4. Upon completion of mark-up, submit a complete set of Project Record Product Data to District for District's records.

5. Where Project Record Product Data is required as part of maintenance manuals, submit marked-up Project Record Product Data as an insert in the manual, instead of submittal as Project Record Product Data.
 6. Contractor is responsible for mark-up and submittal of Project Record Product Data for its own Work.
- B. Material, Equipment and Finish Data:
1. General: Provide one (1) preliminary review copy and two (2) final copies each of a "Materials, Equipment and Finishes Manual" listing all finish materials, equipment (not provided under Divisions 15 and 16), and finishes installed in the Work.
 2. Submit the preliminary manuals to the Architect a minimum of two (2) weeks prior to Substantial Completion. The preliminary copies must comply with all of the requirements, except the hardboard covers.
 3. Obtain approval of preliminary copies prior to producing final copies.
 4. Deliver final manuals to the Architect prior to final acceptance and final payment. Architect will deliver manuals to the District.
 5. Format of Manual: Provide bound manuals with printed covers and spines. Title "Materials, Equipment and Finishes Manual". Organize data sequentially by Specification Section number on type written 8-1/2 by 11-inch pages. Provide each copy with a typewritten index and tabbed dividers between each separate Section. Mark each tab to indicate contents.
 6. Contents of Manual: Manuals shall contain all information needed to identify, maintain, and replace/duplicate any finish materials, equipment, and finishes installed in the Work for this Project. Where materials and product information has been described and likewise indicated in the "Operation and Maintenance Manuals", cross referencing to where they can be found may be done in lieu of duplication of the information. The information provided shall include, but not be limited to, the following:
 - a. Manufacturer's names and model numbers or product name; supplier's and subcontractor's name, address and phone and fax numbers; and all other pertinent information that might be required for replacement ordering or duplication at a later date.
 - b. For custom-fabricated products that do not have model numbers or names, reference Project shop drawing submittal number and indicate "Fabricated per shop drawing submittal Number _____".
 - c. Proportions of mixes.
 - d. Color formula list for each paint color used.
 - e. For power operated equipment, include complete and legible wiring diagrams together with cuts of repair parts and part numbers listed and instructions relative to care, adjustment and operation of the equipment.
 - f. For moisture protection and weather exposed products, include complete manufacturer's data with instructions on inspection, maintenance and repair.
 - g. Where applicable, provide information on care and maintenance, including manufacturer's recommendations for types of cleaning agents to be used and methods of cleaning. Provide information regarding cleaning agents and methods that could prove detrimental to the product.

- C. Contractor shall arrange Project Record Product Data by Specification Section number, and provide names, addresses, fax numbers, emails addresses, and telephone number of Subcontractors and suppliers. Information to be provided includes:
1. Trade Names
 2. Model or type numbers
 3. Assembly diagrams
 4. Operating instructions
 5. Cleaning instructions
 6. Maintenance instructions
 7. Recommended spare parts
 8. Product data

1.8 MISCELLANEOUS PROJECT RECORD SUBMITTALS

- A. Refer to other Specification Sections for miscellaneous record keeping requirements and submittals. Immediately prior to Substantial Completion of the Work, complete all miscellaneous records and place in good order, properly identified, and readied for use and reference. Submit to the District for District's records, in Adobe PDF format. Categories of miscellaneous records include, but are not limited to, the following:
1. Field records on excavations and foundations
 2. Field records on underground construction and similar work
 3. Survey showing locations and elevations of underground lines
 4. Invert elevations of drainage piping
 5. Surveys establishing building lines and levels
 6. Authorized measurements utilizing unit prices or allowances
 7. Records of plant treatment
 8. Ambient and substrate condition tests
 9. Certifications received in lieu of labels on bulk products
 10. Batch mixing and bulk delivery records
 11. Testing and qualification of tradespersons
 12. Documented qualification of installation firms
 13. Load and performance testing
 14. Inspections and certifications by governing authorities
 15. Leakage and water-penetration tests
 16. Fire resistance and flame spread test results
 17. Final inspection and correction procedures
 18. Final As-Built Construction Schedule
 19. Project Record Drawing Mark-ups
 20. Other

1.9 INSTALLATION, OPERATION, AND MAINTENANCE MANUALS

- A. Submit Installation, Operation, and Maintenance Manuals in accordance with this Section, Section 01 33 00, Submittal Procedures and Section 01 78 23, Operation and Maintenance Data.

1.10 ELECTRONIC MEDIA FORMAT

- A. Electronic Media Formats: Electronic media formats shall be Adobe PDF and AutoCAD.
 - 1. Adobe PDF files shall have chapter markers and/or bookmarks inserted in place of the equivalent hard copy section tabs. Adobe PDF copy shall include all Project Record Drawings, updated Specification Manuals, tables, charts, drawings, codes and all other matters reflected in hard copies. Adobe PDF files shall be delivered on unique CD-ROMs containing Adobe PDF files of each completed project AS-BUILT Record Drawing and the complete Specifications Manual with all changes made during the Project.
 - 2. In addition to the Adobe PDF file copies, professionally drafted AutoCAD project AS-BUILT Record Drawing DWG files shall be delivered showing both design and as-built information. AutoCAD layouts shall be provided allowing for the reproduction of a complete set of plans as needed.

1.11 DISTRICT’S RECOURSE

- A. If Contractor is not able to provide Project Record Documents in specified formats, District has the right to complete the Work using other resources. Contractor agrees that any and all costs associated with District completion of this Work shall be deducted from the Contract Price by Change Order.

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION

3.1 RECORDING

- A. Post changes and modifications to the Contract Documents as they occur. Do not wait until the end of the Project. District may periodically review Project Record Documents to assure compliance with this requirement.

3.2 SUBMITTALS

- A. At completion of Project, deliver all Project Record Documents to District, per Section 01 33 00 (Submittal Procedures.)
- B. Accompany submittal with transmittal letter containing:
 - 1. Date
 - 2. Project title and number
 - 3. Contractor’s name and address
 - 4. Number and title of each Project Record Document
 - 5. Certification that each document as submitted is complete and accurate and signature of Contractor or Contractor’s authorized representative.

END OF SECTION 01 78 39

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SECTION 01 79 00

DEMONSTRATION AND TRAINING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. All Contract Documents shall be reviewed for applicable provisions related to the provisions in this document, and provisions in the General Conditions and other Division 1 Specification Sections shall apply to this Section without limitation.

1.2 RELATED REQUIREMENTS SPECIFIED IN OTHER SECTIONS

- A. Section 01 11 00 – “Summary of Work”
- B. Section 01 77 00 – “Closeout Procedure”
- C. Division 2 through 41 Sections for Demonstration and Training requirements for the work in those Sections

1.3 SUMMARY

- A. This Section includes administrative and procedural requirements for instructing District’s personnel, including the following:
 - 1. Demonstration of operation of systems, subsystems, and equipment
 - 2. Training in operation and maintenance of systems, subsystems, and equipment
 - 3. Demonstration and training videos

1.4 SUBMITTALS

- A. Instruction Program: Contractor shall submit 5 copies of the instructional program outline for all required demonstration and training to District for approval. Outlines shall include:
 - 1. Schedule of proposed meeting dates and times
 - 2. Description of topics to be covered and learning objectives
 - 3. Length of instruction time
 - 4. Instructor’s names and qualification information for each training module
- B. At completion of training, provide two complete training manuals for the District’s use.
 - 1. Training Manual shall comply with Section 01 78 39 (Project Record Documents.)
- C. Attendance Record: For each training module, provide list of participants and length of instruction time.
- D. Demonstration and Training (DVD) Videos: Submit 2 digital copies to District within 5 days of completion of each training module.
 - 1. Identification: On each CD/DVD copy Contractor shall, provide an applied label with the following information:
 - a. Project Name

- b. Project Number
- c. Contract Number
- d. Name of Contractor with address, and telephone number
- e. Date video was recorded
- f. Topic(s) covered

1.5 QUALITY ASSURANCE

- A. Instructor Qualifications: A factory-authorized service representative or District approved equivalent, complying with requirements in Section 01 45 00 (Quality Control) and experienced in operation and maintenance procedures and training for Project specific systems and equipment.
- B. Contractor shall coordinate instruction schedule and verify availability of educational materials, instructor’s personnel, audiovisual equipment, and facilities needed to avoid delays.
- C. For instruction that must occur outdoors, review weather forecast and provide alternatives if conditions are unfavorable.

1.6 COORDINATION

- A. Contractor shall coordinate instruction schedule with the District Project. Adjust schedule as required to ensure proper attendance and to minimize disrupting Campus operations.
- B. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content. Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data has been reviewed and approved by Architect.
- C. Provide written notice (15) working days in advance to District with a copy to the Architect prior to any scheduling instruction sessions. District shall furnish Contractor with names and positions of intended participants.
- D. Contractor shall provide and coordinate schedule of all required training with Project Phases. Coordinate with the District

PART 2 - PRODUCT

2.1 INSTRUCTION PROGRAM

- A. Program Structure: Contractor shall develop and provide instruction program that includes group training modules for each system and equipment not part of a system, as required by individual Specification Sections, and as follows:
 - 1. Motorized doors including, but not limited to, the following:
 - a. Overhead coiling doors
 - b. Overhead coiling grilles
 - c. Automatic entrance doors
 - 2. Equipment including, but not limited to, the following:
 - a. Projection screens

- b. Loading dock equipment
 - c. Waste compactors
 - d. All Food-service equipment and appliances, including coolers and refrigerators
 - e. Exhaust hoods and controls
3. Fire-protection systems including, but not limited to, the following:
 - a. Fire alarm
 - b. Fire pumps
 - c. Fire-extinguishing systems
 - d. Fire sprinkler system
 4. Intrusion detection systems
 5. Conveying systems including, but not limited to, the following:
 - a. Elevators
 - b. Wheelchair lifts
 6. Heat generation including, but not limited to, the following:
 - a. Boilers
 - b. Pumps
 - c. Steam distribution piping
 - d. Water distribution piping
 7. Refrigeration systems including, but not limited to, the following:
 - a. Chillers
 - b. Cooling towers
 - c. Condensers
 - d. Pumps
 - e. Distribution piping
 8. HVAC systems including, but not limited to, the following:
 - a. Air-handling equipment
 - b. Air distribution systems
 - c. Terminal equipment and devices
 - i) Chilled beams
 - ii) Radiant floor systems
 9. HVAC instrumentation and controls, including BAS.
 10. Electrical service and distribution including, but not limited to, the following:
 - a. Transformers
 - b. Switchboards
 - c. Panelboards
 - d. Uninterruptible power supplies
 - e. Motor controls

11. Lighting Fixture equipment and controls
 12. Communication systems including, but not limited to the following:
 - a. Intercommunication
 - b. Surveillance
 - c. Voice and data equipment
 - d. Other as required elsewhere in the Contract Documents
- B. Training Modules: Contractor shall develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participant is expected to master. For each module, include instruction for the following:
1. Review basis of system design
 2. Operational requirements and criteria, including:
 - a. System, subsystem, and equipment descriptions
 - b. Operating standards
 - c. Regulatory requirements
 - d. Operating characteristics
 - e. Limiting conditions
 - f. Performance curves
 3. Detailed review of documentation, including:
 - a. Emergency manuals and procedures
 - b. Operations manuals and procedures
 - c. Maintenance manuals and procedures
 - d. Identification systems
 - e. Warranties and Guarantees
 - f. Maintenance service agreements and similar continuing commitments
 - g. Normal shutdown instructions
 - h. Required sequences for electric or electronic systems
 - i. Special operating instructions and procedures
 - j. Troubleshooting and diagnostics
 - k. Test and inspection procedures

PART 3 - EXECUTION

3.1 PREPARATION

- A. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a combined training manual.
- B. Set up as required at instructional location.

3.2 DEMONSTRATION AND TRAINING VIDEOTAPES

- A. Record each demonstration and training session separately using digital video. Include classroom instructions, demonstrations, board diagrams, and other visual aids.
- B. Video Format: Provide high-quality color digital video.
- C. Fix camera before starting recording, unless otherwise necessary to show area of demonstration and training. Display continuous running time.
- D. Describe scenes on video using audio narration while video is recorded.

END OF SECTION 01 79 00

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**SECTION 01 81 15
CALGREEN ENVIRONMENTAL REQUIREMENTS**

PART 1 – GENERAL

1.1 SUMMARY

- A. Section includes: Comply with CALGreen environmental requirements related to energy efficiency, water efficiency and conservation, material conservation and resource efficiency, and environmental quality.
 - 1. Nonresidential Projects: Comply with specific CALGreen requirements for nonresidential projects.
- B. Related Requirements:

1.2 ENVIRONMENTAL REQUIREMENTS

- A. Mandatory Measures: Comply with CALGreen Mandatory Measures applicable to Project.
 - 1. Design team and construction team are each required to participate to maximum degree possible to achieve CALGreen environmental requirements.
 - 2. Contract Documents are not intended to limit alternative means of achieving environmental requirements.
 - a. Suggestions from Contractor, subcontractors, suppliers, and manufacturers for achieving environmental requirements are encouraged; team approach is also encouraged.
 - 3. Voluntary Tiers: Contractor is encouraged to achieve enhanced Voluntary Tier levels by incorporating additional measures as defined in CALGreen Appendixes.
 - a. Contractor is required to achieve Mandatory Measures and to achieve as much as possible without unacceptable cost impact or schedule impact on Project.
- B. Requirements: Contractor is required to review CALGreen requirements relative to Nonresidential Projects.
 - 1. Energy Efficiency: Comply with California Energy Commission requirements.
 - 2. Water Efficiency and Conservation: Comply with requirements for both indoor and outdoor water use.
- C. Material Conservation and Resource Efficiency:
 - 1. Nonresidential Projects: Provide weather-resistant exterior wall and foundation envelope including prevention of landscape irrigation spray on structures (if any), and prevent water intrusion at exterior entries.
 - 2. Construction Waste: Provide construction waste management plan as defined by CALGreen with at least 50% of construction waste diverted from landfill by recycling or salvage for reuse.
 - 3. Nonresidential Project Building Maintenance and Operation: Provide for commissioning requirements as required by CALGreen including but not limited to testing, documentation and training, testing and adjusting.
- D. Nonresidential Projects Environmental Quality:
 - 1. Mechanical Equipment Pollution Control: Cover duct and related air distribution component openings to prevent dust and debris accumulation.
 - 2. Finish Material Pollution Control: Comply with CALGreen requirements for volatile organic compound (VOC) emissions including but not necessarily limited to following (as applicable):
 - a. Adhesives, sealants and caulks.
 - b. Paints and coatings.
 - c. Carpet systems including carpet, carpet cushions, and adhesives.
 - d. Resilient flooring systems.
 - e. Composite wood products formaldehyde limitations

3. Filters: Comply with requirements for mechanically ventilated buildings to have air filtration media for outside and return air prior to occupancy.
 4. Environmental Tobacco Smoke (ETS) Control: Comply with CALGreen requirements for ETS.
 5. Interior Moisture Control: Comply with California Building Code requirements and CALGreen requirements for vapor retarder at concrete slab foundations and capillary break (aggregate base).
 6. Building Material Moisture Content: Do not use water damage building materials, remove and place wet and high moisture content insulation, and do not enclose wall or floor framing when moisture content exceeds 19%.
 7. Indoor Air Quality: Comply with CALGreen requirements for outside air delivery and carbon dioxide monitoring.
 8. Environmental Comfort: Comply with CALGreen requirements for whole acoustical control and interior sound control.
 9. Outdoor Air Quality: Comply with CALGreen requirements for reduction of greenhouse gases and ozone depletion.
- E. Planning and Design: Construction team shall coordinate with Design Team regarding Project Planning and Design methods related to CALGreen requirements related to Project design and shall comply with requirements related to construction.

1.3 QUALITY ASSURANCE

- A. Project Management and Coordination: Contractor to identify one person on Contractor's staff to be responsible for CALGreen issues compliance and coordination.
1. Experience: Environmental project manager to have experience relating to CALGreen building construction.
 2. Responsibilities: Carefully review Contract Documents for CALGreen issues, coordinate work of trades, subcontractors, and suppliers; instruct workers relating to environmental issues; and oversee Project Environmental Goals.
 3. Meetings: Discuss CALGreen Goals at the following meetings.
 - a. Pre-construction meetings
 - b. Pre-installation meetings
 - c. Regularly scheduled job-site meetings
 - d. CALGreen Issues Criteria: Comply with requirements listed in CALGreen and various Specification sections.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General Issues: Do not use materials with moisture stains or with signs of mold or mildew.
1. Moisture Stains: Materials that have evidence of moisture damage, including stains, are not acceptable, including both stored and installed materials; immediately remove from site.
 2. Mold and Mildew: Materials that have evidence of growth of molds or of mildew are not acceptable, including both stored and installed materials; immediately remove from site.

PART 3 - EXECUTION

3.1 PROTECTION

- A. Environmental Issues: Protect interior materials from water damage; where interior products not intended for wet applications are exposed to moisture, immediately remove from site.

1. Protect installed products using methods that do not support growth of molds and mildews. Immediately remove from site materials with mold and materials with mildew.

END OF SECTION

Attachments:

1. DSA Form GL-4 - Project Submittal Guideline (11 pages)

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SECTION 01 92 20

GUIDELINES FOR FACILITY OPERATIONS DURING A PROTEST

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. All Contract Documents shall be reviewed for applicable provisions related to the provisions in this document, and provisions in the General Conditions and other Division 1 Specification Sections shall apply to this Section without limitation.

1.2 RELATED REQUIREMENTS SPECIFIED IN OTHER SECTIONS

- A. Section 01 11 00 – “Summary of Work”

1.3 SUMMARY

- A. Project Security
 - 1. Project security is the responsibility of the Contractor. However, there may be occasions where campus events elicit a protest response from campus and community constituencies. If protests occur at the Site, the District will attempt to insure a safe work environment for construction activities. If the safety of the Site cannot be assured by the District (both for the construction personnel and for the equipment and materials), the Contractor will be directed to vacate the Site and asked not to return until the Site can be secured.

1.4 PROCEDURES DURING A PROTEST

- A. Known Protests (Most Common):
 - 1. In most cases, protests will be anticipated. Information is provided in advance to the College of the Redwoods Police Department (CRPD), or the assemblage can be seen from the Site.
 - 2. Under these conditions, CRPD will dispatch officers to the Site. CRPD will notify the District Representative who will contact the Project Inspector. Once on Site, the supervising CRPD officer will introduce himself to the Contractor's Superintendent, the Project Inspector and a review of the situation will be made.
 - 3. The supervising CRPD officer will determine if the Contractor should cease work in certain areas, relocate his work forces, or vacate the premises.
 - 4. The Project Inspector, and Contractor will document the action in their daily report(s), and consideration shall be given to the Contractor for an extension of contract time only. Any extension of Contract Time will be by an executed Change Order and shall be reviewed and approved by District.
- B. Unknown Event:
 - 1. In the event that protest activities occur without prior notification and consultation with CRPD, the Contractor is to cease all work activities that may directly or indirectly cause harm to a worker or protestor.
 - 2. The Contractor should leave the affected area, and if possible, remove tools, equipment and construction materials. The Contractor’s Superintendent will notify the Project Inspector of the event.

3. The Project Inspector will record this activity in their daily report and consideration may be given by District to the Contractor for an extension of Contract Time.
- C. If the Contractor is prevented from vacating the affected area by protestors, CRPD will attempt to provide safe egress for the Contractor.
- D. Under no circumstances is the Contractor to confront protestors, incite activity, or physically impede their intended activity.
- E. The Contractor shall be aware of the work area and cognizant of any unusual visitors to the Site.
- F. Jurisdiction is as follows:
 - On-Campus Events:
College of the Redwoods Police Department (CRPD)
Primary Phone: 707-476-4112
Emergency: 707-476-4111
 - Off-Campus Events:
Humboldt County Sheriff's Office (Non-Emergency)
Phone: 707-445-7251
 - Emergency:
911

END OF SECTION 01 92 20

DIVISION 02

EXISTING SITE CONDITIONS

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SECTION 02 81 00 - TRANSPORT AND DISPOSAL OF UNIVERSAL WASTE AND OTHER
HAZARDOUS MATERIALS

PART 1 - GENERAL

1.1 SUMMARY OF HAZARDOUS MATERIALS-RELATED WORK

- A. The work described by these specifications is applicable to the College of the Redwoods (CR) STADIUM UPGRADE Project (project). The structures and various building associated with the CR project shall herein be defined as the project site for the purpose of these specifications.
- B. This work involves disturbance of finishes and components at the CR project site that are known or assumed to contain hazardous materials, including asbestos, lead, PCBs and universal waste.
 - 1. The Contractor shall determine and implement applicable federal, state and local regulations, including California Department of Industrial Relations, Division of Occupational Safety and Health (Cal/OSHA) worker protection requirements, including Title 8 of the California Code of Regulations, Section 1532.1 (8 CCR 1532.1) and 8 CCR 1529, in a manner that protects Contractor personnel, site employees, the public and the environment from potential asbestos and/or lead contamination resultant from Contractor work in association with this project.
- C. Wastes are to be disposed of by the Contractor as hazardous wastes unless proven otherwise by waste characterization sampling.
 - 1. The work includes the proper containment, removal, transport, and disposal of the following potentially hazardous materials associated with Contractor work including, but not limited to, the following:
 - 2. All materials used for work area preparation
 - 3. All discarded personnel protective equipment
 - 4. All other potentially contaminated materials
 - 5. All hazardous materials and contaminated waste(s) and debris
- D. Contractor shall furnish all labor, materials, services, insurance and equipment which are specified, shown or reasonably implied for effective transport, and disposal of hazardous materials from the project site including the following work:
 - 1. See separate hazardous material abatement requirements, to be provided by the owner.
 - 2. Universal Waste
 - a. Waste streams(s) associated with material designated as Universal Waste (UW) is to be segregated, containerized, transported and disposed of by the Contractor as per applicable regulations and these specifications.
 - 3. All other debris generated by the work of the Contractor that has been classified as hazardous due to the characteristics of toxicity, as determined by required testing performed by the Contractor in accordance with Title 22 CCR Div. 4.5 and this specification.
- E. All work shall be supervised by experienced persons trained, knowledgeable and qualified in the techniques of hazardous material proper handling, disposal requirements and the subsequent cleaning of contaminated areas.
- F. The Contractor shall be responsible for all costs associated with transportation and disposal of all wastes generated as the result of this work.
- G. Unless otherwise noted, the Contractor shall provide all materials, equipment, and labor necessary to produce finished Work as shown on the Drawings and as specified herein.

1.2 RELATED DOCUMENTS

- A. See separate hazardous material abatement requirements, to be provided by the owner.

1.3 REFERENCES

- A. The following referenced documents form part of the specifications and the applicable requirements of those documents are incorporated by reference. Conflicts between these Specifications and the referenced documents should be brought to the attention of CR, in writing, for resolution before taking any related action. Where differences exist between codes and standards, the one affording the greatest protection shall apply.
1. Code of Federal Regulations (CFR)
 - a. 29 CFR 1926, Construction Standards
 - b. 29 CFR 1926 Subpart Z, Toxic and Hazardous Substances
 - c. 29 CFR 1926.1101, Asbestos (including all mandatory appendices)
 - d. 40 CFR Part 61, Subpart A and Subpart M, USEPA National Emission Standards for Hazardous Air Pollutants (NESHAP)
 - e. 40 CFR Part 82, Protection of Stratospheric Ozone: Supplemental Rule Regarding a Recycling Standard Under Section 608 of the Clean Air Act; Final Rule
 - f. 40 CFR Parts 261, 265, and 268, Hazardous Waste Management
 - g. 40 CFR Part 273, Standards for Universal Waste Management
 - h. 40 CFR Part 761.41, PCBs Manufacturing, Processing, Distribution in Commerce, and use Prohibitions
 - i. 40 CFR Part 763, Asbestos Emergency Hazard Emergency Response Act (AHERA)
 - j. 49 CFR Parts 172, 173, 178, 179, Hazardous Material Transportation
 - k. Guidance on the Management of Polychlorinated Biphenyls (PCBs), Environmental Guidance Manual, US Department of Energy Office of Environmental Guidance, RCRA/CERCLA Division (EH-231), DOE/EH-0350, June 1993
 2. California Code of Regulations (CCR)
 - a. 8 CCR Division 1, Chapter 4, Construction Safety Orders
 - b. 8 CCR Article 2.5, Registration of Asbestos Work, Sections 341.6–341.14
 - c. 8 CCR Section 1529, Asbestos
 - d. 8 CCR Section 5144 Respiratory Protection
 - e. 22 CCR Division 4.5, Environmental Health Standards for Management of Hazardous Waste, including:
 - f. 22 CCR Division 4.5, Chapter 10, Hazardous Waste Management System: General
 - g. 22 CCR Division 4.5, Chapter 11, Identification and Listing of Hazardous Waste
 - h. 22 CCR Division 4.5, Chapter 12, Standards Applicable to Generators of Hazardous Waste
 - i. 22 CCR Division 4.5, Chapter 16, Recyclable Materials (Recyclable Hazardous Waste)
 - j. 22 CCR Division 4.5, Chapter 18, Land Disposal Restrictions
 - k. 22 CCR Division 4.5, Chapter 23, Standards for Universal Waste Management
 - l. 22 CCR Division 4.5, Chapter 31, Waste Minimization
 - m. California Environmental Protection Agency (Cal/EPA), California Air Resource Board (CARB), Final Regulation Order, Section 93105, Asbestos Airborne Toxic Control Measures for Construction, Grading, Quarrying, and Surface Mining Operations

- n. California Health and Safety Code, Division 20, Chapter 6.5, Section 25143.2 (d)(7), (e), & (f) and Sections 25143.9 & 25143.10 – regarding recycling CFC or HCFC gasses.
- B. North Coast Unified Air Quality Management District (NCAQMD)
 - a. The Rules and Regulations of the NCAQMD
- C. Fire, Life & Safety Regulatory Authority
 - a. Applicable rules and regulations issued by the State Fire Marshall

1.4 DEFINITIONS

- A. Definitions specific to the work of this section:
 - 1. Action Level (AL) – Cal/OSHA employee exposure level for airborne concentrations of lead of 30 micrograms per cubic meter of air ($30 \mu\text{g}/\text{m}^3$) calculated as an eight-hour time-weighted average (TWA) per CCR Title 8, Section 1532.1 Lead (8 CCR 1532.1)(b).
 - 2. Air Monitoring – The process of measuring the air contaminant content of a specified volume of air in a stated period of time. The purpose of air monitoring is to determine compliance with regulatory occupational and specified environmental exposure limits for airborne contaminants.
 - 3. Asbestos Containing Material (ACM) – Any material containing more than one percent asbestos.
 - 4. Asbestos Containing Construction Material (ACCM) – Any manufactured construction material which contains more than one tenth of one percent asbestos by weight.
 - 5. Asbestos-related work – Any activity that disturbs ACCM and may release fibers into the air.
 - 6. Cal/OSHA – The State of California Department of Industrial Relations, Division of Occupational Safety and Health.
 - 7. CDPH – The State of California Department of Public Health.
 - 8. Certified Lead Supervisor – A certified lead supervisor is an individual who has received a certificate or an interim certificate from CDPH as a “certified lead supervisor.”
 - 9. Certified Lead Worker – A certified lead supervisor is an individual who has received a certificate or an interim certificate from CDPH as a “certified lead worker.”
 - 10. Competent Person – An onsite supervisor who has been formally trained in hazardous materials work and who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate such hazards. In addition, a competent person for asbestos work is one who is specially trained in accordance with the USEPA Model Accreditation Plan (40 CFR part 763) for supervisor, or its equivalent, and who is capable of selecting the appropriate control strategy for asbestos exposure and/or asbestos-related hazards.
 - 11. Containment – Protective physical barriers and associated means and methods used to contain airborne contaminant dust and debris within the work area and prevent contamination of surfaces and grounds below and adjacent to areas where a hazardous material is being disturbed.
 - 12. Coolant gasses – Refrigerant gasses that are known or suspected to contain regulated chlorofluorocarbon (CFC) or HCFC gasses whose release to atmosphere is prohibited and that require special equipment and EPA certified refrigerant reclaimer personnel to safely and properly remove the gas for recycling or destruction at a permitted facility so that the remaining equipment to be demolished or removed can be disposed of in accordance with applicable regulations.

13. Fluorescent Light Ballast (FLB) – A device that electrically controls fluorescent light fixtures. Most existing FLBs include a capacitor containing 0.1 kilograms or less of dielectric fluid that may contain PCBs. Ballasts manufactured prior to 1979 may contain PCB capacitors. More recently, electronic ballasts have come into use that do not have dielectric fluids or PCBs. Ballasts with PCB capacitors also contain asphalt potting compounds which are likely to contain PCBs.
14. Fluorescent Lamp or Tube – A low pressure electric discharge lamp which generates ultraviolet light radiation by the passage of an arc through mercury vapor; the inner surface of the lamp tube is coated with a phosphor which absorbs the ultraviolet light and converts some of it to visible light. Spent fluorescent tubes typically contain mercury in concentrations exceeding the total threshold limit concentration (TTLC) and/or the soluble threshold limit concentration (STLC) making them a presumptive hazardous waste in California.
15. Hazardous Materials – Substances with properties that can cause injury or illness to humans or adversely impact living organisms in the environment under certain conditions. Hazardous materials include both organic and inorganic chemicals and chemical compounds. Includes any substance on the list of hazardous substances prepared by the Director of the California Department of Industrial Relations, pursuant to Labor Code Section 6382 and also known as the Director's List. For this project, hazardous materials include but are not limited to asbestos, lead, chromium, hexavalent chromium, PCB, and mercury compounds.
16. Hazard Communication (HAZCOM) – Hazard communication training and product labeling is required by Cal/OSHA to be implemented by CR for each employee exposed to hazardous materials. HAZCOM shall be in accordance with the Hazard Communication Standard (8 CCR 5194). For this plan, HAZCOM training shall be understood to include the hazards associated with lead containing materials and surface coatings.
17. Hazardous Lead Waste – Lead-containing debris shall be classified as hazardous due to the characteristic of toxicity, as determined by testing in accordance with the California Code of Regulations, Title 22, Division 4.5. Any substance(s) listed in Chapter 11 Section 66261.24 at concentrations greater than the applicable listed Soluble Threshold Limit Concentration (STLC) or Total Threshold Limit Concentration (TTLC) is considered hazardous waste and may need to be further characterized by the Toxicity Characteristic Leaching Procedure (TCLP) in accordance with 40 CFR 261 and other tests prior to disposal as a hazardous waste.
18. Hazardous Waste – Waste material that is listed or meets the criteria for hazardous waste as set forth in California Code of Regulations (CCR), Title 22, and Article 9 (see below). At minimum, with regard to the work project, the following shall be considered to be hazardous wastes associated with lead containing paint with respect to this section:
 - a. Debris that has been classified as hazardous due to the characteristics of toxicity, as determined by testing in accordance with Title 22 CCR, Div. 4.5.
 - b. Any substance listed in Chapter 11, Section 66261.24 at concentrations equal to or greater than its listed Soluble Threshold Limit Concentration (STLC) of 5.0 parts per million (ppm) or Total Threshold Limit Concentration (TTLC) of 1000 ppm. If the STLC or TTLC values are exceeded, the lead related waste will need to be further characterized by the Toxicity Characteristics Leaching Procedure (TCLP) in accordance with 40 CFR 261.
 - c. Friable ACM, Regulated Asbestos Containing Material (RACM), or nonfriable ACM rendered friable during work
19. Heavy Metals – Toxic metals, including but not limited to lead, arsenic, cadmium, chromium including chromium (VI), mercury and others that have toxic properties to humans and the environment.
20. HEPA Filter – A High Efficiency Particulate Air (HEPA) filter capable of trapping and retaining 99.97 percent of particles greater than 0.3 microns in diameter.

21. HEPA Vacuum Equipment – High efficiency particulate air (HEPA) filtered vacuuming equipment with a filter system capable of collecting and retaining lead dust. Filters shall be certified to be of 99.97% efficiency for retaining particles of 0.3 microns diameter or larger.
22. Incinerator – An engineered device using controlled flame combustion to thermally degrade PCBs and PCB items. Examples of devices used for incineration include rotary kilns, liquid injection incinerators, cement kilns, and high temperature boilers.
23. Intact LCP/LBP Components – LCP/LBP components (including equipment) removed substantially intact with LBP firmly adhering to the surface.
24. Lead Based Paint (LBP) – Paint that contains greater than or equal to 0.5 percent lead by weight, or 5,000 ppm, when analyzed by atomic absorption spectroscopy (AAS) or inductively coupled plasma-atomic emissions spectroscopy (ICP-AES) or 1.0 milligrams of lead per square centimeter (mg/cm^2) as determined by x-ray fluorescence (XRF) testing or laboratory analysis, or as identified by plan. Untested paints or coatings must be presumed to contain LBP. The presence of LBP triggers specific CDPH rules for residential and public buildings. LBP triggers certain Cal/OSHA pre-job notification requirements, if quantity thresholds are exceeded.
25. Lead Containing Paint – Consumer Product Safety Commission (CPSC) definition of a paint or finish coating with a lead content of greater than 0.009 percent by weight (90 ppm). Note: Cal/OSHA regulation requires compliance with worker protection rules when impacting paint or material containing lead at any detectable level. Untested paints must be presumed to contain lead at Lead Based Paint (LBP) levels (see LBP definition, above).
26. Lead Containing Material – Any material, other than a paint or coating, with a lead content of 0.5 percent (5,000 ppm) or greater. Lead containing material may pose occupational and environmental hazards depending on lead content (level), operation or process, amount of disturbance, and other factors.
27. Lead Contaminated Dust – Lead-contaminated dust means dust that contains an amount of lead equal to, or in excess of:
 - a. Forty micrograms per square foot ($40 \mu\text{g}/\text{ft}^2$) for interior floor surfaces; or
 - b. Two hundred and fifty micrograms per square foot ($250 \mu\text{g}/\text{ft}^2$) for interior horizontal surfaces; or
 - c. Four hundred micrograms per square foot ($400 \mu\text{g}/\text{ft}^2$) for exterior floor and exterior horizontal surfaces.
28. Lead Contaminated Soil – Lead-contaminated soil means bare soil that contains an amount of lead equal to, or in excess of, four hundred parts per million (400 ppm) in children's play areas and one thousand parts per million (1000 ppm) in all other areas.
29. Lead Hazard – Lead hazard means deteriorated lead-based paint, lead contaminated dust, lead contaminated soil, disturbing lead-based paint or presumed lead-based paint without containment, or any other nuisance which may result in persistent and quantifiable lead exposure.
30. Lead Related Construction – Any construction, alteration, painting, Demolition, salvage, renovation, repair, or maintenance of any residential or public building, including preparation and clean-up, that, by using or disturbing lead containing material or soil, may result in significant exposure of adults or children to lead.
31. Lead Related Waste – Paint chips, vacuum dust, and debris, used cleaning articles, wastewater, plastic sheets and other disposable items used during lead/chromium containing paint impaction are considered lead contaminated waste or suspect hazardous waste pending further characterization.
32. Leak or Leaking – Any instance in which a PCB Article, PCB Container or PCB Equipment has any PCBs on any portion of its external surface.
33. Mercury – A metal, liquid at room temperature, silver in color. Mercury is toxic by inhalation and skin absorption. Mercury is a poison to the central nervous system and

- gastrointestinal system. Mercury is considered an inorganic persistent and bioaccumulative toxic substance subject to Cal/EPA hazardous waste regulations.
34. CR – College of the Redwoods (CR), owner and operator of the project site, and CR's authorized personnel and designated representatives.
 35. Designated representative – Person(s) designated or appointed by CR to represent them in matters concerning work project at the site.
 36. Non-Hazardous Waste – Waste that does not meet any regulatory definition of hazardous, including nonfriable asbestos material and/or material containing less than one percent asbestos.
 37. Parts Per Million (ppm) – A common unit used to denote the lead concentration of surface coatings. Note: ppm is equivalent to milligrams per kilogram (mg/kg).
 38. PCB Ballast – An FLB that is known or suspected to contain PCBs. All FLBs must be considered PCB ballasts unless they are:
 - a. Labeled or marked "No PCB" by the manufacturer.
 - b. Manufactured in 1979 or later as indicated and verified on a date stamp or code, located on the ballast.
 - c. Labeled as "Electronic Ballasts" by the manufacturer.
 - d. General Electric HDF Ballasts manufactured from 1977 to 1978 and which have a "W" added to their catalogue number on the label of the ballast.
 - e. PCB Equipment – Equipment such as transformers, switch gear, circuit breakers that contain oils or dielectric fluids likely to have been manufactured prior to July 2, 1979. If the date of the manufacture and the type of dielectric fluid are unknown, any person must assume the equipment to be a PCB Equipment.
 - f. PCB Contaminated Equipment – Equipment which contains fluid whose PCB concentration is equal to or greater than 50 parts per million and less than 500 parts per million.
 39. Polychlorinated Biphenyl (PCB) – PCB's are any chemical substances consisting of the biphenyl molecule chlorinated to varying degrees or any combination of such molecules. PCB's have had a wide variety of past uses, including: dielectric fluids in transformers, capacitors. PCB is also often a contaminant in hydraulic fluid systems. PCB's are clear to yellow oily substances which are toxic to the liver and reproductive system. PCB's are suspect human carcinogens.
 40. PCB-Contaminated Material – A non-liquid material containing PCBs at concentrations greater than or equal to 50 parts per million but less than 500 parts per million; a liquid material containing PCBs at concentrations greater than or equal to 50 parts per million but less than 500 parts per million or where insufficient liquid material is available for analysis, a non-porous surface having a surface concentration of greater than 10 micrograms per 100 square centimeters but less than 100 micrograms per 100 square centimeters, measured by a standard wipe test as defined in 40 CFR 761.123
 41. Permissible Exposure Limit (PEL) – This is the highest level of a regulated contaminant in air that an employee can be permitted to be exposed to in an eight hour work day without respiratory protection. When the PEL is exceeded, action must be taken to lower the exposure level and protect the worker per applicable regulations.
 42. Lead PEL – An exposure to airborne lead of 50 micrograms of lead per cubic meter of air ($50 \mu\text{g}/\text{m}^3$), averaged over an 8-hour workday referred to as a time weighted average (TWA).
 43. Asbestos PEL – An exposure to airborne asbestos fibers of 0.1 fibers per cubic centimeter of air, averaged over an 8-hour workday (0.1 f/cc TWA).
 44. Personal Protective Equipment (PPE) – Coveralls, respirators, gloves, eye and hearing protection, hardhats and/or other personal equipment worn by individuals for the purpose of shielding from exposure to potentially hazardous materials or site conditions.
 45. Presumed Lead-Based Paint – Presumed lead-based paint means paint or surface coating affixed to a component in or on a structure constructed prior to January 1, 1978. Presumed lead-based paint does not include paint or surface coating that has been

- tested and found to contain an amount of lead less than one milligram per square centimeter (1.0 mg/cm²) less than half of one percent (0.5%) by weight, or less than 5,000 ppm.
46. Qualified Person – The specially trained individual to be responsible for conducting air sampling, calibration of air sampling pumps, evaluating sampling results, and conducting respirator fit tests. This role is often assigned to the Competent Person.
 47. Recycling – Spent fluorescent tubes can be recycled, allowing for the recovery of mercury, glass, and aluminum end caps. There are a number of facilities within California Authorized by Cal/EPA for recycling of fluorescent tubes. Metals associated with PCB ballasts can be recycled, but the PCBs must be incinerated by TSD facility permitted by the EPA for PCB incineration.
 48. Regulated Area – An area established by the employer to demarcate areas where hazardous materials-related work is conducted, and any adjoining area where debris and waste from such work accumulates.
 49. Removal – Procedures specified as necessary to remove and clean-up hazardous materials, paint and debris with heavy metal contamination or components with heavy metal containing coatings from the designated areas and to dispose of these materials at an acceptable site in accordance with Federal, State and Local Regulations.
 50. Stabilization – Process of stabilizing existing loose or deteriorated paint by removing loose paint and preparing the surface for painting using lead trained workers and a suitable containment system to prevent lead hazard to personnel or the environment. Proper surface preparation with lead dust and contamination controls is required. Stabilization is normally complete with removal of loose paint on components and equipment to be demolished. However, the final step of stabilization for components to remain is the application of a suitable or specified primer coat and, depending on the project plans, finish coats when and as specified. Also referred to as lead paint stabilization, surface preparation, or LBP stabilization.
 51. State – The State of California.
 52. Trigger Task – Operation, process or task specifically identified by Cal/OSHA Lead Standard - 8 CCR 1532.1 as a potential lead exposure hazard requiring certain protective measures to be implemented prior to obtaining the results of an initial exposure assessment.
 53. Transportation Storage Disposal (TSD) Facility – An USEPA or State permitted facility for transportation, storage, and disposal of hazardous wastes.
 54. Universal Waste – Certain common designated hazardous wastes that are required to be handled and disposed of or recycled in accordance with special rules. Includes fluorescent light tubes, high intensity discharge (HID) lamps, sodium vapor lamps, mercury switches, mercury thermostats, nickel-cadmium (NiCad), Silver, Mercury and other batteries (often used in building alarms and emergency systems), and other items.
 55. USEPA – United States Environmental Protection Agency.
 56. Visually Clean – Free of visible dust, paint chips, dirt, debris, or films removable by vacuuming or wet cleaning methods specified. For outside soil or ground cover areas, visually clean shall mean free of construction or paint debris, chips or dust distinguishable from the initial soil or ground conditions.
 57. Washroom/Hygiene Facility – A facility established or designated outside the work area for personnel decontamination. Where an asbestos or lead PEL is exceeded, the washroom/hygiene facility shall contain a shower with hot and cold water and a water filtration system.
 58. Waste Coordinator – CR individual(s) identified to provide waste material handling, storage, transportation, disposal and general waste regulation compliance oversight and guidance.
 59. Wet Cleaning – The process of eliminating lead dust contamination from building surfaces and objects by using wet cloths, mops, or other cleaning tools which have been washed with specified detergent solutions and rinsed with clean water.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Provide six (6) mil thick polyethylene sheeting.
- B. Provide six (6) mil thick leak-tight polyethylene bags.
- C. Provide other impervious containers or drums as required by applicable regulations.
- D. Duct tape, two inches (2") or wider, capable of sealing joints of adjacent sheets of plastic sheets and for attachment of plastic sheets to finished or unfinished surfaces or dissimilar materials and capable of adhering under both dry and wet conditions.

PART 3 - PROJECT EXECUTION

3.1 REQUIRED LICENSURE/CERTIFICATES

A. Transportation of hazardous waste:

- a. Contractor shall itself be, or have a subcontractor who is, a registered hazardous waste transporter with the California Department of Toxic Substances Control (DTSC). The contractor shall submit to CR or CR's representative the names, terminal addresses and commercial hauler CA numbers for at least two potential hazardous waste haulers at least 10 days prior to the start of abatement activities. Notification fees shall be paid for by the contractor.

B. Transportation of non-hazardous waste:

- 1. Operator of a non-hazardous waste hauling company must comply with State and local licensing requirements applicable to the type of waste, type of vehicle utilized to haul waste, and the destination for disposal or recycling of the waste.

C. Subcontractors shall hold all licenses applicable to the specified trade work.

3.2 SUBMITTALS AND NOTICES

A. Contractor shall submit the following to CR prior to the start of work applicable to these specifications:

- 1. Name and training documentation for the Competent Person responsible for disposal compliance (hazardous waste, non-hazardous waste, and construction debris).
- 2. Plan for disposal of hazardous wastes, associated contaminated wastes, non-hazardous wastes, and construction debris generated by this work in accordance with all applicable federal, state and local regulations
- 3. Name and certification of laboratory to be used for waste characterization analysis.

B. The contractor shall submit to CR the name, addresses (both business and truck terminal), USEPA identification number, California hazardous waste hauler registration number (if applicable), and California 'CA' commercial transporter number of the firm that is intended to be utilized to transport for disposal the asbestos and other wastes. Submit to CR.

C. CR may utilize this information to obtain a Management Information System Terminal Evaluation Report (MISTER) from the California Highway Patrol. The waste hauler(s) must have no "Unsatisfactory" ratings in the report if the hauler is to be approved by CR.

3.3 WORKER PROTECTION PROCEDURES

- A. Each worker assigned to perform work under this section shall be trained on the hazards of mercury, PCBs and other chemicals encountered during work under this section. Workers shall be trained in the Contractor's protective measures and procedures to prevent and control worker exposure. Such training shall be completed and documented prior to assignment of each worker to tasks covered by this section.
- B. Workers shall wear the appropriate chemically resistant gloves during clean up of PCB ballasts, transformers with PCB oil, and PCB-Contaminated Materials. In addition, for removal and handling of leaking PCB ballasts or clean up of PCB-Contaminated Materials, full body disposable protective suits shall be worn.
- C. Workers shall not eat, drink, smoke, or chew gum or tobacco while engaged in PCB ballast removal, handling or clean-up. Prior to leaving the Work Area to take a break or at the end of a work shift, each worker will carefully wash their hands using warm soapy water.
- D. Prior to starting removal operations, lock-out/tag-out electrical power to all systems to be removed.

3.4 WARNING SIGNS

- A. Signs shall be posted at each approach to areas where hazardous material-related work and/or waste storage is conducted.
- B. Signs shall be posted at a distance sufficiently far enough away from a Work Area to permit a person to read the sign and take necessary protective measures to avoid exposure.
- C. Asbestos Warning Signage

- 1. Post warning signs meeting the specifications of 8 CCR 1529 at perimeter/entry points to work areas where airborne concentration of asbestos fibers may exceed ambient background levels.
- 2. Language for warning signs is typically presented in the following format:

DANGER
ASBESTOS
MAY CAUSE CANCER
CAUSES DAMAGE TO LUNGS
AUTHORIZED PERSONNEL ONLY

- D. Lead Warning Signage
 - 1. Post warning signs meeting the specifications of 8 CCR 1531 at perimeter/entry points to the work areas where airborne concentration of lead may exceed ambient background levels.
 - 2. Language for warning signs is typically presented in the following format:

WARNING
LEAD WORK AREA
POISON
NO SMOKING OR EATING

3.5 LIGHTING, TRANSFORMER, AND SWITCHGEAR SYSTEM REMOVAL

- A. Verify lock-out/tag-out of electrical power to all lighting, transformer, and switchgear systems to be removed has been completed.
- B. Remove fluorescent tubes and/or mercury HID lamps intact and place in protective storage containers to avoid breakage.
- C. Place removed lighting tubes and HID lamps in secure labeled storage pending shipment for disposal or recycling.

- D. Remove systems to be demolished and place on a work surface protected with at minimum one layer of six mil plastic sheeting for removal of PCB electrical components such as ballasts, circuit breakers, and similar items.
- E. Open the lighting fixtures to examine the ballast systems. If ballast is labeled "No PCB", is an electronic ballast, or has a date stamp indicating it was manufactured in 1979 or later, it may be considered a non-PCB ballast. Other ballasts, which do not meet one or more of the above-noted criteria, shall be treated as PCB ballasts in the absence of valid product information stating otherwise.
- F. PCB ballasts which show visible evidence of leakage shall require the use of appropriate oil-resistant gloves during handling.
 - 1. Leakage of a clear to yellowish oily substance requires use of appropriate gloves for handling. Additionally, disposable protective coveralls shall be worn, as needed, to prevent contamination of personal clothing.
 - 2. PCB ballasts with evidence of leakage shall be double wrapped and sealed in plastic sheeting or bags.
- G. Place disposable gloves and coveralls in a six mil plastic waste bag containing a PCB warning label. Seal and place in pre-labeled shipping container(s).
- H. Request the Observation Service to conduct an inspection daily to verify proper identification and segregation of lighting ballasts based on PCB content. Upon satisfactory completion of inspection, carefully place PCB ballasts in approved, labeled, storage/shipping containers or drums and place in secure storage pending disposal as a PCB waste.
- I. After inspection and upon approval of the Observation Service or CR representative, place non-PCB ballasts in a non-hazardous waste bin for recycling or disposal as required.
- J. Removed transformer and switch gear equipment shall be labeled "PCB Equipment" pending sampling and analysis of fluids, or assumption of PCB content in the absence of valid objective information and data indicating otherwise.
- K. Remove any known or suspect PCB oil exterior surface contamination from the equipment and containerize for shipping as PCB equipment. Dispose of all PCB equipment at properly permitted PCB disposal and incineration facilities.

3.6 PCB SURFACE CONTAMINATION, CLEAN-UP AND/OR DISPOSAL

- A. Surfaces which have become contaminated by asphalt potting compound(s) or PCB oil leakage from a leaky PCB ballast and/or PCB transformer shall be either disposed of as PCB contaminated items subject to the CR's approval or shall be cleaned and decontaminated by the Contractor to removal any PCB residue to the decontamination standards.
 - a. Clean-up and decontamination procedures:
 - b. Protect all proximate surfaces such as floors below contaminated surfaces with two layers of six mil plastic sheeting.
 - c. Put on protective coveralls, PCB resistant gloves, and an approved respirator with organic cartridges.
 - d. Cordon off the area with barrier tape and remove all sources of ignition within 50 feet of the cleaning area.
 - e. Secure building ventilation to the area and provide adequate ventilation through use of windows, other passive ventilation. Clean surface using clean rags dampened with an approved safety solvent such as Stoddard solvent. Use minimum amount of solvent necessary to dampen rags.
 - f. Wipe items on surfaces until no visible signs of contamination are present. At minimum, three separate wipe downs with fresh cleaning materials is required.
 - g. Place spent cleaning materials in sealed plastic bags labeled with the PCB caution label. Place sealed bags in approved shipping container(s) for disposal as a PCB hazardous waste (greater than 500 ppm).

- h. The adequacy of the clean-up shall be determined by visual inspection of the surfaces by the Observation Service and, at the CR's discretion, by clearance wipe sampling per 40 CFR Part 761, Subpart G.
- i. When wipe samples are employed, the clean-up shall be considered satisfactory if the surface wipe result(s) are below 10 micrograms of PCB per 100 square centimeters of surface area for surfaces

3.7 BALLAST DISPOSAL

- A. Non-PCB ballasts and/or non-PCB equipment may be disposed of or recycled as non-hazardous construction waste.
- B. PCB ballasts and/or Transformers with PCB oil or assumed PCB oil shall be sampled, stored, and disposed of as California Hazardous Waste according to one of the following two methods as directed by the CR or Observation Service
 - 1. Disposal in appropriate packaging along with a suitable non-biodegradable absorbent material and subsequent burial at an approved and properly permitted Class I Hazardous Waste Landfill (dependent upon laboratory results and method of disposal).
 - 2. Disposal by incineration of PCB containing materials at an EPA permitted incinerator site that meets 40 CFR 761 requirements with non-hazardous metals being salvaged and recycled.
- C. All shipping containers and drums containing PCB ballasts and/or Transformers with PCB oil or assumed PCB oil are to be labeled with the yellow PCB "Contains PCBs" caution labels along with the name and address of the generator, date removed, description of waste, waste manifest number, and DOT shipping designation:
- D. RQ, Polychlorinated Biphenyls, 9, UN 2315, PG2.
- E. A California hazardous waste manifest shall be prepared by the Contractor and used for each shipment of PCB ballasts, Equipment, Item or Articles with PCB oil or assumed PCB oil and PCB-Contaminated Materials.

3.8 LIGHTING TUBE, MERCURY LAMP, & OTHER UNIVERSAL WASTE DISPOSAL

- A. Spent fluorescent light tubes and mercury HID lamps shall be considered universal wastes, packaged in protective containers that prevent breakage, and labeled as such for temporary on-site storage, transportation and disposal. Fluorescent lighting tubes and HID lamps shall be recycled at a California permitted recycler.
- B. At minimum, a Bill of Lading shall be used to transport spent lighting tubes and HID lamps and other mercury containing items and batteries to an authorized recycler.
- C. The Contractor shall provide the CR's Observation Service with copies of each hazardous waste manifest or Bill of Lading for shipping of mercury containing lighting wastes for disposal or recycling.
- D. All other Universal Wastes, including sodium lamps and batteries, shall be packaged, labeled, shipped and disposed of as a hazardous universal waste according to regulation.

3.9 REMOVAL AND RECYCLING OF COOLANT GASSES

- A. All air conditioning units, refrigerators, and refrigerated water drinking fountains shall be assumed to contain regulated chlorofluorocarbon (CFC) and/or HCFC gasses subject to federal and state regulation pertaining to containment and recycling.
- B. Use only properly EPA certified Refrigerant Reclaimers to remove CFC or HCFC from equipment to be demolished and scrapped.
- C. Remove CFC and HCFC gasses by approved equipment and methods which prevent escape to the atmosphere and recycle removed gasses in accordance with applicable federal and state regulation.

- D. Removed refrigerant gasses must be recycled or destroyed per regulation.

3.10 DISPOSAL CONTAINERS FOR HAZARDOUS WASTE

- A. The Contractor shall provide for secure onsite temporary storage of hazardous material, hazardous waste, and related wastes.
 - 1. All waste shall be stored in secure, locked, labeled, sealed impervious containers and not placed on the unprotected ground. Filled waste containers shall be locked and secured against unauthorized entry while stored onsite.
 - 2. All containers shall be shielded adequately to prevent dispersion of the debris by wind or rain and shall be labeled as hazardous waste.
 - 3. Any evidence of improper storage shall be cause for immediate shutdown of the project until a corrective action is taken.
 - 4. Waste storage location, equipment, containers and methods are subject to prior approval by CR.
- B. Provide labels for all waste container as all waste shall be labeled as hazardous or presumed hazardous, unless proven otherwise by appropriate sampling and laboratory analysis.
- C. All hazardous waste shipping containers shall meet applicable United States Department of Transportation (DOT) requirements.

3.11 WASTE PACKAGING PROCEDURES

- A. Hazardous Waste
 - 1. The Contractor shall adhere to the requirements of 40 CFR 262 and 265 and Title 22, Division 4.5 for the onsite handling of hazardous waste, with special attention given to the time of storage, amount of material stored at any one time, use of proper containers, and personnel training.
 - 2. The contractor is fully responsible for identifying, collecting, bagging, containerizing and labeling hazardous wastes per applicable regulations.
 - 3. Waste shall be removed from the Work Areas and properly containerized no later than the end of each work shift.
 - a. Debris and waste components shall be containerized no later than the end of each work shift and un-containerized waste shall not be left within the Work Area overnight.
- B. Non-Hazardous Waste
 - 1. Asbestos
 - a. Asbestos waste that is nonfriable and that does not contain greater than one percent asbestos is regulated by DTSC as non-hazardous waste. Such waste must be containerized and labeled according to all applicable regulations, including 8 CCR 1529. Waste containing asbestos must be properly characterized and disposed of according to all applicable regulations, including DTSC and USEPA transport and disposal procedures.
 - 2. Lead
 - a. Lead waste that does not exceed the federal or state waste characterization criteria via TTLC, STLC and/or TCLP analysis is considered non-hazardous for disposal purposes. Such waste must be containerized and labeled according to all applicable regulations, including 8 CCR 1532.1. Waste containing lead must be

properly characterized and disposed of according to all applicable regulations, including DTSC and USEPA transport and disposal procedures.

3.12 WASTE LABELS

- A. Hazardous wastes shall be labeled according to federal, state and local regulations including but not limited to Title 22 CCR, Chapter 30 and 49 CFR Parts 172, 173, 178 and 179.
- B. Asbestos Waste Labels
 - 1. All material containing asbestos shall be labeled in accordance with Cal/OSHA labeling requirements and include the following language:

**DANGER
CONTAINS ASBESTOS FIBERS
MAY CAUSE CANCER
CAUSES DAMAGE TO LUNGS
DO NOT BREATHE DUST
AVOID CREATING DUST**

- 2. In addition to the above warning label, friable ACM (RACM) shall be labeled with a hazardous waste generator label in accordance with the California Hazardous Waste Control regulations, as follows:

Hazardous Waste College of the Redwoods
7351 Tompkins Hill Road
Eureka, CA 95501
707-476-4100

Asbestos Waste Solid,
Inhalation Hazard

Accumulation Start Date: (date that each bag is filled)

USEPA Identification (ID) Number (Contractor to request ID number from CR)

3.13 WASTE STORAGE, SEGREGATION AND CHARACTERIZATION

- A. It is the Contractor's sole responsibility to ensure the waste produced by the Contractor is properly characterized and disposed of.
- B. The Contractor shall be responsible for secure onsite temporary storage for known or suspect hazardous waste, associated dust/debris, and related wastes (i.e. used PPE, used poly sheeting, etc.)
- C. Each category of suspect hazardous waste shall be tested and characterized according to requirements of the selected permitted waste disposal site.
 - 1. If other hazardous constituents are known or suspected to be present, the testing shall also include those substances.
 - 2. All testing shall be performed by a laboratory that complies with and is certified under the Environmental Laboratory Accreditation Program (ELAP) established by CDPH.
 - 3. The cost of all waste characterization or waste profiling required by the approved landfill will be the responsibility of the Contractor.
- D. Asbestos Waste Characterization
 - 1. The contractor is fully responsible for identifying, collecting, bagging, containerizing and labeling all friable asbestos containing wastes, if produced during this project, per the hazardous waste control regulations.
 - 2. Containerize all asbestos-containing Demolition debris waste streams in lockable waste shipping containers lined with at least two layers of 6 mil poly sheeting, or equivalent.

Asbestos warning labels meeting Cal/OSHA requirements shall be affixed to the exterior of the shipping container and to the exterior of the inner liner.

3. Clean external surfaces of containers thoroughly in the designated wet cleaning area of the equipment decontamination unit/area. Wet wipe each container thoroughly, and move to holding area pending removal to uncontaminated areas.
4. When loading ACM waste for disposal, establish a regulated area, restrict general access, and post warning signs meeting the specifications of Cal/OSHA General Industry Safety Order Section 5208 and/or Cal/OSHA 8 CCR Section 1529 (k)(7) at perimeter/entry points to the loading area.
5. Hazardous materials/waste characterization for asbestos generally applies to RACM and may be applicable to nonfriable ACM, if such nonfriable materials are rendered friable and/or impacted with mechanical means.

E. Lead Waste Characterization

1. Suspect hazardous waste streams and waste categories listed below shall be considered lead hazardous waste until proven otherwise through testing. Suspect hazardous waste shall be segregated by CR project based on potential for exhibiting hazardous waste characteristics. Lead related wastes, at a minimum, are to be segregated into the below listed categories:
2. Category I: Paint removed by chemical stripping, mechanical removal or abrasive media, paint chips, vacuum bags, used cleaning materials. These materials are typically hazardous wastes and shall be assumed hazardous unless proven nonhazardous via approved laboratory analysis.
3. Category II: Plastic sheeting and tape, disposable clothing, and equipment. These materials shall be non-hazardous if properly cleaned and decontaminated. However, these items are to be considered hazardous wastes subject to testing.
4. Category III: Work dust and debris from lead painted finishes and structures undergoing work are to be considered hazardous waste subject to testing.

F. Waste streams shall be tested by the Contractor using the established regulatory lead testing protocol thresholds (see 02 83 00) for determination of hazardous waste characterization:

1. Composite representative samples shall be taken of each waste stream category generated and shall be composited into one sample for analysis. A sufficient number of samples shall be taken adequately characterize each category of waste generated. It will be the responsibility of the Contractor to ensure representative samples are taken from each category of segregated waste.
2. The waste shall be packaged, stored, handled, transported and disposed of for each category of waste generated based on the testing results and regulatory protocol.
3. Based on the above testing protocols, any representative waste stream having a soluble lead concentration greater than or equal to five ppm lead as determined by STLC or TCLP analyses or any waste greater than or equal to 1,000 ppm lead using the TTLC analysis shall be considered a lead hazardous waste. If the TTLC result for a waste stream is less than 50 ppm lead, then no further testing is required for the sampled waste stream unless the waste changes in character or composition.

G. Fluorescent Light Tube and Ballast Characterization

1. Fluorescent tubes and/or mercury HID lamps are classified as universal waste.
2. Remove light tubes and lamps without breaking them, and place in protective storage containers to avoid breakage.
3. Place removed lighting tubes and HID lamps in secure labeled storage pending shipment for disposal or recycling

4. Fluorescent light ballasts that are known or suspected to contain PCBs are described as PCB ballasts. Fluorescent light ballasts must be considered PCB ballasts unless they are:
 5. Labeled or marked "No PCB" or "PCB Free" by the manufacturer.
 6. Manufactured in 1979 or later as indicated and verified on a date stamp or code, located on the ballast.
 7. Labeled as "Electronic Ballasts" by the manufacturer.
 8. General Electric HDF Ballasts manufactured from 1977 to 1978 and which have a "W" added to their catalogue number on the label of the ballast.
 9. Contractor shall ensure that all light fixtures are visually inspected after electrical isolation and fixture removal to determine if they are PCB ballasts.
 10. Ballasts that cannot be identified as non-PCB should be considered PCB-containing and properly handled, collected, stored, transported and recycled or disposed of by an approved recycling or disposal facility in accordance with the requirements of 22 CCR, Section 67426.1.
 11. Ballasts determined not to contain PCBs can be considered non-hazardous and recycled or disposed of accordingly.

H. In the event that CR determines that the waste is not properly segregated, the mixed waste stream shall be considered hazardous. The Contractor shall be responsible for the costs associated with any additional testing required.

1. The Contractor shall bear full responsibility for additional costs associated with waste disposal and characterization if waste is not properly segregated as required herein.

3.14 WASTE DISPOSAL

- A. No waste characterized as hazardous waste or originating from a waste stream characterized as hazardous shall be stored onsite for more than 90 days prior to being properly transported for disposal.
- B. The contractor shall be responsible for compliance with all applicable DOT regulations governing the transportation of hazardous materials and hazardous wastes as applicable to the project.
- C. Wastes shall not be treated or processed in an attempt to mitigate the waste streams hazardous characteristics; as such treatment is prohibited by RCRA.
- D. All equipment, materials, and waste generated on this project must be removed offsite to their proper locations by the Contractor within seven calendar days from completion of all hazardous materials construction work.
- E. If the Contractor subcontracts for the transportation of waste, then it is the contractor's responsibility to ensure that the transporter/hauler is covered by the following minimum insurance coverage:
 1. Transporters shall maintain Transporter's Auto Liability with a combined and single limit (CSL) of not less than \$500,000 per occurrence for bodily injury and property damage liability. The policy must also have a MCS-90 Endorsement and Sudden and Accidental Pollution Insurance Endorsement. The Sudden and Accidental Pollution Insurance must have minimum limits of \$1,000,000 per occurrence. A higher limit on the MCS-90 endorsement required by law must be matched by the Sudden and Accidental Pollution Insurance. Contractor and transporters shall maintain Worker's Compensation Insurance.
- F. If the contractor will be transporting wastes to the disposal sites, then the Contractor must have insurance coverage per this section.
- G. The contractor shall coordinate with CR to arrange a date and time for disposal shipments that is mutually convenient. The Contractor shall prepare the Uniform Hazardous or Non-hazardous Waste Manifest, as applicable. The CR Project Manager, or CR designee, shall review the

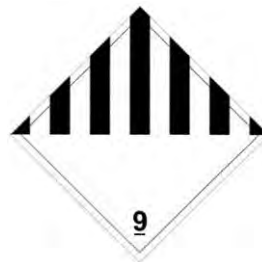
manifest and shall be the only individual authorized to sign the manifest on behalf of CR. No contractor employee shall sign a waste manifest on behalf of CR.

1. Upon waste or material pickup by the selected waste transporter, manifests shall be signed by CR and copies retained to verify that all steps of the handling and disposal process have been completed properly.
- H. Prior to transport of waste offsite, contact CR or CR designee and inform them of the intention to transport waste. All waste manifests, weight tickets and Bills of Lading shall be sent to:

College of the Redwoods Project Manager

- I. The Contractor shall submit to CR the Name, Class, and USEPA ID Number of the waste disposal site(s) to be used for each waste category that has been determined by testing to exceed the hazardous waste thresholds provided herein.
- J. Containers loaded for transportation must be free of exterior contamination and must be removed by uncontaminated workers who have entered the work location from uncontaminated areas.
- K. Asbestos Waste Disposal
 1. The contractor may only dispose of nonfriable asbestos-containing waste at landfills approved by California Environmental Protection Agency (CAL/EPA) for disposal of nonfriable asbestos, and as approved by CR.
 2. Containers holding friable asbestos waste must be labeled in accordance with the California Hazardous Waste Control regulations, as follows:
 3. Hazardous Waste

College of the Redwoods
7351 Tompkins Hill Road
Eureka, CA 95501
707-476-4100
Asbestos Waste Solid,
Inhalation Hazard
Accumulation Start Date: (date that each bag is filled)
USEPA Identification (ID) Number
 4. Hazardous asbestos waste must be transported in a manner that minimizes occupational exposure to airborne asbestos released during transit. Hazardous asbestos waste is a class 9 material with a reportable quantity (RQ) of one pound per package and must be transported under a Uniform Hazardous waste manifest using the following placard:



- L. Lead Waste Disposal
 1. Each suspect lead hazardous waste produced shall be placed in properly segregated, labeled and sealed impervious containers by the Contractor. Hazardous containers,

bags, and packaged waste shall be stored in a designated, secure, locked waste storage area and be labeled with the following information:

2. Waste Category: Lead UN2291, 6.1, PGIII
3. Waste Code: The USEPA waste code designation for lead is D008.
4. USEPA Identification Number: (CR to provide to Contractor)
5. Date Accumulated: (Insert Date)
6. College of the Redwoods
7. Eureka, California 95501
8. Origin of waste: (Insert Waste Stream Name, i.e. Paint Chips, Vacuum Bags)
9. The Contractor shall arrange to have the lead hazardous waste transported from the site in accordance with the requirements of 40 CFR 263 and 264, and disposed of properly in accordance with 40 CFR 268, 8 CCR Articles 40 and 41, 49 CFR Parts 172, 173, 178, and 179 and Title 22, Chapter 30, Articles 5, 6, 6.5 and 8.
10. Hazardous lead waste must be transported in a manner that minimizes occupational exposure to airborne lead released during transit. Hazardous lead waste is a class 6 material with a reportable quantity (RQ) of one pound for lead compounds and must be transported under a Uniform Hazardous waste manifest using the following placard:



- M. Fluorescent Light Tube and Ballast Disposal
- N. Fluorescent light tubes should be recycled or disposed of in accordance with the guidelines established by the DTSC Universal Waste Rule, as stated in 22 CCR Sections 66261.9 and 66273.1 thru 66273.90.
 - a. Spent fluorescent light tubes and mercury HID lamps shall be considered universal wastes, packaged in protective containers that prevent breakage, and labeled as such for temporary on-site storage, transportation and disposal. Fluorescent lighting tubes and HID lamps shall be recycled at a California permitted recycler.
 - b. At minimum, a Bill of Lading shall be used to transport spent lighting tubes and HID lamps and other mercury containing items and batteries to an authorized recycler.
 - c. The Contractor shall provide the CR with copies of each hazardous waste manifest or Bill of Lading for shipping of mercury containing lighting wastes for disposal or recycling.
 - d. All other Universal Wastes, including sodium lamps and batteries, shall be packaged, labeled, shipped and disposed of as a hazardous universal waste according to regulation.
- O. PCB ballasts shall be stored and disposed of as California Hazardous Waste according to one of the following two methods:
 1. Disposal in appropriate packaging along with a suitable non-biodegradable absorbent material and subsequent burial at an approved Class I Hazardous Waste Landfill.
 2. Disposal by incineration of PCB containing materials at an USEPA permitted incinerator site that meets the requirements of 40 CFR 761 with non-hazardous metals being salvaged and recycled.

P. Shipping containers and drums containing PCB ballasts or assumed PCB oil are to be labeled with the yellow PCB “Contains PCBs” caution labels along with the name and address of the generator, date removed, description of waste, waste manifest number, and DOT shipping designation:

1. Labels – all drums and shipping containers for PCB ballasts and other PCB hazardous wastes shall be labeled at minimum as follows:
 - a. Yellow PCB caution label with the following information:

**CAUTION
 CONTAINS PCBS
 (Polychlorinated Biphenyls)**

A toxic environmental contaminant requiring special handling and disposal in accordance with US Environmental Protection Agency Regulations 40 CFR 761 - For Disposal Information Contact the nearest USEPA Office

**In case of accident or spill, call toll free the
 U.S. Coast Guard National Response Center: 800-424-8802**

Also Contact: _____
Telephone
Number: _____

2. Shipping label shall contain the following information:
 - a. RQ, Polychlorinated Biphenyls, 9, UN 2315, PGII
 - b. Name and address of generator
 - c. Date removed
 - d. Contents: (e.g. PCB lighting ballasts)
 - e. Waste manifest number

3.15 ALTERNATIVE PROCEDURES

- A. If specified procedures cannot be utilized, a request shall be made in writing to CR providing details of the problem encountered and recommended alternatives.
- B. Alternative procedures shall provide equivalent or greater employee health and safety protection than procedures that are replaced.
- C. Any alternative procedure must be approved in writing by CR or authorized prior to the implementation of the procedure.

3.16 STOP WORK ORDERS

- A. If at any time CR or CR’s representative observes that the Contractor’s work or waste practices are violating these specifications, federal, state, or local regulations to the extent of potential endangerment of building users, workers, the public and/or the environment, the Contractor will be verbally notified by CR (followed up in writing) or CR designee that operations shall cease until corrective action is taken.
 1. A stop work order issued by CR or designee shall become effective immediately.
 2. The Contractor shall take corrective action before proceeding with work.

3. Loss or damage due to stop work order(s) shall be the Contractor's responsibility.

B. Contractor work shall not recommence work after a stop work notice is given until written notice to proceed has been provided to the Contractor by CR.

3.17 PROJECT CLOSEOUT

A. Prior to approval of final payment request, the Contractor must provide the following information:

1. Copies of all waste manifests, profile sheets and weight tickets for all wastes.

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DIVISION 03

CONCRETE

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SECTION 03 30 00 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

- A. Unless otherwise noted, the Contractor shall provide all materials, equipment, and labor necessary to produce finished Work as shown on the Drawings and as specified herein.
- B. Section Includes:
 - 1. Formwork.
 - 2. Reinforcement.
 - 3. Accessories.
 - 4. Cast-in place concrete.
 - 5. Finishing and curing.

1.2 REFERENCES

- A. American Concrete Institute:
 - 1. ACI 301 - Specifications for Structural Concrete.
 - 2. ACI 305 - Hot Weather Concreting.
 - 3. ACI 306.1 - Standard Specification for Cold Weather Concreting.
 - 4. ACI 318 – Building Code Requirements for Structural Concrete.
- B. ASTM International:
 - 1. ASTM C31/C31M - Standard Practice for Making and Curing Concrete Test Specimens in the Field.
 - 2. ASTM C33 - Standard Specification for Concrete Aggregates.
 - 3. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
 - 4. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete.
 - 5. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic Cement Concrete.
 - 6. ASTM C150 - Standard Specification for Portland Cement.
 - 7. ASTM C172 - Standard Practice for Sampling Freshly Mixed Concrete.
 - 8. ASTM C173/C173M - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.
 - 9. ASTM C260 - Standard Specification for Air-Entraining Admixtures for Concrete.
 - 10. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete.
 - 11. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete.
 - 12. ASTM C1017/C1017M - Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete.
 - 13. ASTM C1064/C1064M - Standard Test Method for Temperature of Freshly Mixed Hydraulic-Cement Concrete.
 - 14. ASTM C1107/C1107M - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink).
 - 15. ASTM E1643 - Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill under Concrete Slabs.

1.3 SUBMITTALS

- A. Product Data: Submit data on joint devices, attachment accessories and admixtures.
- B. Design Data:

1. Submit concrete mix design for each concrete strength. Submit separate mix designs when admixtures are required for the following:
 - a. Hot and cold weather concrete work.
 - b. Air entrained concrete work.
 2. Identify mix ingredients and proportions, including admixtures.
- C. Manufacturer's Installation Instructions: Submit installation procedures and interface required with adjacent Work.
- 1.4 CLOSEOUT SUBMITTALS
- A. Project Record Documents: Accurately record actual locations of embedded utilities and components concealed from view in finished construction.
- 1.5 QUALITY ASSURANCE
- A. Perform Work in accordance with ACI 301.
 - B. Conform to ACI 305 when concreting during hot weather.
 - C. Conform to ACI 306.1 when concreting during cold weather.
 - D. Acquire cement and aggregate from one source for Work.
 - E. Perform Work in accordance with Caltrans Standard Plans Standards.
 - F. Maintain one copy of each document on site.
- 1.6 COORDINATION
- A. Coordinate placement of joint devices with erection of concrete formwork and placement of form accessories.

PART 2 - PRODUCTS

- 2.1 FORM MATERIALS AND ACCESSORIES
- A. Form Materials: At discretion of Contractor. New materials to be used.
 - B. Form Release Agent: Colorless mineral oil not capable of staining concrete or impairing natural bonding characteristics of coating intended for use on concrete.
- 2.2 REINFORCEMENT MATERIALS
- A. Reinforcing Steel: ASTM A615/A615M, 60 ksi yield grade, deformed billet bars, uncoated finish. Welded reinforcing steel shall be ASTM A706, 60 ksi yield grade.
 - B. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for support of reinforcing; plastic tipped or non-corroding for supports in slabs forming finished ceilings or where supports are exposed to weather.
 - C. Fabricate concrete reinforcement in accordance with ACI 318.
- 2.3 CONCRETE MATERIALS
- A. Cement: ASTM C150, Portland Cement Type II – Moderate.
 - B. Normal Weight Aggregates: ASTM C33.
 1. Coarse Aggregate Maximum Size: 1 inch in accordance with ACI 318.

- C. Water: ACI 318; potable, clean and without deleterious amounts of chloride ions.

2.4 ADMIXTURES

- A. Air Entrainment: ASTM C260, containing no chlorides or other corrosion causing chemicals.
- B. Chemical: ASTM C494/C494M Type A – Water Reducing, Type D – Water Reducing and Retarding, containing no chlorides or other corrosion causing chemicals.
- C. Fly Ash: ASTM C618 Class F.
- D. Plasticizing: ASTM C1017/C1017M Type I, plasticizing and Type II, plasticizing and retarding.

2.5 ACCESSORIES

- A. Epoxy Bonding Compound: ASTM C881. Provide Type I for bonding hardened concrete to hardened concrete; Type II for bonding freshly mixed concrete to hardened concrete; and Type III as a binder in epoxy mortar or concrete, or for use in bonding skid-resistant materials to hardened concrete. Provide Grade 1 or 2 for horizontal surfaces and Grade 3 for vertical surfaces. Provide Class A if placement temperature is below 40 degrees F; Class B if placement temperature is between 40 and 60 degrees F; or Class C if placement temperature is above 60 degrees F.
- B. Vapor Retarder: ASTM E1745 10 mil thick; type recommended for below grade application. Furnish joint tape recommended by manufacturer.
- C. Non-Shrink Grout: ASTM C1107/C1107M; Grade A; premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents; capable of developing minimum compressive strength of 3,000 psi in 72 hours and 7,000 psi in 28 days.
- D. Aluminum Metal Isolation: Two coats of a high build polyimide epoxy paint, such as Tnemec 66, or equal (8 mils). Total thickness of system DFT = 8.0 mils.

2.6 JOINT DEVICES AND FILLER MATERIALS

- A. Joint Filler: ASTM D1751; Asphalt impregnated fiberboard or felt, 1/4 inch thick; tongue and groove profile.
- B. Joint Sealant: ASTM C920 unless otherwise noted; suitable for materials to which applied.
 - 1. Horizontal Joints: Grade P, use T.
 - 2. Vertical Joints: Grade NS.

2.7 CONCRETE MIX

- A. Mix and deliver concrete in accordance with ASTM C94, Option C.
- B. Select proportions for concrete in accordance with ACI 301.

Provide concrete to the following criteria:

For all concrete shown on civil drawings:

Material and Property	Measurement
Compressive Strength (28 day)	4,000 psi
Cement Type	ASTM C150
Water-Cement Ratio (maximum)	0.45 by weight (mass)
Aggregate Size (maximum)	1.0 inch
Air Content	3 percent plus or minus 1.5 percent
Fly Ash Content	Maximum 25 percent, minimum 15 percent of total weight of cementitious materials

Slump	One (1) inch minimum, five (5) inches maximum, as measured at point of placement.
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For all miscellaneous concrete not shown on civil drawings:

Material and Property	Measurement
Compressive Strength (28 day)	3,000 psi
Cement Type	ASTM C150
Water-Cement Ratio (maximum)	0.59 by weight (mass)
Aggregate Size (maximum)	1.0 inch
Air Content	3 percent plus or minus 1.5 percent
Fly Ash Content	Maximum 25 percent, minimum 15 percent of total weight of cementitious materials
Slump	One (1) inch minimum, four (5) inches maximum, as measured at point of placement.

C. Admixtures: Include admixture types and quantities approved through the submittal process.

1. Use accelerating admixtures in cold weather only when approved by the Engineer. Use of admixtures will not relax cold weather placement requirements.
2. Do not use calcium chloride nor admixtures containing calcium chloride.
3. Use set retarding admixtures during hot weather only when approved by the Engineer.
4. Add air entrainment admixture to concrete mix for work exposed to exterior.

D. Evaporation Retardant:

1. Provide to retard rapid evaporation of water from fresh exposed concrete.
2. Fluorescent color tint which shall disappear completely upon drying is optional.
3. Manufacturers:
 - a. Master Builders Co., Cleveland, OH, Confilm or Confilm LL-898.
 - b. Evelid Chemical Co., Cleveland, OH, Eucobar.
 - c. Or approved equal.

PART 3 - EXECUTION

3.1 FORMWORK ERECTION

- A. Erect formwork, shoring, and bracing to achieve design requirements. Use new materials for all formwork.
- B. Camber slabs and framing to achieve ACI 301 tolerances.
- C. Provide bracing to ensure stability of formwork.
- D. Form external corners of equipment pads with 3/4 inch chamfer.
- E. Apply form release agent to formwork prior to placing form accessories and reinforcement.
- F. Do not apply form release agent where concrete surfaces will receive special finishes or applied coverings affected by agent.
- G. Clean forms as erection proceeds, to remove foreign matter.

3.2 INSERTS, EMBEDDED COMPONENTS, AND OPENINGS

- A. Provide formed openings where required for work to be embedded in and passing through concrete members.
- B. Coordinate work of other sections in forming and setting openings, slots, recesses, chases, sleeves, bolts, anchors, and other inserts.
- C. Install concrete accessories straight, level, and plumb.

3.3 REINFORCEMENT PLACEMENT

- A. Place reinforcement, supported and secured against displacement.
- B. Ensure reinforcing is clean, free of loose scale, dirt, or other foreign coatings.
- C. Weld reinforcement in accordance with AWS D1.4.
 - 1. Do not weld crossing reinforcement bars for assembly except as permitted by Architect/Engineer.
- D. Space reinforcement bars with minimum clear spacing in accordance with ACI 318.
- E. Maintain concrete cover around reinforcement in accordance with ACI 318.

3.4 EXAMINATION

- A. Verify requirements for concrete cover over reinforcement.
- B. Verify anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, positioned securely, and will not interfere with placing concrete.

3.5 PREPARATION

- A. Prepare previously placed concrete by cleaning with steel brush and applying bonding agent. Remove laitance, coatings, and unsound materials.
- B. In locations where new concrete is doweled to existing work, drill holes in existing concrete, insert steel dowels and pack solid with non-shrink grout.
- C. Remove debris and ice from formwork, reinforcement, and concrete substrates.
- D. Remove water from areas receiving concrete before concrete is placed.

3.6 PLACING CONCRETE

- A. Place concrete in accordance with ACI 301.
- B. Notify testing laboratory minimum 24 hours prior to commencement of operations.
- C. Ensure reinforcement, inserts, embedded parts, formed expansion and contraction joints, and anchor bolts are not disturbed during concrete placement.
- D. Install vapor retarder under interior slabs on grade in accordance with ASTM E1643. Lap joints minimum 6 inches and seal watertight in accordance with manufacturer's recommendations.
- E. Repair vapor retarder damaged during placement of concrete reinforcing. Repair with vapor retarder material; lap over damaged areas minimum 6 inches and seal watertight in accordance with manufacturer's recommendations.
- F. Separate slabs on grade from vertical surfaces with 1/4 inch thick joint filler.
- G. Deposit concrete at final position. Prevent segregation of mix.
- H. Place concrete in continuous operation for each panel or section determined by predetermined joints.
- I. Do not interrupt successive placement: do not permit cold joints to occur.
- J. Consolidate concrete.
- K. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.
- L. Saw cut joints within 12 hours after placing. Saw cut joints as soon as concrete surface is firm enough not to be torn or damaged by blade and before random shrinkage cracks can form. Use 3/16 inch thick blade, cut into 1/4 depth of slab thickness.

- M. Screed slabs on grade level, maintaining surface flatness of maximum 1/4 inch in 10 ft.

3.7 CONCRETE FINISHING

- A. Finish concrete floor surfaces in accordance with ACI 301 and ACI 302.1.
- B. Steel trowel surfaces which are indicated to be exposed.
- C. In areas with floor drains, maintain floor elevation at walls; pitch surfaces uniformly to drains as indicated on drawings.

3.8 CURING AND PROTECTION

- A. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.
- B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.
- C. Cure slab surfaces in accordance with ACI 301.

3.9 FIELD QUALITY CONTROL

- A. Field inspection and testing will be performed by Owner's testing laboratory in accordance with ACI 301 and under provisions of General Conditions.
- B. Provide free access to Work and cooperate with appointed firm.
- C. Submit proposed mix design of each class of concrete to inspection and testing firm for review prior to commencement of Work.
- D. Concrete Inspections:
 - 1. Continuous Placement Inspection: Inspect for proper installation procedures.
 - 2. Periodic Curing Inspection: Inspect for specified curing temperature and procedures.
- E. Strength Test Samples:
 - 1. Sampling Procedures: ASTM C172.
 - 2. Cylinder Molding and Curing Procedures: ASTM C31/C31M, cylinder specimens, field cured.
 - 3. Sample concrete and make one set of three cylinders for every 50 cu yds or less of each class of concrete placed each day and for every 2,000 sf of surface area for slabs and walls.
 - 4. When volume of concrete for any class of concrete would provide less than 5 sets of cylinders, take samples from five randomly selected batches, or from every batch when less than 5 batches are used.
 - 5. Make one additional cylinder during cold weather concreting, and field cure.
- F. Field Testing:
 - 1. Slump Test Method: ASTM C143/C143M.
 - 2. Air Content Test Method: ASTM C173/C173M.
 - 3. Temperature Test Method: ASTM C1064/C1064M.
 - 4. Measure slump and temperature for each compressive strength concrete sample.
 - 5. Measure air content in air entrained concrete for each compressive strength concrete sample.
- G. Cylinder Compressive Strength Testing:
 - 1. Test Method: ASTM C39/C39M.
 - 2. Test Acceptance: In accordance with ACI 318.
 - 3. Test one cylinder at 7 days.

4. Test two cylinders at 28 days.
5. Retain one for testing when requested by Engineer.
6. Dispose remaining cylinders when testing is not required.

H. Maintain records of concrete placement. Record date, location, quantity, air temperature and test samples taken.

3.10 PATCHING

- A. Allow Engineer to inspect concrete surfaces immediately upon removal of forms.
- B. Excessive honeycomb or embedded debris in concrete is not acceptable. Notify Architect/Engineer upon discovery.
- C. Patch imperfections in accordance with ACI 301.

3.11 DEFECTIVE CONCRETE

- A. Defective Concrete: Concrete not conforming to required lines, details, dimensions, tolerances or specified requirements.
- B. Repair or replacement of defective concrete will be determined by Engineer.
- C. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Engineer for each individual area.

END OF SECTION

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SECTION 03 30 53 - MISCELLANEOUS CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SCOPE OF WORK

- A. Furnish all labor, material and equipment for the concrete work indicated below and shown on the drawings. Work includes but is not limited to:
 - 1. Assist Engineer in acquiring test cylinders for compression testing.
 - 2. Construct concrete curbing and slot drain concrete base as shown in the plans.
 - 3. Construct concrete paving for long jump and triple jump runway as shown in the plans.
 - 4. Construct concrete paving for the perimeter walkways as shown in the plans.
 - 5. Install concrete footings for fencing, netting, goal anchors and plates, etc.

1.2 STANDARD SPECIFICATIONS

- A. Standard Specifications for Road, Bridge and Municipal Construction, American Public Works Association (APWA)
- B. American Concrete Institute (ACI)
- C. American Society of Testing and Materials (ASTM)
- D. The Green Book Standard Specifications for Municipal Public Works Construction, California State Chapter (latest edition).

1.3 RELATED WORK IN OTHER SECTIONS

- A. Section 11 68 24 Equipment & Furnishings
- B. Section 31 22 16 Field Subgrade Establishment
- C. Section 32 18 23.10 Rubberized Track Surfacing

PART 2 - PRODUCTS

2.1 CONCRETE

- A. Refer to APWA Section 5-05, "Cement Concrete Pavement."
- B. Expansion Joints: Provide expansion joints at 10' o.c. maximum, equally spaced unless otherwise shown in the drawings.
- C. Joint Filler: Use non-staining, non-extruding, compressible and resilient, closed cell joint filler of neoprene foam conforming to ASTM D1752, Type RE-42. Joint fillers with contain or have been treated with oil, grease or bituminous materials are prohibited. Test joint fillers for compatibility with proposed sealant.
 - 1. Acceptable joint filler: Neoprene Sponge Rubber joint Filler by the Burke Company, or other accepted by Project Representative.
 - 2. Joint Sealant: ASTM C920, Grade NS, Class 25, Type M; multi-component, chemical curing, non-staining, non-bleeding, capable of continuous water immersion, non-sagging type; color to be selected.
- D. Preformed Expansion Joint Strips: Vinylex Corporation "VP 1391", or approved 1/2 inch-wide vinyl joint strip with removable cap.
- E. Control Joints: Provide control joints midway between expansion joints unless otherwise called for in the plans.
- F. Reinforcing:
 - 1. Recycled Content of Steel Products: Provide products with an average recycled content of steel products so post-consumer recycled content plus one-half of pre-consumer recycled content is not less than 25 percent.

2. Reinforcing Bars: ASTM A615/A 615M, Grade 60, deformed.
 3. Low-Alloy-Steel Reinforcing Bars: ASTM A 706/A 70-6M, deformed.
- G. Cast-in-place Concrete components
1. Aggregate: Clean, hard, durable particles of natural sand conforming to ASTM C33 for fine aggregate. Clean, uniformly hard, durable particles of gravel or crushed stone conforming to ASTM C33 for coarse aggregate.
 2. Cement: Conform to requirements of ASTM C150. Use Type I or, at Contractor's option, Type III. Any change in type or admix use shall be at approved locations.
 3. Ready-mixed Concrete: Conform to requirements of ASTM C94 Alternative #3.
 4. Maximum Size of Coarse Aggregate: Conform to requirements of ACI 301, Paragraph 3.6.
 5. Minimum Cement Content: Six sacks per cubic yard.
 6. Admixtures: Conform to requirements of ACI 301 and ASTM C260 for air entrainment. Use of accelerators or water-reducing retarders is prohibited.
 7. Maximum Water Content: Six gallons of water per sack of cement. Free of injurious amounts of oil, acids, alkali, salts, vegetable matter, and fit to drink.
 8. Minimum Concrete Compressive Strengths: A minimum compressive strength of 3,000 PSI shall be achieved in 28 days using Type I cement and in seven days using Type III cement, unless otherwise shown on drawings.
 9. Slump in Inches: Unless otherwise shown on drawings, conform to ASTM C143 procedures for concrete to be vibrated: Maximum = 4", Minimum = 1".
 10. Control Joints: Not less than 3/8" thick x 3/8" minimum depth with tooled edges.
 11. All concrete mix used shall be from the same source, with the same mix design, utilized throughout the project.

2.2 FORMWORK

- A. Forms: Wood, plywood, metal, other verified material to provide continuous, straight, structurally sound formwork and to produce specified concrete finish. Wood to be defect-free or properly corrected to provide straight lines and smooth, even surfaces.
- B. Form-coating compound: Commercial formulation form-coating compound that will not bond with, stain, nor adversely affect concrete surfaces requiring bond or adhesion, nor impede the wetting of surfaces to be cured with water or curing compounds, nor interfere with subsequent applications of finish such as paints or stains.
- C. Miscellaneous: Verified-type material and hardware for forming chamfers, recesses, openings, control joints, etc.
- D. Design of Formwork
 1. Design of formwork is Contractor's responsibility. Conform to shape, lines, and dimensions shown on the drawings. Design for adequate strength to sustain all construction loads without deformation or deflection.
 2. Make joints tight to prevent leakage of mortar. Properly brace and tie together to maintain position and shape. Truss for support if adequate foundation for shores cannot be provided. Fabricate accurately to minimize development of irregularities at panel joints. Construct to accommodate control, expansion, or other type joints shown on the drawings or as specified.
 3. Coordinate with all other trades to accommodate their work.

PART 3 - EXECUTION

3.1 SUBGRADE ESTABLISHMENT

- A. Establish subgrade at elevations required to achieve the slopes and finish grade elevations designated on the drawings. The Contractor shall schedule the Engineer for a subgrade inspection prior to installation of the concrete.

- B. The subgrade shall be compacted to a minimum of 95% maximum dry density. The subgrade shall be moistened to minimize absorption of water from fresh concrete.

3.2 FORMWORK INSTALLATION

- A. Thoroughly clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt or other debris just before concrete is placed. Prepare form surfaces by coating the contact surfaces of forms with a form-coating compound before reinforcement is placed.
- B. The form-coating compounds shall be thinned only with thinning agent of type, and in amount and under conditions of the form-coating compound manufacturer's directions. Do not allow excess form-coating material to accumulate in the forms or to come into contact with concrete surfaces against which fresh concrete will be placed. Apply in compliance with manufacturer's instructions.
- C. Coat steel forms with a non-staining, rust-preventative form oil or otherwise protect against rusting. Rust-stained steel formwork is not acceptable.
- D. Place and secure forms to correct location, dimension and profile. Assemble formwork to permit easy stripping and dismantling without damaging concrete.
- E. Place joint fillers vertical in position, in straight lines. Secure to formwork during concrete placement.

3.3 CONCRETE MIXING AND PLACING

- A. Conform to the requirements of ACI 301, Chapters 7 and 8, and ACI 304. Clean and free of all foreign matter, and all mixing and transporting equipment and subgrade and forms to receive concrete. Clean reinforcement of deleterious coatings.
- B. Notice of intention to place concrete shall be given to the Engineer at least 24 hours before an intended pour.
- C. Conform to ACI 305 "Recommended Practice for Hot Weather Concreting". Take steps to reduce concrete temperature and water evaporation by proper attention to ingredients, production methods, handling, placing, protection and curing.
- D. Conveying: Conform to ACI 301, Paragraph 8.2. Convey concrete from mixer to place of final deposit by methods preventing separation or loss of materials. Use pump, crane bucket, wheelbarrow, or buggies to deliver concrete to placing location. Chuting permitted only by methods to ensure a practically continuous flow of concrete at delivery end to prevent material separation.
- E. For walkways, curbing and slabs provide light broom finish and provide chamfer edges as shown in the details. Surface shall be stable, firm, and slip resistant and shall comply with CBC Sections 11B-302 and 11B-403.
- F. Curing Materials
 1. Absorptive Cover: Burlap cloth made from jute or kenaf weighing approximately 9 oz. per square yard, complying with AASHO M182, Class 3.
 2. Moisture-retaining Cover: Either waterproof paper, Polyethylene film, or Polyethylene-coated burlap, complying with ASTM C171.
 3. Membrane-forming Curing Compound: ASTM C309, Type I, unless other type acceptable to the Engineer.
- G. Joint Sealant: Following cure and cleaning of concrete surfaces, remove zip cap at expansion joints and install joint sealant per manufacturers instructions. All sealant at joints shall be oversanded at installation. Remove excess sand as needed.

3.4 FORMWORK REMOVAL

- A. All formwork shall be removed after proper curing of concrete. Protect surfaces of concrete during removal operations.
- B. Formwork not supporting weight of concrete may be removed after cumulatively curing at not less than 50 degrees F for 24 hours after placing concrete, provided concrete is sufficiently

hard to not be damaged by form removal operations and provided curing and protection operations are maintained.

3.5 REUSE OF FORMWORK

- A. Clean and repair surfaces of forms to be reused in work. Split, frayed, delaminated or otherwise damaged form-facing materials will not be acceptable for reuse. Apply new form-coating material as necessary, as specified for new formwork.

3.6 REPAIR OF SURFACE DEFECTS

- A. General: Conform to ACI 301, Chapters 9 and 13. After removal of forms, repair or patch concrete not formed as shown, out of alignment or level beyond required tolerances or that shows surface defects, to condition as verified by Engineer. Immediately after form removal, patch all tie holes and repairable defective areas.
- B. Honeycombed areas shall be removed to sound concrete but not less than 1" minimum depth. Dampen area and to 6" width around same; let evaporate only to loss of sheen. Provide a bond of neat cement and water slurry well brushed into area to be patched. Provide patching mixture of 1:2 (cement:sand) or verified proprietary patching mixture or color to match adjacent surfaces; use water quantity only as required for mixing and placing. Leave patched surface slightly high; after one hour, float to level with adjacent surface. Keep patched areas damp for seven days.

3.7 PROTECTION

- A. Protect freshly-placed concrete from premature drying and excessive cold or hot temperature, and maintain without drying at a relatively constant temperature for a period of time necessary for hydration of cement and proper hardening. Provide protection from vandalism.
- B. Protect all concrete during curing period from all damaging mechanical disturbances, more especially load stresses, heavy shock and excessive vibration. Protect finish surfaces from all damage.

3.8 TOLERANCES

- A. The surface elevation of the concrete curbing, perimeter walkway, and slotted drain, in the finished condition, shall not deviate more than 1/8" from specified elevations. Trueness measurement to be taken from 10' long straight edge placed in all directions.
- B. The grade tolerance of the field event paving shall be +1/8" and -0". The surface shall not deviate from the true surface in excess of 1/8" on a 10' straight edge in all directions.

3.9 CLEANUP

- A. At project completion, leave all work clean, defect-free, with uniform finish and color.

END OF SECTION 03 30 53
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SECTION 03 48 00 - PRECAST CONCRETE UTILITY BOXES

PART 1 - GENERAL

1.1 SUMMARY

- A. Unless otherwise noted, the Contractor shall provide all materials, equipment, and labor necessary to produce finished Work as shown on the Drawings and as specified herein.
- B. Section Includes:
 - 1. Precast concrete valve boxes.
 - 2. Precast concrete meter box.
 - 3. Precast check valve box

1.2 RELATED SECTIONS

Related work specified in other sections:

- A. Section 31 23 17 Trenching

1.3 REFERENCED CODES AND SPECIFICATIONS

The following standards apply:

- A. American Society for Testing and Materials:
 - 1. ASTM A48 - Standard Specification for Gray Iron Castings.
 - 2. ASTM A185 - Standard Specification for Steel Welded Wire Fabric, Plain, for Concrete Reinforcement.
 - 3. ASTM A536 - Standard Specification for Ductile Iron Castings.
 - 4. ASTM A615/A615M - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
 - 5. ASTM C33 - Standard Specification for Concrete Aggregates.
 - 6. ASTM C150 - Standard Specification for Portland Cement.
 - 7. ASTM C260 - Standard Specification for Air-Entraining Admixtures for Concrete.
 - 8. ASTM C857 - Minimum Structural Design Loading for Underground Precast Concrete Utility Structures.
 - 9. ASTM C858 - Underground Precast Concrete Utility Structures.
 - 10. ASTM C890 - Standard Practice for Minimum Structural Design Loading for Monolithic or Sectional Precast Concrete Water and Wastewater Structures.
 - 11. ASTM C913 - Standard Specification for Precast Concrete Water and Wastewater Structures.
 - 12. ASTM C990 - Standard Specification for Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joints Sealants.

1.4 DESIGN CRITERIA

- A. Watertight precast reinforced air-entrained concrete structures designed to ASTM C890 live loading and installation conditions, and manufactured to conform to ASTM C913.
- B. Minimum 28-day Compressive Strength: 5,000 psi.
- C. Honeycombed or retempered concrete is not permitted.

1.5 SUBMITTALS

Submit the following:

- A. Shop Drawing: Provide dimensional drawings and details for each precast concrete utility box. Indicate plan, location and inverts of connecting piping.
- B. Product Data: Submit data on valve vaults and meter boxes
- C. Manufacturer's Certificates: Submit Statement of Compliance, supporting data, from materials suppliers attesting that precast concrete valve vaults and meter boxes provided meet or exceed ASTM Standards and specification requirements.
- D. Manufacturer's Installation Instructions: Submit special procedures for precast concrete valve vaults and meter boxes installation.

1.6 QUALITY ASSURANCE

- A. Perform Work in accordance with applicable encroachment permits.
- B. Maintain **one copy** of **each** document on site.

1.7 DELIVERY, STORAGE AND HANDLING

- A. Delivery, Storage and Handling:
 - 1. Transport and handle precast concrete units with equipment designed to protect units from damage.
 - 2. Do not place concrete units in position to cause overstress, warp or twist.

1.8 ENVIRONMENTAL REQUIREMENTS

- A. Conduct operations not to interfere with, interrupt, damage, destroy, or endanger integrity of surface or subsurface structures or utilities, and landscape in immediate or adjacent areas.

1.9 COORDINATION

- A. Coordinate work with the Owner.

PART 2 - PRODUCTS

2.1 PRECAST CONCRETE VALVE BOXES AND OWNER METER BOXES

- A. Manufacturers:
 - 1. Oldcastle Precast
 - a. Valve Boxes: Model G05T with ADS plastic extension
 - b. Water Meter Box: Model as indicated on the Contract Drawings.
 - 2. Vaughn Concrete Products, Inc.
- B. Materials:
 - 1. Portland Cement: ASTM C150, Type II.
 - 2. Coarse Aggregates: ASTM C33; Graded 1 inch to No. 4 Sieve.
 - 3. Sand: ASTM C33; 2.35 fineness modulus.
 - 4. Water: Potable; clean and free of injurious amounts of acids, alkalis, salts, organic materials, and substances incompatible with concrete or steel.
 - 5. Air-Entraining Admixtures: ASTM C260.
 - 6. Reinforcing Steel:

- a. Deformed Bars: ASTM A615/A615M, Grade 40.
 - b. Welded Wire Fabric: ASTM A185.
7. Joint Sealant:
- a. ASTM C990.
- C. Mixes: Design concrete mix to produce required concrete strength, air-entrainment, watertight properties, and loading requirements.
- D. Frames and Covers:
- 1. Manufacturer: Oldcastle Precast
 - a. Model: As indicated on the Contract Drawings
 - 2. Ductile Iron Castings: ASTM A536.
 - 3. Covers suitable for light traffic loads.
 - 4. Contact surfaces machined and matched.
 - 5. Cast cover inscription with pipeline service.
- 2.2 PRECAST RESIDENTIAL WATER METER BOXES
- A. Refer to Section 33 12 33.
- 2.3 BEDDING MATERIALS
- A. Where indicated in the drawings, bedding material below precast concrete boxes, shall conform to the Caltrans Standard Specification Section 68-1.025, "Permeable Material". Use Class 2 Permeable Material
 - B. Bedding material below precast concrete box frames shall conform to the Caltrans Standard Specification Section 26-1.02A, "Class 2 Aggregate Base". Use $\frac{3}{4}$ " Class 2 aggregate base below precast concrete box frames as shown on the Contract Drawings.
- 2.4 FABRICATION AND MANUFACTURER
- A. Fabricate precast reinforced concrete boxes in accordance with ASTM C913, to dimensions indicated on Drawings, and to specified design criteria.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify piping connection, size, location, and invert are as indicated on Drawings.

3.2 FABRICATION

- A. Fabrication of precast concrete structures shall be in accordance with an approved shop drawing submittal.

3.3 PREPARATION

- A. Excavate to the required depth and install a 6 inch layer of Class 2 aggregate base below structure as shown on the Contract Drawings.

- B. Level the resting surface and verify top of aggregate base elevation so that top of box and pipe and/or conduit elevations will be as indicated on the Contract Drawings.

3.4 INSTALLATION

- A. Install all precast concrete products in accordance with manufacturer's instructions and as shown on the Contract Drawings.
- B. Excavate for precast vaults in accordance with Section 31 23 17 in location and to depth shown. Provide clearance around sidewalls of structure for construction operations.
- C. When groundwater is encountered. Prevent accumulation of water in excavations. Place manholes (and structures) in dry trench.
- D. Assemble multi section vaults by lowering each section into excavation. Lower, set level, and firmly position base section before placing additional sections.
- E. Lift precast components at lifting points designated by manufacturer.
- F. Remove foreign materials from joint surfaces and verify sealing materials are placed properly. Maintain alignment between sections by using guide services affixed to lower section.
- G. Verify vaults installed satisfy required alignment and grade.
- H. Remove knockouts or cut structure to receive piping without creating openings larger than required to receive pipe. Fill annular space with mortar.
- I. Set precast concrete sections plumb and aligned with the underlying sections with no more than quarter ($\frac{1}{4}$) inch maximum overlap.
- J. Exposed holes in the concrete sections required for handling or other purposes shall be filled with non-shrinking grout or by grout in combination with concrete plugs.

3.5 FIELD QUALITY CONTROL

- A. Request inspection by Engineer prior to placing aggregate cover over piping.
- B. Compaction Testing: See Specification 31 23 17 – Trenching.
- C. Frequency of Tests: three compaction tests per valve or meter box installation.

END OF SECTION

SECTION 03 60 00 - GROUT

PART 1 - GENERAL

1.1 SUMMARY OF SECTION

- A. The principal items specified herein are:
 - 1. Non-Shrink Grout: Non-Shrink grout is to be used unless another type is specifically referenced or as shown on the Drawings.
 - 2. Epoxy Grout
 - 3. Cement Grout

- B. The Contractor shall provide all materials, equipment, and labor necessary to furnish and place grout and shall form, mix, place, cure, repair, finish, and do all other work as necessary to produce finished grout as shown on the Drawings and as specified herein.

1.2. RELATED SECTIONS

Related work specified in other sections:

- A. Section 03 48 00 Precast Concrete Utility Boxes

- B. Section 32 13 13 Concrete Paving

1.3. REFERENCED CODES AND SPECIFICATIONS

The following standards apply:

- A. Specifications, codes, and standards shall be as specified in Section 32 13 13, Concrete Paving and as referred to herein.

- B. Commercial Standards:
 - 1. ASTM C 109 Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-In. or 50-mm Cube Specimens).
 - 2. ASTM C 531 Test Method for Linear Shrinkage and Coefficient of Thermal Expansion of Chemical-Resistant Mortars, Grouts, and Monolithic Surfacing.
 - 3. ASTM C 579 Test Methods for Compressive Strength of Chemical-Resistant Mortars, Grouts, and Monolithic Surfacing.
 - 4. ASTM C 827 Test Method for Change in Height of Early Ages of Cylindrical Specimens from Cementitious Mixtures.
 - 5. ASTM D 696 Test Method for Coefficient of Linear Thermal Expansion of Plastics.
 - 6. CRD-C 621 Corps of Engineers Specification for Non-shrink Grout.

1.4. SUBMITTALS

Submit the following:

- A. Certificates of Compliance: Certificates of Compliance shall be provided for all products and materials proposed to be used under this Section.

PART 2 - PRODUCTS

1.5. PREPACKAGED GROUTS

A. Non-Shrink Grout:

1. Non-shrink grout shall be a prepackaged, inorganic, non-gas-liberating, non-metallic, cement-based grout requiring only the addition of water. Manufacturer's instructions shall be printed on each bag or other container in which the materials are packaged. The specific formulation for each class of non-shrink grout specified herein shall be that recommended by the manufacturer for the particular application.
2. Non-shrink grouts shall have a minimum 28 day compressive strength of 7000 psi; shall have no shrinkage (zero percent) and a maximum 4.0 percent expansion in the plastic state when tested in accordance with ASTM C 827; and shall have no shrinkage (zero percent) and a maximum of 0.2-percent expansion in the hardened state when tested in accordance with CRD C 621.
3. Application: Non-shrink grout shall be used for the repair of all holes and defects in concrete members, grouting under all equipment base plates, and at all locations where non-shrink grout is specified.

B. Epoxy Grout:

1. Epoxy grout shall be a pourable, non-shrink, 100 percent solids system. The epoxy grout system shall have three (3) components: resin, hardener, and specially blended aggregate, all premeasured and prepackaged. The resin component shall not contain any non-reactive diluents. Resins containing butyl glycidyl ether (BGE) or other highly volatile and hazardous reactive diluents are not acceptable. Variation of component ratios is not permitted unless specifically recommended by the manufacturer. Manufacturer's instructions shall be printed on each container in which the materials are packaged.
2. The chemical formulation of the epoxy grout shall be that recommended by the manufacturer for the particular application.
3. The mixed epoxy grout system shall have a minimum working life of 45 minutes at 75 degrees F.
4. The epoxy grout shall develop a compressive strength of 5000 psi in 24 hours and 10,000 psi in seven (7) days when tested in accordance with ASTM C 579, Method B. There shall be no shrinkage (zero percent) and a maximum 4.0 percent expansion when tested in accordance with ASTM C 827.

1.6. CEMENT GROUT

- A. Cement Grout: Cement grout shall be composed of one (1) part cement, three (3) parts sand, and the minimum amount of water necessary to obtain the desired consistency. Where needed to match the color of adjacent concrete, white Portland cement shall be blended with regular cement as needed. The minimum compressive strength at twenty-eight (28) days shall be 4000 psi.
- B. Cement shall be as specified in Section 32 13 13, Concrete Paving.

1.7. CONSISTENCY

- A. The consistency of grouts shall be that necessary to completely fill the space to be grouted for the particular application. Dry pack consistency is such that the grout is plastic and moldable but will not flow. Where "dry pack" is specified, it shall mean a grout of that consistency; the type of grout to be used shall be as specified herein for the particular application.

1.8. MEASUREMENT OF INGREDIENTS

- A. Measurements for cement grout shall be made accurately by volume using appropriate containers. Shovel measurement will not be allowed.
- B. Prepackaged grouts shall have ingredients measured by means recommended by the manufacturer.

PART 3 - EXECUTION

1.9. GENERAL

- A. All surface preparation, curing, and protection of cement grout shall be as specified in Section 32 13 13, Concrete Paving. The finish of the grout surface shall match that of the adjacent concrete.
- B. All mixing, surface preparation, handling, placing, consolidation and other means of execution for prepackaged grouts shall be done according to the printed instructions and recommendations of the manufacturer.

1.10. CONSOLIDATION

- A. Grout shall be placed in such a manner, for the consistency necessary for each application, so as to assure that the space to be grouted is completely filled.

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DIVISION 11

EQUIPMENT

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SECTION 11 68 24 - EXTERIOR ATHLETIC EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Include all labor, material, equipment, transportation, and services to install various items as shown on the drawings and herein specified.
2. Furnish and install football goal posts including pad
3. Furnish and install two (2) soccer goals
4. Furnish and install two (2) pair of soccer goal anchors
5. Furnish and install twelve (12) football pylons
6. Furnish and assemble four (4) soccer corner flag assemblies
7. Furnish and install six (6) long jump take-off board assemblies.
8. Furnish and install two (2) vinyl jump pit covers
9. Furnish and install two (2) Pole Vault Boxes, covers and polyurethane plugs
10. Furnish and assemble Combox / Handholes for new and/or existing electrical and low voltage conductors.
11. Furnish and install ball control netting (East "D" Zone).
12. ADDITIVE ALTERNATE #4: Furnish and install ball control netting (West "D" zone)
13. Furnish and install removable track curbing
14. Furnish and install steeplechase water jump

B. Related Sections:

1. 03 30 53 Miscellaneous Cast-In-Place Concrete
2. 32 18 23 Rubberized Track Surfacing

1.2 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Submit for approval: Manufacturer's product information, installation instructions and maintenance recommendations for all components.

1.3 REFERENCES

- A. World Athletics (formerly IAAF)
- B. NCAA Track & Field Rules (Latest edition)
- C. NCAA Soccer Rules and Regulations (Latest edition)

1.3 QUALITY ASSURANCE

A. Dimensional Accuracy

1. It is the Vendors responsibility to insure that the dimensions of any product supplied meet those required by the Reference Standard claimed.
2. Unit Conversion

Where not otherwise stated, 1 meter shall be converted as 3.280839'.

- B. Products must be received in a like new condition. Any materials that are scratched, dented, misshapen, missing parts or otherwise deficient upon unpacking shall be replaced by the vendor within 72 hours of notice by the Contractor.

C. Approved Product Manufacturer Reference;

1. Aluminum Athletic Equipment (AAE) 1-800-523-5471
2. Gill Athletics (Gill) 1-800-637-3090
3. UCS, Inc. (UCS) 1-800-526-4856
4. Sportsfield Specialties, 1-408-659-6055

PART 2 - MATERIALS

2.1 FOOTBALL GOAL POSTS

- A. Anchoring System: Either a ground sleeve or anchor plate system may be utilized, providing a complete assembly for all components including, but limited to:
 1. Ground Sleeve: The ground sleeve shall be constructed of 8 inch outside diameter Schedule 40 galvanized steel pipe. The ground sleeve shall be a minimum of 5 feet long.
 2. Anchor Plate: The anchor plate shall consist of four (4) "J" hook anchor bolts with anchor plate welded to main standard.
 3. Access Frame: Access frame kit shall be furnished including solid and split covers for each goal post assembly.
- B. Main Standard (Gooseneck): The main standard shall be constructed from 6 inch outside diameter Schedule 40 6061-T6 aluminum pipe. The pipe shall be curved to provide an 8 foot horizontal offset from the ground sleeve to the crossbar with a 5 foot radius bend.
- C. Crossbars: The crossbar shall be constructed from minimum 6 inch outside diameter Schedule 40 6061-T6 aluminum pipe. The crossbar shall extend 23'-4" in accordance with the NFSHSA requirements.
- D. Uprights: The upright shall be constructed from minimum 4 inch outside diameter Schedule 40 6061-T6 aluminum pipe. The uprights shall extend 30 feet above the crossbar.
- E. Provide one (1) set round post protector pads for 6" diameter posts. Pads to be 6" thick cylindrically high-density polyurethane foam with rear cut out for fitting onto post. A minimum nylon reinforced vinyl cover is to be provided to completely enclose foam pad with Velcro closure. Pads to be 6' high. Color shall be determined during submittal, with white vertical lettering on respective pad.
- F. Posts, crossbars and uprights to have two-coat catalyzed polyurethane finish. Color to be yellow or white.
- G. Manufacturer Reference: Football Goal Posts to be Aluminum Athletic Equipment #ASG-NCAA-8; Sportsfield Specialties Inc. #GP 830COL, with anchors, ground sleeves and sleeve caps, and access frame kit GPAFIT;

Aluminum Athletic Equipment
4 Portland Road
West Conshohocken, PA 19428
(800) 523-5471

Sportsfield Specialties, Inc.
P.O. Box 231
Delhi, NY 13753
1-888-408-8638

2.2 PORTABLE SOCCER GOALS

- A. General: Soccer goals to be in full compliance with National Collegiate Athletic Association. Goals to provide an 8' x 24' front inside opening. Goals to be portable.

- B. Crossbar and Uprights: The crossbars and uprights shall consist of a single length of 4.5 inch OD 6063 T-5 aluminum D shaped tubing or 4-3/8 inch OD Rams Aluminum tubing.
- C. The goals shall be finished with a white polyester powder coat finish.
- D. Each goal shall have a wheel kit.
- E. All hardware and fasteners shall be stainless steel.
- F. The goals shall include 4mm polyethylene twine nets. Nets shall be secured with removable clips
- G. Warranty: Goals to be warranted by manufacturer for a minimum period of 5 years.
- H. Manufacturer Reference: Kwik Goal 2B2001 Pro Premier European Match Goal with net, Contact (800) 531-4252, or approved equal

2.3 SOCCER GOAL ANCHOR

- A. Unit shall be pre-manufactured unit consisting of an access box, cover and tethering assembly suitable for securing the backbar/backstay of a soccer goal unit. Provide two per goal.
- B. Access box to be fabricated of .125" aluminum and 16 ga. stainless steel.
- C. Cover to be fabricated of .25" aluminum and 3/4" marine plywood.
- D. Tethering to be steel aircraft cable, minimum 1/4" dia. with terminated loops to secure with padlock.
- E. All connections to be welded or secured with stainless steel hardware.
- F. Manufacturer Reference: Soccer Goal Anchor shall be Aluminum Athletic Equipment, Sportsfield Specialties Model SG2S-Custom, or approved equal.
- G. Synthetic Turf Cover to identically match synthetic turf system used for field surfaces.

2.4 PYLON MARKERS

- A. Furnish at each corner of football field end zone and at the inbounds locations, a total of twelve (12) pylons required. The pylon markers furnished shall be weighted base, portable type which will topple over on impact. The pylons to be 4" x 4" x 18" high covered with red-orange vinyl.
- B. Football pylons to be Gilman WP12, Porter 296801, or approved equal.

2.5 CORNER FLAG

- A. Furnish at each corner of soccer field, four (4) weighted soccer flags. The soccer flags shall be weighted base, portable type which will topple over on impact. The soccer flags shall be 70" high and shall meet NCAA requirements.
- B. Soccer pylons to be Gilman WSF, Gill 54603, or approved equal.

2.6 TAKE OFF BOARDS

- A. Unit shall consist of an aluminum tray, 12" x 48" x 2" permanent recess installation in the track and a 2-3/4" thick dual surface board made up of a reversible top layer of 3/4" marine plywood fastened to 1-1/2" thick aluminum channel with replaceable synthetic yellow polyboard material and integrated replaceable plasticene foul board. The exposed aluminum channel shall be covered with 1/2" of beige EPDM rubber granules and polyurethane installed by the rubberized surfacing contractor.
- B. Manufacturer Reference: Take off board trays to be Sportsfield Specialties Model No. LTJTOB12IAAF12"; Gill Model No. 4350-S, with supplemental board, or approved equal. Sportsfield Specialties, 408-728-0482.
- C. Furnish and install three (3) take off boards and trays for each runway as indicated in the plans.

2.7 LONG JUMP PIT COVER

- A. Unit shall be vinyl coated mesh, with 18.5 oz. Reinforced Outdoor Vinyl Wrapped Galvanized Steel Chain Perimeter for Ballast Purposes, High UV Resistance, Various Standard Colors

Available. Unit shall be 31'-6" x 11'-9" (outside/outside), including catcher constructed of modular aluminum components.

- B. Manufacturer's Reference: The cover shall be Sportsfield Specialties Inc. Model SPCVRML11'-9" x 31'-6" SINGLE LAYER MESH. or approved equal. Product is available from:

Sportsfield Specialties, Inc.
P.O. Box 231
Delhi, NY 13753
1-888-408-8638

2.8 POLE VAULT BOX

- A. Pole vault box shall be stainless steel. Box shall meet World Athletics (formerly IAAF) Rule No. 17221 with width 23.62". Pole vault box shall be guaranteed for the products lifetime.
- B. Pole vault box cover shall be stainless steel to fit and match box. New rubberized surfacing shall be applied to the top surface of the cover.
- C. Manufacturer Reference: Vault boxes shall be Aluminum Athletic Equipment Model SSVB; Sportsfield Specialties Inc. TFPV002SS or equal. Vault box covers shall be Aluminum Athletic Equipment Model SSVC; Gill Athletics Model 504/50201; Sportsfield Specialties Inc. TFPVC002SS or equal.
- D. Furnish and install two (2) vault box and covers as indicated in the plans. Cover shall include a rubberized surfacing. In addition, a full pour removable rubberized surfacing plug shall be installed within the vault box. Surface to match rubberized runway surface.

2.9 COMBOX

- A. Combox shall be installed where shown. Boxes shall be aluminum with gasketed and bolted cover. The cover shall be recessed forming a deep pocket for the placement of synthetic surfacing materials. This provides a "zero" surface elevation change in the playing surface.
- B. Combox boxes shall be 18" x 30".
- C. There shall be two hand holes built into the cover
- D. Hand hole lids will have a toggle lock.
- E. Combox shall be Sportsfield Specialties, Combox CBTS1830/CBIT 1830 depending upon surfacing condition.
- F. Combox lids shall accommodate either rubberized track surfacing or synthetic turf depending upon specific location.

2.10 BALL CONTROL NETTING

- A. General: Provide 10 ft. ht. ball safety netting system including post sleeve, posts, netting associated attachments.
- B. Posts shall consist of minimum 2" diameter schedule 40 aluminum. Terminal posts shall be minimum 2" dia. Schedule 80 aluminum, painted black.
- C. Netting shall consist of minimum #36 nylon 1-3/4" square mesh net. Color of netting to be black.
- D. Netting shall be configured for separate/removable panels / sections per layout plan.
- E. Manufacturer Reference: Sportsfield Specialties model PFBSS210 or approved equal.

2.11 REMOVABLE TRACK CURBING

- A. Curbing shall be constructed of 2" x 2 inch heavy gauge aluminum tube, 20 ft. in length. Each section shall be notched at one end.
- B. Curbing shall be supported by 1/2" tall ribbed feet, and shall include removable pins.
- C. Units shall be powder coated white.
- D. Fabricated to fit on inside lane line, measured and certified in coordination and compliance with Section 32 1823 Track Rubberized Surfacing, Track Certification.

- E. Manufacturer's Reference: Gill Athletics #852P Powder Coated Curbing- Non-Permanent Installation with 851P pins; Sportsfield Specialties TCBP Powder Coated Finish Aluminum Track Curbing.

2.12 STEEPLECHASE EQUIPMENT

- A. Selected Steeplechase equipment supplier will be responsible for providing all necessary equipment to support the construction of the Steeplechase and water jump facilities including water jump pit/pit form, covers, and hurdles.
- B. Provide Steeplechase Hurdles as a package including 3 at 4m and 1 at 5m width.
- C. Provide Water Jump Pit Covers recessed for installation of synthetic track surfacing by others.
- D. Provide additional pricing for mobility kit, wheels, or carts for Steeplechase Hurdles if available.
- E. All Equipment meets or exceeds NCAA Rule 1, Section 3, Article 5 and all Articles of Rule 2, Section 3.
- F. UCS, or approved equal
 1. Water Jump Form model 506-6000
 2. Water Jump Cover System model 506-5420
 3. Water Jump Hurdle & Seal model 506-5413 (Seal model 506-5419)
 4. Steeple Chase Hurdles, package, model 506-5419
- G. Sportsfield Specialties, or approved equal
 1. Modular Water Jump Pit Assembly SCWJFS50 including all components and appurtenances required
 2. Water Jump Pit Panel Cover Set SCWJCVR
 3. Water jump pit hurdle SCWJH – Ground Sleeve
 4. Stationary hurdles SCHS

PART 3 - EXECUTION

3.1 FOOTBALL GOAL POST INSTALLATION

- A. Construct goal post footings as shown on the drawings complete with sleeve inserts or anchor plates as recommended by the manufacturer.
- B. Locate footings and sleeve inserts as shown to provide proper horizontal and transverse alignment of crossbar 10' directly above and parallel to inside edge of end zone.
- C. Provide temporary support when setting goal posts.
- D. The Contractor shall prime and repaint any areas of the goal posts damaged during delivery of installation.

3.2 PORTABLE SOCCER GOAL

- A. Assemble soccer goal per manufacturer's installation instructions.
- B. Install new goal nets per manufacturer's installation instructions.
- C. Secure to anchor system.

3.3 SOCCER GOAL ANCHOR

- A. Assemble soccer goal anchor per manufacturer's installation instructions.
- B. Secure to concrete foundation.
- C. Unit shall be pre-manufactured unit consisting of an access box, cover and clamping assembly suitable for securing the backbar of a soccer goal unit.

3.4 TAKE OFF BOARD INSTALLATION

- A. Install two take off boards at each runway, (four total) as dimensioned and detailed on the drawings.
- B. Install take off boards and trays recessed so that the board is flush with surface of the concrete paving. Rubberized surface is to be applied to aluminum side of board. Rubberized to be cut with sharp edges producing 1/16" clearance between board and runway surfacing.
- C. All boards to be notched at each end at centerline of board to facilitate removal from tray.

3.5 POLE VAULT BOXES AND CONCRETE SLABS

- A. Install vault boxes in concrete in as shown on the detail drawings. Construct 4' x 5' x 12" concrete pads with specified aluminum vault box insert. Top of vault box insert to match level of rubberized surface. Top of concrete to slope away from vault box to match the surrounding grade as applicable.
- B. Measuring line at bottom of vault box shall be aligned with the centerline of the support slabs for the upright standards as shown on the detail drawings.
- C. Slabs: Install 36" x 6' x 12" concrete vault support slabs for upright standards as shown on the drawings. Align centerline of slab with measuring line of vault box as shown on the detail drawings. Edges of slab shall be flush with the surrounding finish grade.

3.6 COMBOX INSTALLATION

- A. Each conduit entering the box shall be neatly upswept and shall terminate not less than 5 inches or more than 10" below the lid.
- B. All boxes shall be set on a 6" free draining pea gravel base and be leveled to match grade. The lid shall be set flush with finish grade. Conduits into the boxes shall have bell ends installed and pull ropes installed.
- C. The combox shall be installed immediately inside the running track on the field side of the slot drain.
- D. The hand holes shall be installed outside the perimeter of the running track in the concrete paving or landscape areas as shown.

3.7 BALL CONTROL NETTING

- A. Assemble and install post sleeves, sleeves and hardware per manufacturer's installation instructions.
- B. Install new netting and retaining system per manufacturer's instructions. Rigging shall be configured to allow removal of specific sections at pole vault landing area while retaining remaining system.
- C. Provide assembly and storage instructions and demonstrate operation to owner's maintenance personnel.
- D. Base Bid shall including ball control netting at east "D" zone. ADDITIVE ALTERNATE #4, shall include ball control netting at west "D" zone.

3.8 REMOVABLE TRACK CURB

- A. Receive on site and assemble equipment.
- B. Layout and install in accordance with track striping drawings exact dimensions and distances. Fabricated to fit on inside lane line, measured and certified in coordination and compliance with Section 32 1823 Track Rubberized Surfacing, Track Certification.
- C. Demonstrate assembly and storage with owner's representative.

3.9 STEEPLECHASE WATER JUMP

- A. Receive on site and assemble equipment.

- B. Demonstrate assembly and storage with owner's representative.

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DIVISION 26
ELECTRICAL

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SECTION 26 05 00 - COMMON WORK RESULTS FOR ELECTRICAL

PART 1 – GENERAL

1.1 SCOPE OF WORK

- A. Contractor to provide labor, materials, equipment, transportation and perform operations necessary or incidental to the proper execution and completion of the electrical work, whether specifically mentioned or not, and as directly indicated or reasonably implied by the Drawings and Specifications.

1.2 COORDINATION

- A. Coordinate with the other trades who may or may not be party to this Contract for the purpose of coordinating the electrical requirements and installation of equipment, materials, and furnishings provided by those other trades, including the Owner.

1.3 CODES AND STANDARDS

- A. Provide equipment and materials which conform to, and perform the installation thereof in accordance with the following codes and industry standards. The applicable version of each shall be that in effect as of the date of the Contract:
 - 1. California Electrical Code (CEC).
 - 2. Titles 8, 19 and 24 of the California Code of Regulations (CCR).
 - 3. American National Standards Institute (ANSI).
 - 4. California State Fire Marshal (CSFM).
 - 5. Underwriters' Laboratories (UL).
 - 6. National Electrical Manufacturers' Association (NEMA).
 - a. Institute of Electrical and Electronics Engineers (IEEE).
 - 1) National Electrical Safety Code (NESC).
 - a) Electrical Safety Orders.
 - b) Other applicable local codes and ordinances.
- B. Where the authority-having-jurisdiction makes an interpretation or decision, as is their prerogative in accordance with the Code, such direction shall be considered a part of these Contract Documents as if contained herein. With respect to completing the intent of the Contract Documents, comply with any and all requirements of the authority-having-jurisdiction and utility company field inspectors, at no additional cost.
- C. The above referenced codes and standards are considered to be absolute minimum requirements. The Drawings and Specifications shall take precedence over the above referenced codes and standards where materials or workmanship of higher quality or larger size is indicated. Nothing in these Drawings or Specifications shall be construed to allow work not conforming to the applicable codes and standards.

1.4 REVIEW OF CONTRACT DOCUMENTS

- A. Examine all relevant Contract Documents including Drawings, Specifications, and Shop Drawings in order to become acquainted with the Work of other installers whose activities will adjoin or be affected by the Electrical Work.

1.5 PERMITS, LICENSES, AND FEES

- A. Contractor to Procure and pay for all permits, licenses and fees that are required to carry out and complete the Electrical Work.
- B. Contractor to Pay for building department or utility company imposed inspection fees.
- C. Contractor to Pay utility company charges for normal or after hours shutdowns, service calls, repairs, and cable locating that are directly related to the installation of the Electrical Work.

1.6 SITE VERIFICATION OF INFORMATION

- A. Visit the project site prior to submitting a bid and verify the condition, location and dimensions of buildings, equipment, and facilities. Become acquainted with conditions under which the Work is to be performed and which may affect the cost thereof.
- B. Verify at the project site, the accuracy of information shown on the Drawings regarding existing equipment, materials, and facilities. This includes but is not limited to: size, type, rating, quality, age, and serviceability. No allowance will be made on behalf of the Contractor for extra expenses resulting from the failure to discover conditions affecting the Work.

1.7 WORKING SPACE

- A. Maintain adequate work space around, and access to, electrical and mechanical equipment in strict accordance with the applicable Codes. Verify during the course of construction that sufficient space will be available for the installation equipment, fixtures, etc.

1.8 MATERIALS AND SUBSTITUTIONS

- A. Materials shall be new, high quality, free from defects, of standard make, and of the brand or grade as shown on the Drawings or specified herein. Specific trade names are used in the Drawings and Specifications in order to establish the standard grade and characteristics of said items. This does not imply the right upon the part of the Contractor to use other materials or methods without the approval of the Architect.
- B. Electrical materials and equipment shall bear the label of, or be listed by, the Underwriters' Laboratories (UL) wherever standards have been established and label service is regularly furnished by that agency. Comply with the installation and application requirements of UL as documented in their published directories.
- C. Unless specifically noted, equipment and systems shall be the product of a manufacturer who has been in the manufacture of, and has nationally distributed catalogs covering the ratings and specifications of, said equipment or systems, for a period of not less than five (5) years.
- D. Maintain uniformity throughout the Project by making use of only one make or brand of material for each material used.
- E. Substitutions of materials or methods will only be allowed if such items are approved in writing by the Engineer as equal in quality and utility to the specified items. Submit a list of proposed substitutions within ten (10) days of the award of the Contract. Include on the list the original manufacturer's name and model number, the proposed manufacturer's name and model number, catalog cut sheets, ratings, sizes, performance curves, shop drawings, and other data as may be required to demonstrate equality to the specified item.
- F. The approval of a substitution does not authorize any deviation from the utility, size, function, or durability of the specified item unless specifically pointed out and requested in the proposed substitution list, and said deviation is approved in writing by the Engineer. Responsibility of the Contractor for dimensional considerations or space conflicts is not relieved by the approval of a substitution.
- G. If requested by the Engineer, submit samples of materials and equipment for approval prior to installation.

1.9 SUBMITTALS

- A. See the General Conditions for conditions of submittal approval and general requirements for submission of shop drawings.
- B. Submit a minimum of five copies (or more as required by the General Conditions) of electrical shop drawings and manufacturer's cut sheets for equipment and materials as noted in each electrical specification section. Bind the submittals as complete volumes according to classification of equipment such as power, lighting, fire alarm, etc. When possible, make all electrical submittals at the same time.
- C. Submit shop drawings and supporting data as instruments of the Contractor. Stamp each item in the submittal documents with the Contractor's stamp, thereby stating that the equipment meets all requirements and conditions of the Drawings and Specifications. In particular, certify that the items shown on the shop drawings conform to the dimensional, environmental, and space restrictions as pertains to all work under this Contract and the work of other parties in conjunction with this Project.
- D. Provide a blank space on the title page of each submittal classification for the Engineer's or Engineers approval stamp and comment field. The minimum size of such space shall be eight inches wide by five inches high.
- E. Arrange panelboard submittals to show bussing, circuit numbering, and branch circuit protective devices similar the schedules on the Drawings. Show elevations of switchboards, motor control centers, and distribution centers indicating the layout of devices, meters, handles, etc. Provide device ratings, circuit numbers, and nameplate descriptions in table form. Include terminal strip mounting arrangements on elevations for terminal cabinets.

1.10 DRAWINGS AND SPECIFICATIONS

- A. The data and information contained on the Drawings is as accurate as was reasonably possible at the time they were produced, but absolute accuracy is not guaranteed. Exact locations, distances, elevations, etc., will be dictated by the actual building and the conditions at the site.
- B. The layout of electrical equipment, wiring, and accessories is shown in a diagrammatic fashion (not pictorially) in order to achieve clarity and legibility. Although the size and location of electrical equipment is drawn to scale wherever possible, refer to all data in the Contract Documents and field verify this information as the project progresses. Examine architectural, structural, mechanical, and other drawings to determine the exact location of conduits, outlets, fixtures, and equipment and to note any conditions which may affect the electrical work.
- C. The Drawings and Specifications may be superseded by later detail drawings and specifications prepared by the Engineer. Conform to such detail drawings, specifications, addenda, change orders, other reasonable changes as if they are contained herein. See the General Conditions for change order cost considerations.
- D. Because the Electrical Drawings may be distorted for clarity of representation, it may be necessary to field verify the exact location of electrical outlets, lights, switches, etc. in order to conform to the architectural elements. The Engineer reserves the right to make minor changes to the locations of equipment, devices, and wiring shown on the Drawings, at no additional cost, providing the changes are ordered before the rough-in of conduit, boxes, or related items is completed, and no extra material are required.
- E. For dimensional and locational purposes, the Architectural Drawings take precedence over the Electrical Drawings. Determine the appropriate location of lighting fixtures, outlets, wall-mounted devices, etc. by studying the reflected ceiling plans, building sections, and interior elevations. Report conflicting conditions to the Engineer before rough-in for adjustments to the locations.
- F. Conduit quantities, sizes, termination points, and wiring are depicted on the Electrical Drawings. However, not all conduit bends or routing details are necessarily shown. Route conduit so as to conform to the structural conditions, avoid obstructing other trades, maintain space restrictions and keep circulation areas and access openings clear.
- G. Thoroughly examine the Contract Documents prior to submitting a bid in order to determine electrical requirements which are not necessarily indicated on the Electrical Drawings. Include sufficient allowance in the bid sum to cover the costs of these other requirements.

- H. Should the Contractor perceive that the Drawings and Specifications do not sufficiently define the intent of electrical work, contact the Engineer for clarification or additional information. The absence of such contact will be considered as evidence of understanding, on the part of the Contractor, of the intended Electrical Work and the required installation thereof.

1.11 WORKMANSHIP

- A. Constantly supervise the work personally or through an authorized and competent representative. Keep the same foreman or supervisor on the project from commencement through completion.
- B. Perform the Electrical work using the highest caliber craftsman available. Workmanship shall be first class and of the best quality available to insure a long and trouble free service life. Allow only experienced and competent workmen on the job.

1.12 COOPERATION AND COORDINATION

- A. Consult with the other installers and trades in coordinating the Work so as to avoid conflicts, omissions and delays. Cooperate with other contractors, third parties, and the Owner in order to expedite the project and provide for the proper execution of the work. Work performed without regard to other trades or the overall project scheme, may necessarily be required to be moved at the Contractor's expense.

1.13 MANUFACTURER'S DIRECTIONS

- A. Adhere to the manufacturer's directions regarding the proper installation and configuration of electrical equipment where those directions cover points not included in these Drawings and Specifications.

1.14 PROTECTION AND STORAGE

- A. Deliver electrical materials to the site new, and in unbroken packages. Provide for the temporary storage of such materials, equipment, and construction tools in accordance with the General Conditions. Protect electrical equipment and materials during transit, storage and handling to prevent damage, soiling and deterioration.
- B. During shipping storage and handling protect electrical materials from damage of any type including dust, water, over-spray, and temperature. Avoid damage during construction to the work and materials of other trades as well as the electrical work and material. Repair or replace, at the Contractor's expense, defective or damaged items such that the entire Work is completed in a condition satisfactory to the Engineer.

1.15 EXCAVATION, CUTTING, PATCHING, AND REPAIR

- A. Cut, core-drill, and demolish existing walls, floors, ceilings and other building surfaces as required for the installation of Electrical Work. Obtain the approval of the Engineer prior to performing any operation which may affect any structural elements of the building.
- B. Patch and repair wood, plaster, tile, or concrete surfaces which have been damaged by the installation of the Electrical Work so that the finished surface matches the surrounding conditions.

1.16 FLASHING, WATERPROOFING, SEALING, AND FIREPROOFING

- A. In general, install in an approved watertight manner, Electrical Work which pierces exterior walls or waterproofing membranes. Flash and counter-flash roof and wall penetrations in a manner described in other applicable sections of this Specification and as approved by the Engineer.

- B. Fit conduits passing through finished walls with steel escutcheon plates of brass, chrome, or painted finish as directed by the Engineer. Grout penetrations of floor slabs, concrete or masonry walls with an approved grout or silicone elastomeric caulk.
- C. Fire-Rated Surface:
 - 1. Where conduit penetrates fire rated surface, install fire-stopping product in accordance with manufacturer's published instructions.
 - 2. All openings through fire rated wall, floor, ceiling or roof must be sealed.
 - 3. Install galvanized sheet metal sleeves (minimum 12-gage) through opening and extending beyond minimum of one (1) inch on each side of building element.
 - 4. Pack void between sleeve and building element with backing material.
 - 5. Seal ends of sleeve with UL listed fire-resistive silicone compound to meet fire rating of structure penetrated.
- D. Non-Rated Surfaces:
 - 1. Opening through a non-fire rated wall, floor, ceiling or roof must be sealed using an approved type of material.
 - 2. Use galvanized sheet metal sleeves in hollow wall penetrations to provide a backing for the sealant. Grout area around sleeve in masonry construction.
 - 3. Install escutcheons or floor/ceiling plates where raceway, penetrates non-fire rated surfaces in occupied spaces.
 - 4. Install rubber links of mechanical seal tightened in place and sized for the pipe, in exterior wall openings below grade, in accordance with the manufacturer's instructions.
 - 5. All pipe penetrations at interior partitions and/or walls, laboratory spaces, telephone, data and communication rooms and similar spaces where the room pressure or odor transmission must be controlled, shall be sealed. Sealant shall be applied to both sides of the penetration in such a manner that the annular space between the pipe sleeve and the pipe is completely filled.

1.17 CLEANING, ADJUSTING, AND TOUCH-UP

- A. Remove on a daily basis electrical debris, scraps, packaging material and other rubbish. Dispose of such items off-site in an approved manner and debris. Maintain the site free from physical hazards at all times in accordance with OSHA regulations. See the General Conditions for additional requirements.
- B. After installation, completely clean electrical equipment, fixtures, and materials of excess paint, over-spray, plaster, cement, insulating products, and other foreign matter. Leave the Electrical Work in a clean, finished, dry, level, like new condition.
- C. Touch-up paint scratches and scuffs on electrical equipment and lighting fixtures with paint recommended by the manufacturer and matching the original item finish.
- D. Make setting, adjustments, and programming in accordance with the manufactures' operating and installation instructions. Settings and program variables will be issued by the Engineer prior to commissioning of the electrical system.

1.18 AS-BUILT DRAWINGS

- A. Throughout the project, maintain accurate and current record documents. Show on the record drawings deviations from the Electrical Drawings, locations of underground conduits and pull-boxes, and concealed equipment which is not readily apparent. Dimension the record drawings using permanent, readily identified benchmarks such as column or wall lines.
- B. At the completion of the project, present one clearly legible set of the record drawings to the Engineer.

1.19 INSPECTIONS AND TESTING

- A. Arrange for the inspection of the Work at various stages of completion by the Authority Having Jurisdiction, utility company representatives, and the Engineer. Comply with all directions and remedial measures issued thereby. Any objections to these orders on the part of the Contractor must be presented to the Engineer in writing within forty eight (48) hours of the inspection report.
 - B. Coordinate the installation of the Work so that observation of all rough-in, concealed, or underground Work can take place by the Engineer. Provide a minimum of seventy two (72) hours notice to the Engineer prior to covering up the work. Uncover Work that has not been properly observed and make repairs to restore the Work and adjoining surfaces to their proper condition at no additional cost.
 - C. Perform tests of the electrical system during the course of the project and at project completion to ensure safe and proper function in accordance with the Contract Documents, manufacturers' recommendations, and applicable codes. Provide complete documentation of all test results to the Engineer prior to project completion. Testing shall include, but not necessarily be limited to, the following:
 - 1. Test for short circuits, open circuits, neutral leakage, and improper grounds on feeders and branch circuits. Perform this test with mains in disconnect from feeders, branch circuits closed, fixtures and devices permanently connected, lamps removed from sockets and wall switches closed.
 - 2. Provide insulation resistance tests of all phase and neutral circuit conductors using a 500 Volt Megger for circuits of 240 Volt rating and below, and a 1000 Volt Megger for circuits of 277 volts and above. Minimum acceptable insulation resistance is one (1) megohm.
 - 3. Perform a ground resistance test of each main grounding electrode system, ground rod, and supplemental grounding electrode. Utilize a calibrated, direct reading, earth ground test set and make the tests using the "Three-terminal, Fall-of-Potential" method. The maximum allowable earth ground resistance is 25 ohms.
 - 4. Test for proper phase-to-phase and phase-to-neutral operating voltage on the main service and on each separately derived system. Perform this test at full load and at no load. With all circuits at full operating conditions, test the phase and neutral load currents using a clamp-on ammeter.
 - 5. Tests as required by other sections of these Specifications.
 - 6. Tests as prescribed by individual equipment manufacturers whether or not described in these Specifications.
 - D. At project completion, demonstrate to the Engineer that the entire installation is complete, in proper operation condition and that the Contract has been properly and fully executed. Activate all circuits, lights, devices, and controls under full load and normal operating conditions. Identify faulty items and immediately replace or repair defective equipment, workmanship, and materials to like new condition and retest in the presence of the Engineer.
 - E. At the completion of the Project, demonstrate to the Engineer that the entire electrical system is free from short circuits and improper grounds, or upon request of the Engineer anytime, make necessary tests under the observation of the Engineer which will ensure that electrical equipment, materials and installation methods are as specified.
- 1.20 GUARANTEE
- A. In accordance with Division 1 requirements.
- 1.21 WARRANTIES, CERTIFICATES, AND OPERATING MANUALS
- A. Properly fill out and deliver to the Engineer, all warranties, guarantees, certificates, etc. for equipment and materials that are furnished and installed under this Section of the Work. The effective date on each item shall be the date of acceptance of the work by the Owner.

- B. Deliver to the Engineer, a minimum of two (2) copies of the manufacturers' operating and maintenance manuals for major items of equipment.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

Not used.

END OF SECTION

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SECTION 26 05 19 - 600-VOLT POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Labor, material, tools, equipment and services required to install building wire and cable, service entrance cable, control cables, wiring connectors and connections.
 - 1. All circuits shall be installed in conduit unless specifically noted otherwise on the drawings. Type MC or AC cable shall not be used on this project.
- B. Unless otherwise noted, the Contractor shall provide all materials, equipment, and labor necessary to produce finished Work as shown on the Drawings and as specified herein.

1.2 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

- A. ASTM B 3 Soft or Annealed Copper Wire
- B. ASTM B 496 Compact Round Concentric-Lay-Stranded Copper Conductors
- C. ASTM B 8 Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft
- D. ANSI C 2 National Electrical Safety Code – latest edition
- E. IEEE 242 Recommended Practice for Protection and Coordination of Industrial and Commercial Power Systems.
- F. IEEE 399 Recommend Practice for Industrial and Commercial Power System Analysis.
- G. NECA (National Electrical Contractors Association) - Standard of Installation.
- H. NEMA WC-26 Wire and Cable Packaging
- I. NETA ATS National Electrical Testing Association Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.
- J. NFPA 70 National Electrical Code – latest edition.
- K. UL 83 Thermoplastic-Insulated Wires and Cables.
- L. UL 486A Wire Connectors and Soldering Lugs for Use with Copper Conductors.
- M. UL 510 Polyvinyl Chloride, Polyethylene and Rubber Insulating Tapes.

1.3 SYSTEM DESCRIPTION

- A. The applications for cable, wire and connectors required, but not limited to, are as follows:
 - 1. Power distribution circuitry.
 - 2. Lighting circuitry.
 - 3. Appliance and equipment circuitry.
 - 4. Wiring for motors of mechanical equipment
 - 5. Wiring from the motor(s) of mechanical equipment to the disconnect switches or junction boxes, including wiring for pushbuttons, pilot lights, interlocks and similar devices as directed, shown, or specified.
 - 6. Wiring from the motors of mechanical equipment to motor starters, including other auxiliary wiring as may be required, directed, or shown.
 - 7. Line voltage wiring as required by other Divisions 2 thru 15, and interlocking to motor starters.
 - 8. Control wiring for motors, mechanical equipment, relays and switches, and similar mechanical-electrical devices.
 - 9. Line voltage wiring to thermostats, alarm systems and other miscellaneous equipment.

1.4 PROJECT CONDITIONS

- A. All wire and cables shall be minimum No. 12 AWG copper conductor unless otherwise shown on drawings.
- B. All conductor sizes are based on copper.
- C. Wire and cable routing shown on Drawings is diagrammatic unless dimensioned.
- D. Route wire and cable as required to accommodate project conditions.
- E. The contractor shall be responsible for any and all raceways and raceway/cable supports in accordance with all other sections of these specifications.

1.5 REGULATORY REQUIREMENTS

- A. Furnish products listed and classified by Underwriters Laboratories, Inc. (UL), Electrical Testing Laboratories, Inc. (ETL), or other recognized, acceptable testing and listing agencies as suitable for the purpose specified and shown.

1.6 SUBMITTALS

- A. Product Data:
 - 1. Submit manufacturer's catalog cuts and technical data for building wire and cables.
- B. Field Test Report:
 - 1. Measure overall insulation resistance to ground. Provide certified test report for Engineer's Review.

1.7 CLOSEOUT SUBMITTALS

- A. Provide project record documents showing actual locations of components and circuits.
- B. Submit final certified test reports of all insulation resistance tests.

1.8 QUALIFICATIONS

- A. Manufacturer shall be a Company specializing in manufacturing products specified in this section with a minimum of five (5) years' experience.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, protect, and handle products on site in accordance with Division 1 requirements.
- B. Accept cable and accessories on site in manufacturer's packaging. Inspect for damage.
- C. Store and protect cable and accessories from the environment in accordance with manufacturer's published instructions. Provide adequate heating and ventilation to prevent condensation.
- D. Damaged items shall be replaced at no additional cost to Owner.

1.10 COORDINATION

- A. Where wire and cable destination is indicated and routing is not shown, determine exact routing and lengths required.
- B. Wire and cable routing indicated is approximate unless dimensioned. Include wire and cable lengths within 10 feet of length shown.

PART 2 - PRODUCTS

2.1 MANUFACTURERS:

- A. Domestic manufacturer regularly engaged in the manufacture of Building Wire and Cable products for at least five (5) years as follows:
 - 1. American Wire and Cable.
 - 2. Cerro Wire and Cable Co.
 - 3. General Cable Corp.
 - 4. Okonite Co.
 - 5. Or Approved Equal.

2.2 BUILDING WIRE AND CABLE

- A. Building wire and cable shall be UL83 compliant, insulated, single conductor, copper, solid or stranded, rated for 600-volts AC. The insulation shall be thermoplastic material rated for 90 degrees Celsius dry locations, 75 or 90 degrees Celsius wet locations, THW, THHN/THWN, RHW or XHHW, per ANSI/NFPA 70.
- B. For Interior Dry Location: Use only building wire, THHN/THWN insulation rated 90 degree Celsius, in raceway.
- C. For Exterior Wet or Dry Locations: Use THHN/THWN-2 or XHHW insulation rated for 90 degree Celsius, in raceway.
- D. For Underground Dry or Wet Locations: Use THHN/THWN-2 or XHHW insulation rated 90 degree Celsius, in raceway.
- E. For connections to electrical equipment, coordinate wire type with equipment manufacturer.

2.3 SERVICE ENTRANCE CABLES

- A. Service entrance cables shall be insulated, single conductor, copper, stranded, rated for 600-volts AC, type XHHW insulation.
- B. Overhead Service entrance cables shall be insulated, single conductor, copper, stranded, rated for 600-volts AC, type SE insulation.

2.4 WIRING CONNECTORS

- A. Split Bolt Connectors:
 - 1. FCI Burndy Corp.
 - 2. Cooper Crouse Hinds.
 - 3. O.Z./Gedney Co.
 - 4. Thomas & Betts Co.
 - 5. 3-M Co.
- B. Solderless Pressure Connectors:
 - 1. FCI Burndy Corp.
 - 2. Ideal Industries Co.
 - 3. Thomas & Betts Co.
 - 4. 3-M Co.
- C. Spring Wire Connectors:
 - 1. Ideal Industries Co.
 - 2. 3-M Co.
- D. Compression Connectors:
 - 1. FCI Burndy Corp.

2. Thomas & Betts Co.
3. 3-M Co.

2.5 WIRE COLOR CODE

- A. Color-code all conductors:
1. Wire sizes No. 10 AWG and smaller shall have integral color-coded insulation.
 2. Wire sizes No. 8 AWG and larger may have black insulation but shall be identified by color-coded electrical tape at all junction, splice, pull, or termination points.
 3. Color tape shall be applied to at least 3 inches of the conductor at the termination ends and in junction or pull boxes or where readily accessible.
 4. Conductors for all systems shall not change color at splice points.
 5. Where there are two or more neutrals in one conduit, each shall be individually identified with the proper circuit.
 6. For No. 4 AWG and larger ground conductors, identify with green tape at both ends and all visible points, included in all junction boxes.
- B. Each phase wire shall be uniquely color-coded as indicated below:
1. 120/240-Volts
 - a. Phase A – Black
 - b. Phase B – Red
 - c. Neutral - White
 - d. Ground - Green
 2. 120/208-Volts
 - a. Phase A – Black
 - b. Phase B – Red
 - c. Phase C – Blue
 - d. Neutral – White
 - e. Ground – Green
 3. 277/480-Volts
 - a. Phase A - Brown
 - b. Phase B - Orange
 - c. Phase C – Yellow
 - d. Neutral - White or Natural Gray
 - e. Ground – Green
 4. Isolated Grounds: Green with Yellow Stripes

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that interior of building has been protected from weather.
- B. Verify that mechanical work likely to damage wire and cable has been completed.
- C. Verify that raceway installation is complete and supported as required by the specifications.

3.2 PREPARATION

- A. Test raceway with a mandrel and thoroughly swab out to remove foreign material before pulling cables.
- B. For conduits sizes less than 3 inches, draw a stiff bristle brush through until conduit is clear of particles of earth, sand and gravel.
- C. For conduits sizes 3 inches and larger, draw a flexible testing mandrel approximately 12 inches long with a diameter less than the inside diameter of the conduit through the conduit. Then draw a stiff bristle brush through until conduit is clear of particles of earth, sand and gravel.

3.3 EXISTING WORK

- A. Disconnect and remove exposed and/or abandoned wire and cable. Patch surfaces where removed cable pass through building finishes.
- B. Disconnect abandoned circuits and remove wire and cable. Remove abandoned boxes if wire and cable servicing them is abandoned and/or removed. Provide blank cover for abandoned boxes that are not removed.
- C. Ensure access to existing wiring connections which remain active and which require access. Modify installation or provide access panel as appropriate.
- D. Extend existing circuits using materials and methods and compatible with existing electrical installations, or as otherwise specified.
- E. Tag and repair existing wire and cable that remain or are being reused.

3.4 INSTALLATION

- A. General:
 - 1. Install wire and cable in accordance with manufacturer's instructions and NECA "Standard of Installation".
 - 2. Route wire and cable as required to meet project conditions.
 - 3. Identify and color code wire and cable. Identify each conductor with its circuit number or other designation indicated.
 - 4. Protect exposed cable from damage.
 - 5. Pull all conductors into raceway at same time.
 - 6. Use suitable wire pulling lubricant for building wire No. 4 AWG and larger. Lubricant shall not be deleterious to the cable sheath, jacket or outer covering.
 - 7. Do not exceed cable manufacturer's recommended pulling tension limits when installing wire or cable.
 - 8. Support cables above accessible ceiling using standard support methods to support cables from structure. Do not rest cable on ceiling panels.
 - 9. Neatly train and lace wiring inside boxes, equipment, and panelboards
- B. Cable and Wire Size:
 - 1. Conductor sizes are based on copper unless specifically indicated as aluminum or "AL".
 - 2. Use conductor no smaller than No. 12 AWG for power and lighting circuits.
 - 3. Use conductor no smaller than No. 14 AWG for control circuits.
 - 4. Use No. 10 AWG conductors for 20 ampere, 120-volt branch circuits longer than 75 feet.
 - 5. Use No. 10 AWG conductors for 20 ampere, 277-volt branch circuits longer than 200 feet.
 - 6. Use stranded conductor for all feeders, branch and control circuits.
- C. Cable Identification
 - 1. Identify all wires and cables as specified in other Sections of these Specifications.

D. Special Techniques - Wiring Connections:

1. Clean conductor surfaces before installing lugs and connectors. Where an anti-oxidation lubricant is used, apply liberally, coating all exposed conductor surfaces.
2. Use suitable cable fittings and connectors.
3. Make splices, taps, and terminations to carry full ampacity of conductors with no perceptible temperature rise.
4. Use split bolt connectors for copper conductor splices and taps, No. 8 AWG and larger.
5. Use solderless pressure connectors with insulating covers for copper conductor splices and taps, No. 8 AWG and smaller.
6. Tape un-insulated conductors and connector with two layers of half-lapped rubber insulating compound tape and two layers of half-lapped, 7-mil electrical tape, Scotch 33+, or equal.
7. Use insulated spring wire connectors with plastic caps for copper conductor splices and taps, No. 10 AWG and smaller.
8. Stranded conductors for control circuits shall have fork or ring terminals crimped on for all device terminations. Bare stranded conductors shall not be placed directly under the screws.

3.5 FIELD QUALITY CONTROL

A. Field inspection and test shall be performed under provisions of NETA ATS section 7.3 (2) - Low Voltage Cables, 600-Volt Maximum as follows.

1. Visual and Mechanical Inspection:
 - a. Compare cable data with drawings and specifications.
 - b. Inspect exposed sections of cable for physical damage and correct connection in accordance with single-line diagram.
 - c. Inspect all bolted electrical connections for high resistance using one of the following methods:
 - 1) Use of low-resistance ohm-meter in accordance with NETA section 7.3.2.2 (Electrical Tests).
 - 2) Verify tightness of accessible bolted electrical connections by calibrated torque-wrench method in accordance with manufacturer's published data from NETA ATS Table 10.12.
 - d. Inspect compression-applied connectors for correct cable match and indentation.
 - e. Verify cable color coding with applicable specifications and National Electrical Code.
2. Electrical Tests
 - a. Perform insulation-resistance test on each conductor with respect to ground and adjacent conductors. Applied potential shall be 500 volts dc for 300 volt rated cable and 1000 volts dc for 600 volt rated cable. Test duration shall be one minute.
 - b. Perform resistance measurements through all bolted connections with low-resistance ohmmeter, if applicable, in accordance with Section 7.3.2.1 (Visual and Mechanical Inspection).
 - c. Perform continuity test to insure correct cable connection.
 - d. Correct malfunctions and/or deficiencies immediately as detected at no additional cost to the District, including additional verification testing.
 - e. Subsequent to final wire and cable terminations, energize all circuitry and demonstrate functional adequacy in accordance with system requirements.
3. Test Values

- a. Compare bolted connection resistance to values of similar connections.
- b. Bolt-torque levels should be in accordance with NETA ATS Table 10.12 unless otherwise specified by the manufacturer.
- c. Micro-ohm or millivolt drop values shall not exceed the high levels of the normal range as indicated in the manufacturer's published data. If manufacturer's data is not available, investigate any values which deviate from similar connections by more than 50 percent of the lowest value.
- d. Minimum insulation-resistance values should not be less than 50 meg-ohms.
- e. Investigate deviations between adjacent phases.

END OF SECTION

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SECTION 26 05 26 - GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERALS

1.1 SECTION INCLUDES

- A. Furnishing of grounding electrodes and conductors; equipment grounding conductors; bonding methods and materials; conduit and equipment supports; anchors and fasteners; sealing and fireproofing of sleeves and openings between conduits and wall.
- B. Inspection and testing of the Grounding and Bonding System; and Ground-Fault Protection Systems.
- C. Unless otherwise noted, the Contractor shall provide all materials, equipment, and labor necessary to produce finished Work as shown on the Drawings and as specified herein.

1.2 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

- A. The standards referenced herein, except as modified in the Contract Documents, shall have full force and effect as though included in these Specifications. These standards are not furnished to the Contractor since manufacturers and trades involved are assumed to be familiar with these requirements. The Contractor shall obtain copies of reference standards direct from publication sources as needed for proper performance and completion of the work.
 - 1. ASTM B 187 Specifications for Copper Bus, Rod, and Shapes.
 - 2. ASTM A 653 Standard Specifications for Sheet Steel, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by Hot Dip Process
 - 3. IEEE 142 Recommended Practice for Grounding of Industrial and Commercial Power Systems.
 - 4. IEEE 1100 Recommended Practice for Powering and Grounding Electronic Equipment.
 - 5. NECA (National Electrical Contractors Association) – Standard of Installation.
 - 6. NETA ATS Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.
 - 7. NFPA 70 National Electrical Code (NEC). Latest edition adopted by the State of California (CEC).
 - 8. UL 467 Electrical Grounding and Bonding Equipment.

1.3 SYSTEM DESCRIPTION

- A. Grounding electrode systems consist of the following elements:
 - 1. Concrete encased (Ufer) grounding electrodes
 - 2. Other made electrodes
- B. Anchor and fasten electrical products to building elements and finishes as follows:
 - 1. Concrete Structural Elements: Provide preset inserts.
 - 2. Concrete Surfaces: Provide epoxy or expansion anchors.
 - 3. Sheet Metal: Provide sheet metal screws.

1.4 DESIGN REQUIREMENTS

- A. Furnish products listed and classified by Underwriters Laboratories, Inc. (UL), Electrical Testing Laboratories, Inc. (ETL), or other recognized, acceptable testing and listing agencies as suitable for purpose specified and shown.

- B. Grounding shall be in accordance with the National Electrical Code (NEC). Where size, type, rating and quantities indicated or specified are in excess of NEC requirements, the more stringent requirements and the greater size, rating, and quantity indications govern.
- C. Select materials, sizes, and types of anchors, fasteners, and supports to carry at least twice the loads of equipment and raceway, including weight of wire and cable in raceway.

1.5 SUBMITTALS

- A. Product Data:
 - 1. Submit product data for grounding electrodes and connections for fastening components; fire stopping material; and fireproofing sealants.
- B. Test Report:
 - 1. Grounding & Bonding: Provide certified test report for Engineer's Review.
 - 2. Ground-Fault Protection System: Provide certified test report for Engineers Review.

1.6 CLOSEOUT SUBMITTALS

- A. Record actual locations of components and grounding electrodes.
- B. Submit final one (1) electronic copy.
- C. Submit final one (1) electronic copy of the test reports of all grounding tests and ground-fault protection systems.

1.7 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum five (5) years' experience.
- B. Installer: A firm with at least five (5) years of installation experience on projects with electrical grounding work similar to that required for this project.

1.8 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication.
- B. Field testing shall be performed by a third party testing firm with certification from a recognized testing agency, with a minimum of five (5) years of testing experience.

PART 2 - PRODUCTS

2.1 GROUNDING SYSTEM

- A. Except as indicated elsewhere, provide materials for electrical grounding system, including, but not limited to, cables, wires, connectors, terminals (solderless lugs) and exothermic welds, grounding rods and electrodes, bonding jumper and braided straps, and other items and accessories required for a complete installation. Where more than one type of material or equipment meets indicated requirements, selection shall be at Installer's option. Where materials or components are not otherwise indicated, provide products as recommended by the accessories manufacturers and in compliance with the NEC and established industry standards.
- B. All grounding materials required shall be furnished new and undamaged in accordance with the requirements of these specifications:

2.2 WIRE

- A. Service Equipment Grounding Electrode Conductor: Bare, soft-drawn copper, Class AA stranding, ASTM B 8. Size per NEC Table 250-66, unless otherwise noted.
- B. Electrical Equipment Grounding Conductor: Insulated, soft-drawn copper, Class B stranding or solid, with green colored polyvinyl chloride insulation per Section 26 05 19. Size per NEC Article 250-122, unless otherwise noted.

2.3 EXOTHERMIC WELD CONNECTIONS

- A. Exothermic materials, accessories and tools for preparing and making permanent field connections between grounding system components. Molds, cartridges, materials, and accessories as recommended by the manufacturer of the molds for the items to be welded.
- B. Manufacturer:
 - 1. Cadweld (Erico Products) "Exolon" Low Emission. Molds and powder shall be furnished by the same manufacturer.
 - 2. Acceptable equal.

2.4 MECHANICAL CONNECTORS

- A. Mechanical connectors shall be permitted only when exothermic weld connections are not suitable or recommended by the manufacturer.
- B. Bolt-on bronze connectors, suitable for grounding and bonding applications in configurations required for the particular installation.
- C. Manufacturer
 - 1. Burndy Corp.
 - 2. Anderson
 - 3. Thomas & Betts
 - 4. 3-M Co.

2.5 FLEXIBLE JUMPER STRAP

- A. Flexible flat conductor, 480 strands of 30-gauge, bare copper wire; 3/4-inch width, 9-1/2-inch-long; 48.25 kCMil, minimum. Protect braid with copper bolt-hole ends with holes sized for 3/8-inch diameter bolts.

2.6 BONDING PLATES, CONNECTIONS, TERMINALS AND CLAMPS

- A. Provide electrical bonding plates, connectors, terminals and clamps, and accessories as recommended by the manufacturer for the specific applications. Components shall be high-strength, high-conductivity copper alloy.

2.7 GROUNDING WELL COMPONENTS

- A. Well Pipe: 8 inches NPS (DN200) by maximum 12 inches (300-mm) long, precast concrete or fiberglass pipe with belled end.
- B. Well Cover: Cast iron, high impact traffic rated cover with legend "GROUND" embossed on outer face.

2.8 ANCHORS AND FASTENERS

- A. Indoor Locations: Epoxy type anchors and heavy-duty, galvanized steel screws and bolts.
- B. Outdoor Locations: Epoxy type or Red Head anchor bolts and stainless steel screws and bolts.

2.9 SUPPORT CHANNEL

- A. All conduit and electrical equipment support channels for interior, exterior, wet and corrosive areas shall be galvanized steel.
- B. Support channels for free standing electrical equipment such as switchgear, switchboard and motor control centers, shall be:
 - 1. Indoors: galvanized steel channel and hardware, minimum 12 gauge, ASTM A653 Grade 33 sheet steel, zinc coated by hot dip process.
 - 2. Outdoors: 316 Stainless steel

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that abandoned wiring and equipment serve only abandoned facilities.

3.2 EXISTING WORK

- A. Modify existing grounding system to maintain continuity to accommodate renovations.
- B. Extend existing grounding system using materials and methods as specified.
- C. Install temporary wiring and connections to maintain existing grounding systems in service during construction.
- D. Perform work on energized equipment or circuits with experienced and trained personnel following all safety rules and procedures.
- E. Remove, relocate, and extend existing installations to accommodate new construction.
- F. Repair adjacent construction and finishes that are damaged during Demolition and extension work.
- G. Remove exposed and/or abandoned grounding and bonding components, fasteners, supports and electrical identification labels. Cut embedded support elements below surface of walls and floors. Patch surfaces damaged by removal of existing components to match surrounding finishes.

3.3 GROUNDING AND BONDING INSTALLATION:

- A. Verify that final backfill and compaction has been completed before driving rod electrodes.
- B. Install grounding well with cover at rod locations as indicated on Drawings. Install well top flush with finished grade.
- C. Installation:
 - 1. Remove paint, rust, mill-oils, and surface contaminants at connection points.
 - 2. Install grounding electrode conductor and connect to reinforcing steel in slab or foundation.
 - 3. Bond together metal siding not attached to grounded structure; bond to ground.
 - 4. Bond together reinforcing steel and metal accessories.
 - 5. Connect to site grounding system.
 - 6. Install continuous grounding using underground cold water system and building steel as grounding electrode. Where water piping is not available, provide an artificial station ground by means of driven rods or buried electrodes.
 - 7. Permanently ground entire light and power system in accordance with NEC, including service equipment, distribution panels, lighting panel boards, switch and starter enclosures, motor frames, grounding type receptacles, and other exposed non-current carrying metal parts of electrical equipment.
 - 8. Install branch circuits feeding isolated ground receptacles with separate insulated grounding conductor, connected only at isolated ground receptacle, ground terminals, and at ground bus of serving panel in accordance with IEEE 1100.

9. Accomplish grounding of electrical system by installing insulated grounding conductor with each feeder and branch circuit conductor in conduit. Install separate insulated conductor within each feeder and branch circuit raceway. Terminate each end on suitable lug, bus, or bushing. Size grounding conductor in accordance with the NEC.
10. Install grounding conductor from ground bus of serving panel to ground bus of served panel, grounding screw of receptacles, lighting fixture housing, light switch outlet boxes, and metal enclosures of service equipment.
11. Bond all metallic conduits to grounding bus at service panel by means of grounding bushings using minimum No. 12 AWG conductor.
12. Ground electrical system using continuous metal raceway system enclosing circuit conductors in accordance with NEC. Bond together each metallic raceway, pipe, duct and other metal object entering enclosures and exiting slabs.
13. Permanently bond all equipment, grounding conductors, lightning protection system and grounding system prior to energizing equipment.

3.4 GROUND CONDUCTORS

- A. Grounding conductors shall be located and connected as indicated on drawings or as required by Code.
- B. Ground conductors under buildings or structures shall be buried with at least 6 inches of earth cover. Buried grounding conductors extending beyond the foundations of buildings or structures shall have at least 18 inches of earth cover.
- C. Exposed conductors shall be installed inconspicuously in vertical or horizontal positions on supporting structures. When located on irregular supporting surfaces or equipment, the conductors shall run parallel to or normal to dominant surfaces.
- D. Conductors routed over concrete, steel, or equipment surfaces shall be kept in close contact with those surfaces by using fasteners located at intervals not to exceed 3 feet.
- E. Conductors passing through floor slabs shall be installed in conduit sleeves that extend above the floor slab, a minimum of 1-1/2 inches to provide protection. Sleeves shall be sealed to maintain fireproof integrity.
- F. Provide isolated grounding conductor for circuits supplying equipment and systems as shown on the drawings.
- G. Provide a separate equipment-grounding conductor for low voltage distribution systems, single or three phase feeder circuit and each branch circuit with single or three phase protective devices. Install a grounding conductor in conduit with phase and neutral conductors. Single-phase branch circuits for 120 and 277 volt lighting, receptacles, and motors shall have a phase, neutral, and ground conductors installed in the common conduit. Provide suitable bonding jumpers and approved grounding type bushings for flexible conduits used for equipment connection utilized in conjunction with the above branch circuits. Single-phase circuits for equipment and all branch circuits installed in non-metallic or flexible conduits shall be provided with a separate grounding conductor.
- H. Ground the neutral of separately derived systems with a bare copper conductor, installed in conduit, from the neutral directly to the building interior cold water pipe or nearest solidly grounded structural reinforcing steel, in accordance with the provisions of NEC Article 250-24. Use bolted accessible connections to the ground system so that the neutral ground can be disconnected for test. Ground the system ground conduit as detailed on drawing. Size the grounding electrode conductors in accordance with the NEC, Table 250-66, or as indicated.

3.5 CONNECTIONS

- A. All connections shall be made by the exothermic welding process, except where otherwise indicated. The manufacturer's instructions on the use of exothermic welding materials shall be followed in all details. Powder and molds shall be kept dry and warm until use. Worn or damaged molds shall not be used.

- B. All surfaces to be joined by the welds shall be thoroughly cleaned. Paint, scale, and other deleterious substances shall be removed from surfaces of ungalvanized structural steel members by grinding. Galvanized steel surfaces shall be cleaned with emery paper.
- C. All exothermic welded connections shall successfully resist moderate hammer blows. Any connection which fails such test or which, upon inspection, indicates a porous or deformed weld, shall be remade.
- D. All exothermic welds shall encompass 100 percent of the ends of the materials being welded. Welds, which do not meet this requirement, shall be remade.
- E. Worn, damaged, incorrectly sized, or improperly shaped molds which, in the opinion of the Engineer, do not make satisfactory welds, shall be removed from the jobsite after being physically rendered inoperable.
- F. All contact surfaces of bolted and screwed connections shall be thoroughly cleaned and coated with oxide inhibitor before being securely tightened.

3.6 CONDUIT GROUNDING

- A. All grounding bushings within all enclosures, including equipment enclosures, shall be wired together and connected internally to the enclosure grounding lug or grounding bus with a bare copper conductor. Grounding bushings shall be grounded with conductors sized in accordance with NEC, but not smaller than No. 8 AWG.

3.7 EQUIPMENT GROUNDING

- A. Comply with NEC 250, except where larger sizes or more conductors are indicated.
 - 1. All electrical equipment shall be connected to the grounding system with an insulated, green, stranded or solid copper equipment-grounding conductor.
 - 2. Terminate each end on suitable lug, bus, or bushing. The term "electrical equipment", as used in this article, shall include, but not be limited to, all enclosures containing electrical connections or bare conductors, except that individual devices, such as solenoids, pressure switches, and limit switches, shall be exempt from this requirement, unless the device requires grounding for proper operation.
 - 3. Large equipment, such as metal-clad or metal-enclosed switchgear, will be furnished with a grounding bus that shall be connected to the grounding system.
 - 4. Most other equipment will be furnished with grounding pads and/or grounding lugs which shall be connected to the grounding system. All ground connection surfaces shall be cleaned immediately prior to connection.
 - 5. Contractor shall furnish all grounding material required, if not furnished with the equipment.
- B. Install equipment grounding system such that all metallic structures, enclosures, raceways, junction boxes, outlet boxes, cabinets, machine frames, portable equipment and other conductive items in close proximity with electrical circuits will operate continuously at ground potential and provide a low impedance path for possible ground fault currents.
- C. Where grounding system extension stingers are indicated on the drawings to be provided for connection to electrical equipment, the Contractor shall connect the bare grounding conductor to the equipment ground bus, pad, or lug. Except where otherwise indicated on the drawings, all equipment ground conductors that are not an integral part of a cable assembly, shall be sized in accordance with the requirements of NEC. All ground conductors installed in conduit shall be insulated.
- D. Suitable grounding facilities, acceptable to the Engineer, shall be furnished on electrical equipment not so equipped. The grounding facilities shall consist of compression type terminal connectors bolted to the equipment frame or enclosure and providing a minimum of joint resistance.

- E. The conduit system is not considered to be a grounding conductor, except for lighting fixtures. No grounding conductor shall be smaller in size than No. 12 AWG, unless it is a part of an acceptable cable assembly.

3.8 GROUND SYSTEM RESISTANCE

- A. Ground resistance of the system shall be no greater than five (5) ohms.

3.9 ANCHORS, FASTENERS AND SUPPORT

A. Installation:

1. Locate and install anchors, fasteners, and supports in accordance with NECA "Standard of Installation".
2. Do not fasten supports to pipes, ducts, mechanical equipment, or conduit.
3. Do not use spring steel clips and clamps.
4. Do not use powder-actuated anchors.
5. Do not drill or cut structural members.

B. Supports:

1. Fabricate supports from structural steel or formed steel members. Rigidly weld members or install hexagon head bolts to present neat appearance with adequate strength and rigidity. Install spring lock washers under nuts.
2. Install surface-mounted cabinets and panel board with minimum of four (4) anchors.
3. Use steel channel supports to stand cabinets and panel boards one (1) inch off wall.
4. Use sheet metal channel to bridge studs above and below cabinets and panel boards recessed in hollow partitions.

3.10 ACCEPTANCE TESTING

- A. Grounding and Bonding: Perform inspections and tests as outlined below (NETA ATS, Section 7.13 – Grounding Systems).

1. Visual and Mechanical Inspection
 - a. Verify ground system is in compliance with drawings and specifications.
 - b. Electrical Tests
 - c. Perform point-to-point tests to determine the resistance between the main grounding system and all major electrical equipment frames, system neutral, and/or derived neutral points.
2. Test Values
 - a. Investigate point-to-point resistance values which exceed 0.5 ohm.

END OF SECTION

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SECTION 26 05 33 – RACEWAYS AND BOXES

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Conduit and tubing, surface and buried raceways, wireways, outlet boxes, pull boxes, and junction boxes.
- B. Unless otherwise noted, the Contractor shall provide all materials, equipment, and labor necessary to produce finished Work as shown on the Drawings and as specified herein.

1.2 REFERENCES - CODES AND STANDARDS

- A. ANSI C80.1 Rigid Steel Conduit, Zinc Coated.
- B. ANSI C80.3 Electrical Metallic Tubing, Zinc Coated.
- C. ANSI C80.6 American National Standard for Electrical Intermediate Metal Conduit.
- D. ASTM A 48 Standard Specification for Grey Iron Castings.
- E. NECA (National Electrical Contractors Association) – “Standard of Installation.”
- F. NEMA FB 1 (National Electrical Manufacturers Association) – Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies.
- G. NEMA OS 1 (National Electrical Manufacturers Association) – Sheet-steel Outlet Boxes, Device Boxes, Covers, and Box Supports.
- H. NEMA OS 2 (National Electrical Manufacturers Association) – Nonmetallic Outlet Boxes, Device Boxes, Covers and Box Supports.
- I. NEMA TC 2 – Electrical Polyvinyl Chloride (PVC) Conduit.
- J. NEMA TC 3 (National Electrical Manufacturers Association) – PVC Fittings for Use with Rigid PVC Conduit and Tubing.
- K. NEMA TC 6 - Non-Metallic Conduit.
- L. NEMA 250 (National Electrical Manufacturers Association) – Enclosures for Electrical Equipment (1,000 Volts Maximum).
- M. NFPA 70 National Electrical Code (NEC). Latest approved edition
- N. UL 1 Flexible Metal Conduit
- O. UL 6 Rigid Metal Conduit
- P. UL 514B Conduit, Tubing and Cable Fittings.
- Q. UL 651 Rigid Non-Metallic Conduit
- R. UL 797 Electrical Metallic Tubing

1.3 CONDUIT APPLICATION

- A. Acceptable raceway systems and their limitations of use are summarized in the following table:

Location	RSC	RNC	EMT	FMC	LFMC
Exterior locations: Wet or subject to physical damage.	Yes	No	No	No	No (note 2)
Exterior locations: Damp and not subject to physical damage.	Yes	No	No	No	Yes

Interior locations: Wet or subject to physical damage.	Yes	No	No	No	No (note 2)
Interior locations: Exposed and not subject to physical damage.	Yes	No	Yes	Yes (note 4)	Yes
Interior locations: Totally concealed.	Yes	No (note 3)	Yes	Yes (note 4)	Yes
Underground:	Yes	Yes (Note 5)	No	No	No

B. Notes for Conduit Application Table:

1. RSC = rigid steel conduit, RNC = rigid nonmetallic conduit, EMT = electrical metallic tubing, FMC = flexible metal conduit, LFMC = liquidtight flexible metal conduit.
2. For the purposes of these specifications, locations subject to physical damage include, but are not limited to, those areas less than 6 feet above the finished floor or grade.
3. Rigid nonmetallic conduit may also be used above grade, totally concealed in walls, for transitions from underground up to a height of 24 inches above the concrete sill.
4. The use of flexible metal conduit is limited to lengths not exceeding 6 feet for flexible connections to equipment and lighting fixtures, or where necessitated by structural obstacles and explicitly approved by the Engineer.
5. The use of RNC underground is acceptable for horizontal runs and bends not exceeding 45 degrees. For bends over 45 degrees and for 90-degree conduit stub ups, provide RSC with tape wrappings.

1.4 BOX APPLICATION

- A. Provide raceway, boxes and manholes located as indicated and at other locations required for splices, taps, wire pulling, equipment connections, and compliance with regulatory requirements and for a complete wiring system.

1.5 DESIGN REQUIREMENTS

- A. Minimum acceptable conduit sizes (where sizes are note specified on the drawings) are summarized in the following table:

	MINIMUM SIZE
Underground, site wiring	1"

Underground <ul style="list-style-type: none"> • Building wiring 	3/4"
Aboveground <ul style="list-style-type: none"> • Equipment or panel feeders • Telecommunications 	
Aboveground <ul style="list-style-type: none"> • Lighting or branch circuit wiring • Fire alarm • Security 	1/2"
Other	3/4"

1.6 SUBMITTALS

- A. Manufacturer's Installation Instructions: Submit application conditions and limitations of use stipulated by product testing agency having jurisdiction. Include instructions for storage, handling, protection, examination, preparation, and installation of product.
- B. Submit detailed conduit routing plan, for review and approval, prior to installation as follows:
 - 1. Exposed and/or concealed in building walls for conduits larger than 2-inch outside diameter.
 - 2. All underground conduits (3/4-inch and larger) in duct bank; concealed in floor slabs, equipment pads and concrete slabs.
- C. Product Data: Submit for the following:
 - 1. Rigid Steel Conduit.
 - 2. Electrical Metallic Tubing (EMT).
 - 3. Flexible metal conduit.
 - 4. Liquid tight flexible metal conduit.
 - 5. Rigid nonmetallic conduit.
 - 6. Raceway fittings.
 - 7. Conduit bodies.
 - 8. Surface raceway.
 - 9. Pull boxes, junction boxes.
- D. Manufacturer's Installation Instructions:
 - 1. Submit application conditions and limitations of use stipulated by product testing agency specified under Regulatory Requirements.
 - 2. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

1.7 CLOSEOUT SUBMITTALS

- A. Project Record Documents:
 - 1. Record actual routing of conduits. Provide record (as-built) drawings marked in red to show actual routing of the underground raceway and cable when different from the original contract drawings. Prepare on new, clean set of contract drawings.
 - 2. Record actual locations and mounting heights of outlet, pull boxes, junction boxes and manholes.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Protect conduit from corrosion and entrance of debris by storing above grade. Provide appropriate covering.
- B. Protect PVC conduit from sunlight.

PART 2 - PRODUCTS

2.1 CONDUIT

- A. Galvanized Rigid Steel Conduit (GRSC or RGS), couplings and elbows shall be hot-dip galvanized, rigid mild steel in accordance with ANSI C80.1 and UL 6. The conduit interior and exterior surfaces shall have a continuous zinc coating with a transparent overcoat of enamel, lacquer, or zinc chromate. Conduit shall be formed with continuous welded seams with a uniform wall thickness, in minimum 10-foot lengths, with threaded ends.
- B. Electrical Metallic Tubing (EMT). Electrical metallic tubing, including elbows and bends, shall be zinc coated, mild steel in accordance with the requirements of ANSI C80.3 and UL 797. The interior and exterior surfaces of the tubing shall have a continuous zinc coating. Conduit shall be formed with a continuous welded seam, with a uniform wall thickness, in minimum 10-foot lengths.
- C. Flexible Metal Conduit shall be galvanized steel meeting the requirements of UL 1. Flexible aluminum conduit is not permitted.
- D. Liquid-Tight Flexible Metal Conduit shall be plastic-jacketed, galvanized steel, "Sealtite" Type EF for general service areas or Type HC for high-temperature when used under raised floor or in air plenums. Conduit shall be UL listed.
- E. Rigid Non-Metallic Conduit shall be as follows:
 - 1. Schedule 40: Conduit shall be 90 degree Celsius, polyvinyl chloride in conformance with NEMA TC-2 and UL 651 requirements.
 - 2. Spacers used in duct bank installations shall be high impact plastic, interlocking bases, and intermediate type spacers. Place spacers between 6 and 10 feet apart.
- F. Rigid aluminum conduits and flexible aluminum or non-metallic conduits are not permitted on this project.

2.2 RACEWAY FITTINGS

- A. Couplings and Thread Protectors. Each length of threaded conduit shall be provided complete from the manufacturer with a coupling on one end and a thread protector on the other. The thread protector shall have sufficient mechanical strength to protect the threads during normal handling and storage.
- B. Metal Conduit Fittings shall conform to the requirements of UL 514B where this standard applies. Galvanized iron or galvanized steel fittings shall be used with steel conduit. Threaded fittings shall engage a minimum of five threads made up wrench-tight and be compatible with conduit.
- C. EMT Conduit Fittings shall be set screw steel with insulated throat for Indoor applications and compression type, UL approved for rain tight applications for outdoor use. Die-cast or indent style fittings are not acceptable.
- D. Liquid-Tight Flexible Conduit Fittings shall be galvanized steel, T&B 53XX series insulated throat, and shall bear the UL label. Die-cast malleable fittings are not acceptable.
- E. Liquid-Tight Flexible Metal Conduit Fittings shall be galvanized steel similar to T&B "Tite-Bite".
- F. Non-Metallic Conduit Fittings shall be of same material and strength characteristics as the conduit and shall be solvent welded as recommended by manufacturer. End bells shall be plastic, high impact, tapered to fit. Where conduit transition from non-metallic to metallic is required, provide non-metallic female "terminal" adapter. Non-metallic "male" adapters are not acceptable.

- G. Special Fittings. Conduit sealing, explosion proof, dust proof, and other types of special fittings shall be provided as required and shall be consistent with the area and equipment with which they are associated. Fittings installed outdoors or in damp locations shall be sealed and gasketed. Outdoor fittings shall be of heavy cast construction. Hazardous area fittings and conduit sealing shall conform to NEC requirements for the area classification.
- H. Bushings shall be provided for the termination of all conduits not terminated in hubs, couplings or insulated throat connectors. Grounding type insulated bushings with insulating inserts in metal housings shall be provided for conduit 1-1/4 inches and larger. Standard bushings shall be galvanized steel or malleable iron in all sizes.
- I. Locknuts. One interior and one exterior locknut shall be provided for all conduit terminations not provided with threaded hubs and couplings. Locknuts shall be designed to securely bond with the conduit to the box when tightened. Locknuts shall be so constructed that they will not be loosened by vibration.
- J. Unions. Watertight conduit unions shall be Appleton or Crouse-Hinds Type UNF or UNY, or approved equal.
- K. Raintight conduit terminating hubs, where indicated on the drawings or required by these specifications, shall be Meyer's rigid conduit hubs, or approved equal.

2.3 CONDUIT BODIES

- A. Malleable iron conduit bodies shall be cast malleable iron with tensile strength meeting ASTM A 48, Class 30A requirements. Malleable conduit bodies shall be finished with an epoxy powder coating. Cover shall be malleable iron with captive screws.
- B. All conduit bodies' entrances shall be machined NPT threads with a smooth, rounded, internal conduit stop bushing.
- C. All conduit bodies shall be equipped with a sealed and gasketed cover. Cover shall be secured using stainless steel machine screws.

2.4 CONDUIT SUPPORTS

- A. Conduit supports shall be furnished and installed in accordance with other section of these specifications. Conduits shall be supported so that fittings are accessible. Support systems shall be limited to electrical conduits only.
- B. Hanger rods shall be 3/8-inch diameter galvanized threaded steel rods, minimum. Conduit racks over 18-inch wide, over one level, or supporting 2-inch RSC or larger, shall be 1/2-inch diameter rod minimum.
- C. Conduit Clamps. Conduits in single runs or groups of two shall be supported by steel clamps and clamp backs. They shall be galvanized malleable iron or approved equal cast ferrous metal for steel conduit or tubing.
- D. Support Channels. Supports for banks of three or more conduits shall be constructed of formed steel support channels (Unistrut, Kindorf, Superstrut, B-Line or approved equal) with associated conduit or tubing clips. Support channels shall be steel, hot-dip galvanized after fabrication with galvanized steel clips for steel conduit or tubing.
- E. Wall Penetrations. All conduits, raceways, cables and sleeve penetrations through fire rated and hazardous location walls, shafts, floor, ceilings, etc., shall be sealed with a UL-approved fire stopping system.

2.5 OUTLET BOXES AND SWITCH BOXES

- A. Manufacturers: Firms regularly engaged in the manufacturing of electrical raceways of the types and capacities required, whose products have been in satisfactory use in similar service for not less than 3 years.
- B. Sheet Metal Outlet Boxes: ANSI/NEMA OS 1, galvanized flat rolled sheet steel outlet wiring boxes of types, shapes and sizes, including box depths, to suit each respective location and

installation; construct with stamped knockouts in back and sides, and with threaded screw holes with corrosion-resistant screws for securing box covers and wiring devices.

- C. Outlet boxes used in wet outdoor locations, surface mounted shall be cast metal (FS or FD type) with mounting lugs and gasketed covers.
- D. Luminaire and Equipment Supporting Boxes: Rated for weight of equipment supported, per NEC requirements.
- E. Outlet Box Accessories: Provide outlet box accessories as required for each installation, including mounting brackets, wallboard hangers, extension rings, fixture studs, cable clamps and metal straps for supporting outlet boxes, which are compatible with outlet boxes being used and meeting requirements of individual wiring situations.

2.6 PULL BOXES, JUNCTION BOXES

- A. Sheet Metal Boxes shall be NEMA OS 1, NEMA rating as indicated on drawings. Minimum 16 gauge galvanized steel construction with stainless steel hinged cover and neoprene gasket. Cover shall be secured to the body with a continuous, full length, piano type hinge and stainless steel pin on one side and captive screw on the other side. Door shall be equipped with padlock hasp with sealing hole provisions.
 - 1. Provide #10-32 tapped hole provisions for optional ground lug kit.
 - 2. Provide 0.375-16 collar studs for mounting optional panel.
 - 3. Provide external mounting feet for secure wall mounting.
 - 4. Finish: Wash and phosphate undercoat with ANSI 61 gray polyester power finish.
- B. Surface-Mounted Cast Metal Box: NEMA 250, NEMA Type 3R or 4 as indicated, flat-flanged, surface-mounted junction box:
 - 1. Material: Cast Iron.
 - 2. Cover: Furnish with ground flange, neoprene gasket, and stainless steel cover screws.

2.7 CLOSURE FOAM

- A. All conduit, raceways, cables and sleeves penetrations through fire rated and hazardous location walls, shafts, floor, ceilings, etc., shall be sealed by closure foam as in Dow Corning #3-6548 silicone RTV, GE RTV 850 silicone foam, 3M, Hilti, or approved equal.

2.8 SEALING AND FIREPROOFING

- A. Penetrations. All conduits, raceways, cables and sleeve penetrations through fire rated and hazardous location walls, shafts, floor, ceilings, etc., shall be sealed with a UL-approved fire stopping system.
- B. Furnish UL listed products or products tested by a nationally recognized independent testing laboratory. Select products with rating not less than the rating of the wall, ceiling or floor being penetrated.
- C. Manufacturers:
 - 1. 3M CP 25WB + Caulk
 - 2. 3M FS 195 wrap or strip with restricting collar
 - 3. 3M CS 195 composite sheets
 - 4. Proset Systems fire rated floor and wall penetrations
 - 5. Dow Corning Fire Stop System
- D. Use stamped steel, chrome plated, hinged, split ring escutcheons or floor/ceiling plates for covering openings in occupied areas where conduit is exposed.

- E. In exterior wall openings below grade, use a modular mechanical type seal consisting of interlocking synthetic rubber links shaped to continuously fill the annular space between the conduit and the cored opening or a water-stop type wall sleeve.
- F. At non-rated interior wall or floor openings use Tremco Fyre-Sil, Sika Corp. Sikaflex Ia, Sonneborn Sonolastic NPT, or Mameco Vulkem 116 urethane caulk or Approved Equal.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify outlet locations and routing and termination locations of raceway prior to rough in.

3.2 EXISTING WORK

- A. Extend existing raceway and box installations using materials and methods compatible with existing electrical installations, or as specified.
- B. Clean and repair existing raceway and boxes to remain or to be reinstalled.

3.3 INSTALLATION OF RACEWAYS

A. Routing

1. Install raceway and boxes in accordance with NECA "Standard of Installation."
2. Conduit routing shown on drawings is diagrammatic only. Contractor shall field route conduit and raceways between equipment and devices as required to obtain a complete wiring system.
3. All exposed conduits shall be installed parallel or perpendicular to dominant surfaces with right-angle turns made of symmetrical bends or fittings.
4. Conduit shall not be installed on the outside face of exposed columns, but shall be routed on the web or on the inside of a flange of the column.
5. Except where prevented by the location of other work, a single conduit or a conduit group shall be centered on structural members.
6. Conduit shall be located at least 6 inches from hot water or steam pipes and from other hot surfaces

B. Moisture Pockets

1. Moisture pockets shall be eliminated from conduits. If water cannot drain to the natural opening in the conduit system, a hole shall be drilled in the bottom of a pull box or a "C-type" conduit fitting provided in the low point of the conduit run.

C. Couplings and Unions

1. Metal conduit shall be joined by threaded conduit couplings, with the conduit ends butted.
2. The use of running threads, Erickson type couplings, split couplings or similar unions are not permitted.

D. Conduit Bodies

1. Conduit bends shall meet the requirements of NEC, minimum bend radius of the cable installed or as indicated on the drawings, whichever is greater.
2. Conduits or tubing deformed or crushed in any way shall be removed from the job site.

E. Bends and Offsets

1. Changes in direction of conduits shall be made with fittings or bends.

2. Conduit bends shall meet the requirements of NEC, minimum bend radius of the cable installed or as indicated on the drawings, whichever is greater.
 3. Bends shall be made using appropriate tools or mechanical equipment. The use of a pipe tee or vise for bending conduit or tubing will not be permitted.
 4. For non-metallic conduit or plastic coated steel, approved factory bends and offsets shall be used.
 5. Conduits or tubing deformed or crushed in any way shall be removed from the job site.
 6. Install no more than the equivalent of three 90 degree bends between boxes or outlets
- F. Cutting and Threading
1. The plane of all conduit ends shall be square with the centerline.
 2. Where threads are required, they shall be cut and cleaned prior to conduit reaming.
 3. The ends of all conduit and tubing shall be reamed to remove all rough edges and burrs.
 4. Cutting oil shall be used in threading operations; the dies shall be kept sharp, and provisions shall be made for chip clearance.
 5. Threads on conduits and fittings shall be lubricated with conducting and sealing compound.
 6. All steel conduits shall be coated after threading with cold-galvanized zinc coating. The Contractor shall supply this protective material and shall apply it in the field prior to installing conduit or fittings.
- G. All steel conduit, exposed to weather or in contact with earth, shall be re-galvanized after threading with "Galvanizing Powder M-321" as manufactured by the American Solder and Flux Company of Philadelphia, Pennsylvania; "Zincilate 810" as manufactured by Industrial Metal Protectives, Inc., of Dayton, Ohio; "Zinc Rich" coating as manufactured by ZRC Chemical Products Company, Quincy, Massachusetts; or approved equal. The Contractor shall supply this protective material and shall apply it in the field.
- H. Connections to Boxes and Cabinets
1. Conduit shall be securely fastened to all boxes and cabinets.
 2. Threads on metallic conduit shall project through the wall of the box to allow the bushing to butt against the end of the conduit.
 3. The locknuts, both inside and outside, shall then be tightened sufficiently to bond the conduit securely to the box.
 4. Locknuts on connectors shall be tightened securely to bond the connectors.
- I. All conduits entering enclosures outdoors or in wet areas shall enter through Meyer's hubs, or approved equal, or threaded openings.
- J. Cleaning
1. Precautions shall be taken to prevent the accumulation of water, dirt, or concrete in the conduit.
 2. Conduit in which water or other foreign materials have been permitted to accumulate shall be thoroughly cleaned or, where such accumulation cannot be removed by methods acceptable to the Owner /Engineer, the conduit shall be replaced.
 3. For conduits sizes 3 inches and larger, draw a flexible testing mandrel approximately 12 inches long with a diameter less than the inside diameter of the conduit through the conduit. After which, draw a stiff bristle brush through until conduit is clear of particles of foreign materials. For conduits less than 3 inches, draw a stiff bristle brush through until conduit is clear of particles and foreign material.
- K. Empty Conduit
1. All conduits installed for future use shall have a polypropylene pull line with a minimum tensile strength of 200 lbs., Jet Line, Cat. No. 232, polyolefin, or approved equal. Pull line shall be secured at both ends to ensure future accessibility.

- L. Rooftop Conduits
1. Provide redwood sleepers on waterproof mastic base or pre-manufactured supports (i.e. caddy pyramid series) for all conduit runs exposed on roofs.
- M. Identification
1. All conduits shall be identified in accordance with other section of these specifications.
- N. Grounding
1. All conduits shall be grounded in accordance with specification Section 26 05 00 – Common Work Results for Electrical.
 2. A solid or stranded bare copper or green insulated copper solid or stranded ground wire shall be provided in all conduits and raceways.
- O. Galvanized Rigid Steel Conduit
1. Galvanized rigid steel conduit shall be installed in areas exposed to weather, vehicle traffic, in hazardous classified areas, for penetrations through foundations, and 10 feet before transition from below grade to 8 feet above grade, unless otherwise noted on the drawings.
 2. Steel conduit in contact with earth shall be protected by "Scotchwrap" 10 mil tape applied in double thickness using 50 percent lap turns to 6 inches above grade and 6 inches beyond transition.
 3. Expansion joints shall be used where required.
- P. Electrical Metallic Tubing
1. Electrical metallic tubing shall be installed for all circuits, indoors above concrete slab, where not subject to conditions outlined for rigid galvanized steel conduits.
- Q. Rigid Aluminum Conduit
1. Not acceptable on this project.
- R. Flexible Metal Conduit
1. Flexible conduit inserts not greater than 30 inches in length, shall be installed in all conduit runs, which are supported by both building steel and by structures subject to vibration or thermal expansion. This shall include locations where conduit supported by building steel enters or becomes supported by isolated structures on separate foundations.
 2. Flexible conduit shall be installed in conduit runs, which cross expansion joints.
 3. Special areas, such as plant office control rooms in which external noise is to be minimized, shall have flexible conduit in conduit runs where the runs cross from the main building framing to the control room or office framing.
 4. Flexible conduit shall be installed adjacent to all equipment and devices, which move in relation to the supply conduit due to vibration, normal operation of the mechanism, or thermal expansion.
 5. Conduit shall be connected to pressure switches, thermocouples, solenoids, and similar devices with flexible conduit. Flexible conduit shall be installed adjacent to the motor terminal housing for motors requiring 4-inch and smaller conduit.
 6. Flexible metal conduit inserts not greater than 6 feet in length shall be installed for light fixture tap conductors.
- S. Liquid-Tight Flexible Metal Conduit

1. Liquid-tight flexible metal conduit shall be used in place of regular flexible conduit for connections to motors and transformers, in areas exposed to weather, moisture or oil, and under raised floors.
2. Liquid-tight flexible metal conduit may be used in place of flexible metal conduit where not otherwise required.

T. Non-Metallic Conduit

1. Schedule 40 shall be used for all power, signal feeders and branch circuits, in earth or enclosed in concrete, unless otherwise noted on the drawings. Conduits must be buried in earth in accordance with the NEC.

U. Conduit Support

1. Fasten conduit supports to building structures and surfaces in accordance with these specifications.
2. Support raceway using coated steel or malleable iron straps, lay-in adjustable hangers, clevis hangers, and split hangers.
3. Do not use wire, ceiling support wires or perforated pipe straps to support conduit. Remove any temporary installation support wire.

V. Spacing of Supports

1. All conduit runs shall be rigidly supported, except where buried in concrete,.
2. Each conduit shall be supported within one (1) foot of junction boxes and fittings.
3. Spacers used in duct bank installations shall be placed no more than 6 to 10 feet apart.
4. Support spacing along conduit runs shall be as follows.

Conduit Size	Maximum Distance Between Supports
½ inch through 1-1/4 inch	5 feet
1-1/2 inch and larger	8 feet

- W. Ground and bond raceway and boxes in accordance with Section 26 05 00 – Common Work Results for Electrical.

3.4 CABINET AND BOX INSTALLATION

- A. Install electrical boxes as shown on drawings, and as required for splices, taps, wire pulling, equipment connections and compliance with regulatory requirements.
- B. Locate boxes and conduit bodies so as to ensure ready accessibility of electrical wiring, maintain headroom and to present neat mechanical appearance.
- C. Install pull boxes and junction boxes above accessible ceilings and in unfinished areas only. In inaccessible ceiling areas, install outlet and junction boxes no more than 6 inches from ceiling access panel or from removable recessed luminaire.
- D. Align adjacent wall mounted outlet boxes for switches, thermostats, and similar devices with each other.
- E. Use flush mounting outlet boxes in finished areas.
 1. Do not install flush mounting boxes back-to-back in walls.
 2. Provide minimum 6-inch separation between adjacent boxes.
 3. Provide minimum 24-inch separation in acoustic rated walls.
 4. Use stamped steel bridges to fasten flush mounting outlet box between studs.
 5. Secure flush mounting box to interior wall and partition studs.
 6. Accurately position to allow for surface finish thickness.
 7. Install flush mounting box without damaging wall insulation or reducing its effectiveness.

8. Use adjustable steel channel fasteners for hung ceiling outlet box.
- F. Support boxes independently of conduits.
 - G. Use code sized gang box where more than one device is mounted together. Do not use sectional box. Use code sized gang box with plaster ring for single device outlets.
 - H. Use cast outlet box in exterior locations where exposed to the weather and wet locations (interior or exterior).
 - I. Coordinate installation of electrical boxes and fittings with cable and raceway installation work. Provide knockout closures to cap unused knockout holes where blanks have been removed.
 - J. Do not use round boxes where conduit must enter box through side of box, which would result in difficult and insecure connections where fastened with a locknut or bushing on rounded surface.
 - K. Fasten boxes rigidly to substrate or structural surfaces to which they are being mounted, or solidly embed electrical boxes in concrete or masonry as appropriate.
 - L. Except as prevented by the location of other work, all junction boxes and outlet boxes shall be centered on structures.
 - M. Conduit openings in boxes shall be made with a hole saw or shall be punched.
 - N. Cabinets and boxes shall be rigidly mounted.
 1. Mounting on concrete shall be secured by self-drilling anchors.
 2. Mounting on steel shall be by drilled and tapped screw holes, or by special support channels welded to the steel, or by both.
 3. Cabinets shall be leveled and fastened to the mounting surface with not less than ¼-inch air space between the enclosure and mounting surface.
 4. All mounting holes in the enclosure shall be used.
 - O. Large Pull Boxes - Boxes larger than 100 cubic inches in volume or 12 inches in any dimension.
 1. Interior Dry Locations - Use hinged enclosure.
 2. Other Locations - Use surface mounted box of appropriate location classification.

3.5 ANCHORS

- A. Where supports for raceways, boxes, and cabinets are mounted on concrete surfaces, they shall be fastened with self-drilling tubular expansion shell anchors with externally split expansion shells, single-cone expanders, and annular break-off grooved chucking cones. Anchors shall be Phillips "Red Head" or approved equal.

3.6 SEALING AND FIREPROOFING

- A. Fire-Rated Surface:
 1. Where conduit penetrates fire rated surface, install fire-stopping product in accordance with manufacturer's published instructions.
 2. All openings through fire rated wall, floor, ceiling or roof must be sealed.
 3. Install galvanized sheet metal sleeves (minimum 12-gage) through opening and extending beyond minimum of one (1) inch on each side of building element.
 4. Pack void between sleeve and building element with backing material.
 5. Seal ends of sleeve with UL listed fire-resistive silicone compound to meet fire rating of structure penetrated.
- B. Non-Rated Surfaces:
 1. Opening through a non-fire rated wall, floor, ceiling or roof must be sealed using an approved type of material.
 2. Use galvanized sheet metal sleeves in hollow wall penetrations to provide a backing for the sealant. Grout area around sleeve in masonry construction.

3. Install escutcheons or floor/ceiling plates where raceway, penetrates non-fire rated surfaces in occupied spaces.
4. Install rubber links of mechanical seal tightened in place and sized for the pipe, in exterior wall openings below grade, in accordance with the manufacturer's instructions.
5. All pipe penetrations at interior partitions and/or walls, laboratory spaces, telephone, data and communication rooms and similar spaces where the room pressure or odor transmission must be controlled, shall be sealed. Sealant shall be applied to both sides of the penetration in such a manner that the annular space between the pipe sleeve and the pipe is completely filled.

3.7 ADJUSTING

- A. Install knockout closures in unused openings in boxes.

3.8 CLEANING

- A. Clean interior of boxes to remove dust, debris, and other material.
- B. Clean exposed surfaces and restore manufacturer's finish.

END OF SECTION

SECTION 26 05 53 - IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. The extent of the electrical systems and equipment requiring identification is shown on the drawings, and the extent of identification required is specified herein and in individual sections of work requiring identification. The types of electrical identification specified in this section include the following:
1. Exposed conduit color banding.
 2. Buried cable warnings.
 3. Cable/conductor identification.
 4. Operational instructions and warnings.
 5. Danger signs.
 6. Equipment/system identification signs.
- B. Unless otherwise noted, the Contractor shall provide all materials, equipment, and labor necessary to produce finished Work as shown on the Drawings and as specified herein.

1.2 REFERENCES - CODES AND STANDARDS

- A. ANSI Z535.4-1998 – Product Safety Signs and Labels
B. APWA ULCC – Uniform Color Code for Buried Utilities.
C. NFPA 70 – National Electrical Code (NEC). Latest approved edition.

1.3 SYSTEM DESCRIPTION

- A. Label the following electrical equipment with nameplates which clearly identify each item, the function or use of the item, and the circuit identification of the feed to the item:
1. All transformers shall be identified by 1-inch high block letters cut in stencil and applied with yellow paint on a flat-black background. The transformer number, primary and secondary voltages, and the kVA shall be shown.
 2. All Metal-Clad Switchgear, Metal-Enclosed Switchgear, Switchboards, Distribution Panelboards, Power and Lighting Panels, Motor Control Centers, Local Control Panels, Terminal Cabinets and all electrical equipment enclosure shall be identified using laminated plastic nameplates. The equipment number, voltage rating, current rating, number of phases, connection type, short circuit interrupting rating, and circuit number shall be shown
 3. Identify all receptacles and lighting switches, by the circuit number shown on the drawings using ¼-inch high white characters on ½-inch wide black stick-on tape placed on the wall directly above the device if the device is wall mounted. Place the tape on the device enclosure if the device is not wall mounted.
 4. All motors, starters, disconnect switches, Time Switches, Special Function Pushbuttons and Switches, and miscellaneous control devices shall be identified by function and circuit number, with ¼-inch high white characters on a ½-inch wide black stick-on tape where installed indoors and engraved plastic nameplates where installed outdoors.
 5. All underground raceway or cable shall be marked with buried warning tape along its entire length.
 6. All exposed raceway longer than 10 feet in length shall be identified.
 7. Panelboard Directories: Furnish all panelboards with a complete 8-1/2-inch by 11-inch typewritten directory mounted in the inner door under a clear plastic cover set in a metal frame.

B. Branch circuits and devices:

1. Label all individual receptacle outlets at the outlet faceplate to indicate the panelboard of origin and branch circuit number. Label modular furniture feeds at the power pole drop in a visible and consistent location. Labels shall be self-adhesive, thermal machine printed type such as Brothers, Panduit, or T&B and shall be clear plastic with black lettering.
2. All branch circuits in outlet boxes shall be identified with circuit number using wrap-around labels (T&B, BRADY or 3M).
3. As an alternative to separate nameplates, device plates may be engraved directly with lettering filled with black enamel.

1.4 SUBMITTALS

- A. Catalog data for nameplates, labels, and markers.
- B. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by Product testing agency specified under regulatory requirements. Include instructions for storage, handling, protection, examination, preparation and installation of Product.

1.5 REGULATORY REQUIREMENTS

- A. Conform to requirements of NFPA 70 – National Electrical Code.
- B. Furnish products listed and classified by Underwriters' Laboratories, Inc. (UL), Electrical Testing Laboratories, Inc. (ETL), or other recognized, approved testing and listing agencies as suitable for the purpose specified and shown.

PART 2 - PRODUCTS

2.1 NAMEPLATES AND LABELS

A. Nameplates

1. Engraved three-layer laminated plastic, white letters on black background for normal power and white letters on red background for emergency power. Communications and control cabinets shall be labeled with white letters on green background.
2. Locations
 - a. Each electrical distribution and control equipment enclosure.
 - b. Communication cabinets.
 - c. Motor control centers, including each combination module.
3. Letter Size
 - a. Use 1/8-inch letters for identifying individual equipment and loads.
 - b. Use 1/4-inch letters for identifying grouped equipment, loads, panelboards, and transfer switch.
 - c. Use 1/2-inch letters for identifying the main switchboard, motor control centers, and large distribution switchboards.

B. Labels

1. Embossed adhesive tape, with 3/16-inch white letters on colored background to match color scheme of plastic laminate labels in 2.1.1. Use only for identification of individual wall switches and receptacles, control device stations, and multi-outlet devices.
2. Thickness
 - a. 1/16-inch for units up to 20 square inches or 8-inch length; 1/8-inch for larger units.

2.2 WIRE MARKERS

- A. Manufacturers
 - 1. 3-M Co.
 - 2. Equal
- B. Description: Cloth, tape, split sleeve, or tubing type wire markers, self-adhesive.
- C. Locations: Each conductor at panelboard gutters, pull boxes, outlet and junction boxes, control panels, motor controllers and starters, and each load connection.
- D. Legend
 - 1. Power and Lighting Circuits: Branch circuit or feeder number indicated on contract drawings.
 - 2. Control Circuits: Control wire number indicated on shop drawings.
 - 3. Neutral Conductors: Clearly indicate the branch circuit or feeder number the neutral serves. In multi-wire circuits where the neutral is shared, mark the neutral with the circuit number of the "A" phase.

2.3 CONDUIT MARKERS

- A. Provide manufacturer's standard preprinted, flexible or semi-rigid, permanent, plastic-sheet conduit markers, minimum of 3 mils thick and 1-1/2-inch wide extending 360 degrees around conduits; designed for self-adhesive attachment to conduit. Except as otherwise indicated, provide lettering that indicates the voltage of the conductor(s) in the conduit. Provide 8-inch minimum length for 2-inch and smaller conduit, 12-inch minimum length for larger conduit.
- B. Identify conduits containing conductors above 600-volts with the following alternating markers
 - 1. DANGER - HIGH VOLTAGE
 - 2. The voltage, as applicable (i.e. – 12-kV, 4.16-kV, 480-Volts, 240-Volts, etc.)
- C. Location: Furnish markers for each conduit longer than 10 feet, spaced 20 feet on center.
- D. Color: Unless otherwise indicated or required by governing regulation, provide orange markers with black letters.
 - 1. Fire Alarm System: Red w/black letters.
 - 2. Telephone System: Green w/yellow letters.
 - 3. Data/Communication. System: White w/black letters.
 - 4. Emergency System: Orange w/black letters.
- E. Legend:
 - 1. 208 Volt System: Normal 208/120-volts.
 - 2. Fire Alarm System: Fire alarm.
 - 3. Telephone System: Telephone.
 - 4. Data/Communication System: Data/communications.

2.4 FASTENERS

- A. Secure all labels and nameplates with self-tapping stainless steel screws. Use contact type permanent adhesive where screws cannot or should not penetrate the substrate.

2.5 BAKED ENAMEL DANGER SIGNS

- A. Provide manufacturer's standard "DANGER" signs of baked enamel finish on 20 gage steel; of standard red, black and white graphics; 14-inch by 10-inch size except where 10-inch by 7-inch is the largest size which can be applied where needed, and except where larger size is needed for adequate vision; with recognized standard explanation wording (e.g. HIGH VOLTAGE, KEEP AWAY, BURIED CABLE, DO NOT TOUCH SWITCH).

1. At each entry doors of Electrical Rooms: "DANGER HIGH VOLTAGE – KEEP OUT, AUTHORIZED PERSONNEL ONLY"

2.6 LETTERING AND GRAPHICS

- A. Coordinate names, abbreviations and other designations used in the electrical identification work, with the corresponding designations shown, specified or scheduled. Provide numbers, lettering and wording as indicated or, if not otherwise indicated, as recommended by manufacturers or as required for proper identification and operation/maintenance of the electrical systems and equipment.

2.7 UNDERGROUND WARNING TAPE

- A. Three-inch minimum width, 5 mil thickness, foil bonded polyethylene tape, detectable type, with suitable continuous warning legend describing buried electrical lines. Tape color shall conform to APWA uniform color code using ANSI Z535.1 safety colors. Text shall be black, 2-inch minimum letters.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Degrease and clean surfaces to receive nameplates and labels.
- B. Coordination: Where identification is to be applied to surfaces that require finish, install identification after completion of painting.
- C. Regulations: Comply with governing regulations and the requests of governing authorities for the identification of electrical work.

3.2 APPLICATION

- A. Install nameplate and label parallel to equipment lines.
- B. Secure nameplate to equipment front using screws, rivets, or adhesive.
- C. Secure nameplate to outside moveable surface of door on panelboard.
- D. Conduit Identification:
 1. Where electrical conduit is exposed in spaces with exposed mechanical piping, which is identified by a color-coded method, apply color-coded identification on the electrical conduit in a manner similar to the piping identification. Except as otherwise indicated, use orange as the coded color for conduit.
 2. Paint red band or provide red tape on each fire alarm conduit longer than 10 feet, minimum 20 feet on center.
- E. Cable/Conductor Identification:
 1. Apply cable/conductor identification on each cable and conductor in each box/enclosure/cabinet where the wires of more than one circuit or communication/signal system are present, except where another form of identification (such as color-coded conductors) is provided.
 2. Match identification with marking system used in panelboards, shop drawings, contract documents, and similar previously established identification for project electrical work.
- F. Operational Identification and Warnings
 1. Wherever reasonably required to ensure safe and efficient operation and maintenance of the electrical systems, and electrically connected mechanical systems and general

systems and equipment, including the prevention of misuse of electrical facilities by unauthorized personnel, install self-adhesive plastic signs or similar equivalent identification, instruction or warnings on switches, outlets and other controls, devices and covers of electrical enclosures. Where detailed instructions or explanations are needed, provide plasticized tags with clearly written messages adequate for the intended purposes.

G. Danger Signs

1. In addition to the installation of danger signs required by governing regulations and authorities, install appropriate danger signs at the locations indicated and at locations subsequently identified by the Installer of electrical work as constituting similar dangers for persons in or about the project.
2. High Voltage
 - a. Install danger signs wherever it is possible, under any circumstances, for persons to come into contact with electrical power of voltages higher than 110-120 volts.
 - b. Critical Switches/Controls
 - c. Install danger signs on switches and similar controls, regardless of whether concealed or locked up, where untimely or inadvertent operation (by anyone) could result in significant danger to persons, or damage to or loss of property.

H. Electrical Hazard Warning

1. Provide field marking of switchboards, switchgear, panelboards, control panels, meter socket enclosures, and motor control centers to warn of potential electric arc flash hazards in accordance with NEC 110.16 and NFPA 70E-2012.
 - a. Marking shall be in accordance with ANSI Z535.4-1998 with regards to design of safety labels and application to products.

I. Equipment/System Identification Signs

1. Install an engraved plastic-laminate sign on each major unit of electrical equipment in the building; including the central or master unit of each electrical system and the communication/signal systems, unless the unit is specified with its own self-explanatory identification or signal system.
2. Except as otherwise indicated or specified, provide single line of text, 1/2-inch high lettering on 1-1/2-inch high sign (2-inch high where two lines are required), white lettering in black field.
3. Provide text matching terminology and numbering of the contract documents and shop drawings.
4. Provide signs for each unit of the following categories of electrical work
 - a. Major electrical switchboard
 - b. Electrical substation
 - c. Motor control center
 - d. Fire alarm control panel and annunciators.

J. Install signs at locations indicated or, where not otherwise indicated, at location for best convenience of viewing without interference with operation and maintenance of equipment. Secure to substrata with fasteners, except use adhesive where fasteners should not or cannot penetrate the substrata.

K. Identify underground conduits using underground warning tape. Install one tape per trench at 3 inches below finished grade.

END OF SECTION

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SECTION 26 24 16 - PANELBOARDS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Lighting and appliance branch-circuit panelboards.
- B. Unless otherwise noted, the Contractor shall provide all materials, equipment, and labor necessary to produce finished Work as shown on the Drawings and as specified herein.

1.2 SUBMITTALS

- A. Product Data: For each type of panelboard, switching and overcurrent protective device, transient voltage suppression device, accessory, and component indicated. Include dimensions and manufacturers' technical data on features, performance, electrical characteristics, ratings, and finishes.
- B. Shop Drawings: For each panelboard and related equipment.
 - 1. Include dimensioned plans, elevations, sections, and details. Show tabulations of installed devices, equipment features, and ratings.
 - 2. Detail enclosure types and details for types other than NEMA 250, Type 1.
 - 3. Detail bus configuration, current, and voltage ratings.
 - 4. Short-circuit current rating of panelboards and overcurrent protective devices.
 - 5. Include evidence of NRTL listing for series rating of installed devices.
 - 6. Detail features, characteristics, ratings, and factory settings of individual overcurrent protective devices and auxiliary components.

1.3 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For panelboards and components to include in emergency, operation, and maintenance manuals. In addition to items specified in Section 017823 - Operation and Maintenance Data, include the following:
 - 1. Manufacturer's written instructions for testing and adjusting overcurrent protective devices.
 - 2. Time-current curves, including selectable ranges for each type of overcurrent protective device that allows adjustments.

1.4 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Keys: Two spares for each type of panelboard cabinet lock.

1.5 QUALITY ASSURANCE

- A. Source Limitations: Obtain panelboards, overcurrent protective devices, components, and accessories from single source from single manufacturer.
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- C. Comply with NEMA PB 1.
- D. Comply with NFPA 70.

1.6 PROJECT CONDITIONS

- A. Environmental Limitations:
 - 1. Do not deliver or install panelboards until spaces are enclosed and weathertight, wet work in spaces is complete and dry, work above panelboards is complete, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.
- B. Interruption of Existing Electric Service: Do not interrupt electric service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary electric service according to requirements indicated:
 - 1. Notify Owner no fewer than five days in advance of proposed interruption of electric service.
 - 2. Do not proceed with interruption of electric service without Owner's written permission.
 - 3. Comply with NFPA 70E.

1.7 COORDINATION

- A. Coordinate layout and installation of panelboards and components with other construction that penetrates walls or is supported by them, including electrical and other types of equipment, raceways, piping, encumbrances to workspace clearance requirements, and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.

PART 2 - PRODUCTS

2.1 DISTRIBUTION AND BRANCH CIRCUIT PANELBOARDS

- A. Manufacturers:
 - 1. Square D Co.
 - 2. Or Approved Equal.
- B. Product Description
 - 1. NEMA PB 1, circuit breaker type distribution, lighting and appliance branch circuit panelboard.
- C. Service Conditions:
 - 1. Temperature: 104 degrees F (40 degrees C) ambient
 - 2. Altitude: 100 feet (35 m) above sea level.
- D. Panelboard Bus
 - 1. Silver plated copper current carrying components, ratings as indicated on drawings.
 - 2. Main bus ampacity shall be equal to the main circuit breaker frame size rating.
 - 3. Furnish copper ground bus in each panelboard.
- E. Minimum integrated short circuit rating
 - 1. Panelboards rated 240-Volts - 10,000 amperes RMS symmetrical
 - 2. Panelboards rated 480-Volts - 42,000 amperes RMS symmetrical
 - 3. Circuit Breaker rating shall match or exceed the panel interrupting rating
 - 4. Series rated circuit breakers are not acceptable
- F. Enclosure:

1. **Indoor** Installation:

- a. NEMA PB 1, Type 1, gasketed, steel construction, minimum 6 inches deep, 20 inches wide suitable for flush or surface mounting as indicated on drawings.
- b. Flush or surface cabinet front with concealed trim clamps, concealed hinge, metal directory frame, and flush lock keyed alike. Finish in manufacturer's standard gray enamel.
- c. Fully hinged door with flush lock and metal directory frame.
- d. Finished in manufacturer's standard gray enamel (ANSI 61).

2.2 BRANCH CIRCUIT POWER METERING

- A. Each panelboard shall include a sensors for metering at the branch circuit level and provisions for a metering display which can be used to review the current status, view any branch current/power level/consumption, and view overall power consumption.
- B. Each panel shall be installed with a Cat-6A cable run from the internal metering equipment through a confined chase within the panel (to separate the low-voltage cabling from the line voltage conductors) to an external location where the cable is to be coiled (min 15' spare cable) for connection to the Campus network.
- C. The metering device shall be UL, cUL listed, and CE marked. The device will also meet ANSI standard C12.1-2001 energy revenue metering accuracy and IEC 61036 Class 1 accuracy.
- D. The metering device shall provide direct reading metered or calculated values for up to forty-two (42) branch circuits with auxiliary inputs available for one (1) three-phase main device and one (1) neutral.
- E. Monitored values for the main device to include:
 1. Current per phase
 2. Max current per phase
 3. Current demand per phase
 4. Max current demand per phase
 5. Energy (kWh) per phase
 6. Real power (kW) per phase
 7. Power Factor Total based on three-phase breaker rotation
 8. Power factor per phase
 9. Voltage Line-to-Line and average
 10. Voltage Line-to-Neutral and average
 11. Phase A frequency
- F. Monitored Values at the branch circuit level to include:
 1. Current
 2. Max current
 3. Current demand
 4. Max current demand
 5. Real power (kW)
 6. Real power (kW) demand
 7. Real power (kW) demand max
- G. Each panel shall include two (2) solid-core strips with tombstone type current transformers for 42-circuits. The strips shall be connected to the main circuit board of the meter via a standard ribbon cable connection.
 1. The current transformers mounted on the circuit board based strips must be spaced to align with the panelboard branch circuit breakers.

2.3 MOLDED CASE CIRCUIT BREAKERS

- A. NEMA AB 1, bolt-on type thermal magnetic and instantaneous magnetic trip circuit breaker. Circuit breaker thermal elements shall be of the bimetallic type and shall be capable of withstanding sustained overload and short-circuit currents without injury and without affecting the calibration of the bimetallic element. The thermal element shall have inverse time characteristics. The instantaneous elements shall trip the circuit breaker at the minimum standard trip setting.
- B. Provide common trip handle for multiple pole circuit breakers.
- C. Provide type SWD for lighting circuits and type HACR circuit breakers for air conditioning equipment circuits.
- D. Provide Class A ground fault interrupter circuit breakers as indicated on drawings.
- E. Trip rating shall be as indicated on drawings.
- F. Minimum integrated short circuit rating
 - 1. Circuit Breakers rated 240-Volts - 10,000 amperes RMS symmetrical
 - 2. Circuit Breakers rated 480-Volts - 42,000 amperes RMS symmetrical
 - 3. Circuit Breaker rating shall match or exceed the panel interrupting rating
 - 4. Series rated breakers are not acceptable

2.4 METERING

- A. Metering shall have the following functions
 - 1. Power: Instantaneous demand (kW)
 - 2. Power: Historical peak demand (kW)
 - 3. Energy: Cumulative, resettable (kWh)

2.5 SURGE PROTECTION DEVICE:

- A. IEEE C62.41-compliant, integrally mounted bolt-on, solid-state, parallel-connected, modular with field-replaceable modules type, with sine-wave tracking suppression and filtering modules, short-circuit current rating complying with UL 1449, second edition, and matching or exceeding the panelboard short-circuit rating, redundant suppression circuits, with individually fused metal-oxide varistors.
 - 1. Accessories:
 - a. Fuses rated at 200-kA interrupting capacity.
 - b. Fabrication using bolted compression lugs for internal wiring.
 - c. Integral disconnect switch.
 - d. Arrangement with wire connections to phase buses, neutral bus, and ground bus.
 - e. LED indicator lights for power and protection status.
 - f. Six-digit, transient-event counter set to totalize transient surges.
 - 2. Peak Single-Impulse Surge Current Rating: 120 kA per mode/240 kA per phase.
 - 3. Minimum single-impulse current ratings, using 8-by-20-mic.sec. waveform described in IEEE C62.41.2.
 - a. Line to Neutral: 70,000 A.
 - b. Line to Ground: 70,000 A.
 - c. Neutral to Ground: 50,000 A.
 - 4. Withstand Capabilities: 12,000 IEEE C62.41, Category C3 (10 kA), 8-by-20-mic.sec. surges with less than 5 percent change in clamping voltage.
 - 5. Protection modes and UL 1449 SVR for grounded wye circuits with 480Y/277; 208Y/120-V, three-phase, four-wire circuits shall be as follows:
 - a. Line to Neutral: 800 V for 480Y/277; 400 V for 208Y/120.

- b. Line to Ground: 800 V for 480Y/277; 400 V for 208Y/120.
- c. Neutral to Ground: 800 V for 480Y/277; 400 V for 208Y/120.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine panelboards before installation. Reject panelboards that are damaged or rusted or have been subjected to water saturation.
- B. Examine elements and surfaces to receive panelboards for compliance with installation tolerances and other conditions affecting performance of the Work.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install panelboards and accessories according to NEMA PB 1.1.
- B. Temporary Lifting Provisions: Remove temporary lifting eyes, channels, and brackets and temporary blocking of moving parts from panelboards.
- C. Mount panelboard cabinet plumb and rigid without distortion of box.
- D. Install overcurrent protective devices and controllers not already factory installed.
- E. Install filler plates in unused spaces.
- F. Comply with NECA 1.

3.3 IDENTIFICATION

- A. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs complying with Section 26 05 53.
- B. Panelboard Nameplates: Label each panelboard with a nameplate complying with requirements for identification specified in Section 26 05 53.

3.4 ADJUSTING

- A. Adjust moving parts and operable component to function smoothly, and lubricate as recommended by manufacturer.

END OF SECTION

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SECTION 26 27 26 - WIRING DEVICES

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Wiring devices are defined as single discrete units of electrical distribution systems that are intended to carry but not utilize electric energy. The types of general-purpose wiring devices required for the project include, but are not limited to the following line voltage devices:
 - 1. Connectors
 - 2. Plugs
 - 3. Receptacles
 - 4. Switches
 - 5. Wall plates
- B. Unless otherwise noted, the Contractor shall provide all materials, equipment, and labor necessary to produce finished Work as shown on the Drawings and as specified herein.

1.2 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

- A. IEC 529 - Degrees of Protection provided by Enclosures.
- B. NEMA WD 1 - General Purpose Wiring Devices
- C. NEMA WD 6 - Wiring Device Configurations.

1.3 SUBMITTALS

- A. Product Data:
 - 1. Catalog cut of each device showing Manufacturer name, catalog number, voltage and current rating and dimensions.

1.4 REGULATORY REQUIREMENTS

- A. Furnish products listed and classified by UL, ETL, or other recognized, acceptable testing and listing agencies as suitable for the purpose specified and shown.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Provide factory fabricated wiring devices in the type, color, electrical rating for service indicated, and/or as shown on the drawings.

2.2 MANUFACTURERS

- A. Provide products produced by one of the following for each type of wiring device:
 - 1. Appleton
 - 2. Arrow-Hart, Inc.
 - 3. Bryant Electric Co.
 - 4. Crouse-Hinds Co.
 - 5. General Electric Co.
 - 6. Hubbell Wiring Device Division

7. Pass & Seymour
8. Pyle National
9. Wiremold (multi-outlet assemblies)
10. Or Approved Equal

2.3 WALL SWITCHES

- A. Provide specification grade, quiet type, flush, 1-pole, 2-pole, three and four-way toggle switches, 20 ampere, 120/277-volts AC, with mounting yoke insulated from mechanism equipped with plaster ears and side wired screw terminals, white plastic body with Decora rocker style action.
1. Device Number: #5621-2W, #5622-2W, #5623-2W, #5624-2W
 2. Manufacturers: Leviton (or equal by Hubbell, Pass & Seymour, Cooper)

2.4 RECEPTACLES

- A. Provide specification grade, grounding type, heavy-duty, Decora receptacles with white plastic body, green hexagonal equipment ground screw terminal and grounding poles internally connected to mounting yoke; metal plaster ears; side wiring as follows:
1. Duplex Receptacle: Two pole, 3 wire, 20-ampere, 125-volt duplex receptacle, NEMA configuration 5-20R unless otherwise indicated. Leviton #5362-W (or equal by Hubbell, Pass & Seymour, Cooper).
 2. GFCI Receptacle: Two pole, 3 wire, 20-ampere, 125-volt duplex receptacle with integral ground fault circuit interrupter to meet regulatory requirements. Leviton #T7899-W (or equal by Hubbell, Pass & Seymour, Cooper)
 3. Special Purpose: Two pole, 3 wire, 20-ampere, 125-volt single receptacle, twist-lock, NEMA configuration L5-20R as indicated.
 4. Special Purpose Receptacle: Type as required meeting the requirements of this Section and the equipment shown on the drawings and elsewhere specified.

2.5 PLUGS AND CONNECTORS

- A. Comply with NEMA Standards Publication No. WD-1. Provide 20 ampere, 125-volts, Bakelite body connectors, 3-wire grounding, parallel blades, double wipe contact, with cord clamp.
- B. Matching Insulgrip, corrosion resistant nylon plugs, IP20, shall be provided for each twist-lock type receptacles unless indicated otherwise.
- C. Manufacturers: Hubbell, Pass & Seymour, Bryant, or Approved Equal.

2.6 WALL PLATES

- A. Decorative Cover Plate: High impact, smooth nylon and smooth satin in finished areas. Color of nylon cover plate shall be ivory unless noted otherwise. Stainless steel cover plate in unfinished areas or where device is embedded in concrete.
- B. For areas where two separate power sources are provided, each power source receptacle shall have a different color cover plate such as black, gray, or brown. Emergency power source receptacles shall have a red cover plate.
- C. Weatherproof Cover Plate: Gasketed cast metal with hinged gasketed device cover. Cover for duplex devices shall be designed such that each device is independently covered.

2.7 MULTI-OUTLET ASSEMBLIES

- A. Provide fixed multi-outlet assemblies consisting of #5362 grounding type, 20 ampere, 125-volt, two poles, three wire receptacles as an integral part, on 12-inch centers, unless otherwise noted.

- B. Where more than one circuit is indicated, do not connect adjacent receptacles to the same circuit. Include raceway snap-on covers with punched holes to accurately align receptacles.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify outlet boxes are installed at proper height.
- B. Verify wall openings are neatly cut and will be completely covered by wall plates.
- C. Verify branch circuit wiring installation is completed, tested, and ready for connection to wiring devices.
- D. Inspect each item of materials or equipment immediately prior to installation, and reject damaged and defective items.

3.2 PREPARATION

- A. Provide extension rings to bring outlet boxes flush with finished surface, if necessary.
- B. Clean debris from all boxes.

3.3 INSTALLATION

- A. Install wiring devices where indicated, in accordance with the manufacturer's written instructions, the applicable requirements of the NEC and the NECA "Standard of Installation", and in accordance with recognized industry practices to ensure that products serve the intended function.
- B. Comply with the manufacturer's applicable instructions and recommendations for installation, to whatever extent these are more explicit or more stringent than applicable requirements indicated in the contract documents.
 - 1. Install devices plumb and level. Install switches with OFF position down
 - 2. Install vertically oriented grounded receptacles with grounding pole on top
 - 3. Connect wiring device grounding terminal to equipment grounding conductor.
 - 4. Connect isolated ground (IG) receptacle equipment (yoke) grounding terminal only at metallic box with bonding jumper
 - 5. Install decorative plates on switch, receptacle, and blank outlets in finished areas
 - 6. Install galvanized steel plates on outlet boxes and junction boxes in unfinished areas, above accessible ceilings, and on surface mounted outlets in utility areas. (Does not include multi-outlet assemblies, other similar locations.).
 - 7. Identify wiring devices as specified in Section 26 27 26.

3.4 INTERFACE WITH OTHER PRODUCTS

- A. Coordinate locations of outlet boxes to obtain mounting heights compliant with ADA. See drawings for specific mounting heights

3.5 FIELD QUALITY CONTROL

- A. Inspect each wiring device for defects.
- B. Operate each wall switch with circuit energized and verify proper operation.
- C. Verify that each receptacle device is energized.
- D. Test each receptacle device for proper polarity.
- E. Test each GFCI receptacle device for proper operation.
- F. Verify that each telephone and data jack is properly connected and circuit is operational.

3.6 ADJUSTING

- A. Adjust devices and wall plates to be flush, plumb and level.

END OF SECTION

DIVISION 31

EARTHWORK

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SECTION 31 05 13 – SOILS FOR EARTHWORK

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Subsoil materials.
 - 2. Topsoil materials.

- B. Related Sections:
 - 1. Section 31 23 17 - Trenching.
 - 2. Section 31 23 23 - Fill.
 - 3. Section 32 92 19 - Seeding.
 - 4. Section 33 46 00 - Subdrainage: Filter aggregate.

1.2 REFERENCES:

- A. American Association of State Highway and Transportation Officials:
 - 1. AASHTO T180 - Standard Specification for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in.) Drop.

- B. ASTM International:
 - 1. ASTM C136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 - 2. ASTM D698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m^{3 - 3. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN-m/m^{3 - 4. ASTM D2487 - Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System).}}

1.3 SUBMITTALS

- A. Submit test data for controlled fill and select fill.
- B. Samples: Samples for each door face material in specified finish.

1.4 QUALITY ASSURANCE

- A. Furnish each subsoil and topsoil material from single source throughout the Work.
- B. Perform Work in accordance with Caltrans Standard Plans.

PART 2 - PRODUCTS

2.1 SUBSOIL MATERIALS

- A. Select Fill:
 - 1. On-site excavated and re-used material or Imported graded limestone or coral sand and gravel.
 - 2. Free of lumps and rocks larger than 4 inches, and debris.
 - 3. A maximum of 25% fines passing the No. 200 mesh sieve.

4. Conforming to ASTM D2487 Group Symbol GM or GC.
5. Contractor may use crushed concrete passing a 1" screen.

2.2 TOPSOIL MATERIALS

- A. Topsoil:
 1. Topsoil material scraped from excavation areas and passing a 1" screen with characteristics similar to other materials listed in this section.
 2. Sandy loam.
 3. Reasonably free of roots, rocks larger than 1 inch, subsoil, debris, large weeds, and foreign matter.
 4. Acidity range (pH) of 5.5 to 7.5.
 5. Containing minimum of 4 percent and maximum of 25 percent inorganic matter.

2.3 SOURCE QUALITY CONTROL

- A. Quality Requirements: Testing and Inspection Services for Testing and analysis of soil material.
- B. Testing and Analysis of Subsoil Material: Perform in accordance with ASTM D698. ASTM C136.
- C. When tests indicate materials do not meet specified requirements, change material and retest.
- D. Furnish materials of each type from same source throughout the Work.
- E. Testing frequency shall be one test for every 500 cubic yards of each type of imported soil.

PART 3 - EXECUTION

3.1 EXCAVATION

- A. Excavate subsoil from areas designated as called for in Section 31 23 16. Strip topsoil to full depth of topsoil in designated areas.
- B. Stockpile excavated material meeting requirements for subsoil materials.
- C. Remove excess excavated materials not intended for reuse, from site.
- D. Remove excavated materials not meeting requirements for subsoil materials from site.

3.2 STOCKPILE

- A. Stockpile excavated material meeting requirements for subsoil materials.
- B. Stockpile in sufficient quantities to meet Project schedule and requirements.
- C. Separate differing materials with dividers or stockpile apart to prevent mixing.
- D. Direct surface water away from stockpile site to prevent erosion or deterioration of materials.

3.3 STOCKPILE CLEANUP

- A. Remove stockpile, leave area in clean and neat condition. Grade site surface to prevent free standing surface water.

END OF SECTION

SECTION 31 05 16 – AGGREGATES FOR EARTHWORK

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Coarse aggregate materials.
2. Fine aggregate materials.
3. Aggregate drain rock.

B. Related Sections:

1. Section 31 05 13 - Soils for Earthwork: Fill and grading materials.
2. Section 31 23 17 - Trenching.
3. Section 31 23 23 - Fill.
4. Section 31 37 00 - Riprap.
5. Section 32 11 23 - Aggregate Base Courses.
6. Section 33 11 16 - Site Water Utility Distribution Piping.
7. Section 33 46 00 - Subdrainage: Filter aggregate.

1.2 REFERENCES

A. American Association of State Highway and Transportation Officials:

1. AASHTO M147 - Standard Specification for Materials for Aggregate and Soil-Aggregate Subbase, Base and Surface Courses.
2. AASHTO T180 - Standard Specification for Moisture-Density Relations of Soils Using a 10-lb Rammer and a 18-in. Drop.
3. AASHTO T210 – Standard Method of Test for Aggregate Durability Index.

B. ASTM International:

1. ASTM C136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
2. ASTM D698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³).
3. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³).
4. ASTM D2487 - Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System).
5. ASTM D4318 - Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

1.3 SUBMITTALS

- A. Submit name of imported fill material suppliers and Test Data.

1.4 QUALITY ASSURANCE

- A. Furnish each aggregate material from single source throughout the Work.
- B. Perform Work in accordance with Caltrans Standard Plans.

PART 2 - PRODUCTS

2.1 COARSE AGGREGATE MATERIALS

- A. Class 2 Aggregate Base per Caltrans Standard Specifications 26-1.02B.
- B. Coarse Aggregate Subbase: Crushed Gravel: Angular crushed; free of shale, clay, friable material and debris; Los Angeles abrasion 50% max; Durability index, AASHTO T210 of 35 minimum; Liquid limit 25% max; graded within the following limits:

Sieve Size	Percent Passing
2 ½ inches	100 (1)
2 inches	97-100 (1)
1 inch	65-79 (6)
1/2 inch	45-59 (7)
No. 4	28-42 (6)
No. 40	9-17 (4)
No. 200	4-8 (3)

() The value in the parentheses is the allowable deviation (±) from the target values.

- C. Coarse Aggregate Base: Crushed Gravel: Angular crushed; free of shale, clay, friable material and debris; Los Angeles abrasion 50% max; Durability index, AASHTO T210 of 35 minimum; Liquid limit 25% max; graded within the following limits:

Sieve Size	Percent Passing
2 inches	100 (1)
1 inch	80-100 (6)
3/4 inch	64-94 (6)
3/8 inch	40-69 (6)
No. 4	31-54 (6)
No. 200	4-7 (3)

() The value in the parentheses is the allowable deviation (±) from the target values.

- D. Class 2 Aggregate Base per Caltrans Standard Specifications 26-1.02B.
- E. Aggregate Drain Rock: Natural stone; washed, free of clay, shale, organic matter; to the following limits:
 1. Minimum Size: 1/4 inch.
 2. Maximum Size: 1 1/2 inch.

2.2 FINE AGGREGATE MATERIALS

- A. Fine Aggregate (Sand): Natural or bank sand; washed; free of silt, clay, loam, friable or soluble materials, and organic matter; graded in accordance within the following limits:

Sieve Size	Percent Passing
3/8 inch	100

No. 4	50
No. 14	6
No. 50	2
No. 200	1

2.3 SOURCE QUALITY CONTROL

- A. Section 01 40 00 - Quality Requirements: Testing and inspection services.
- B. Coarse Aggregate Material - Testing and Analysis: Perform in accordance with ASTM D698. ASTM D4318. ASTM C136.
- C. Fine Aggregate Material - Testing and Analysis: Perform in accordance with ASTM D698. ASTM D4318. ASTM C136.
- D. When tests indicate materials do not meet specified requirements, change material and retest.

PART 3 - EXECUTION

3.1 EXCAVATION

- A. Excavate aggregate materials from on-site locations indicated.
- B. Stockpile excavated material meeting requirements for coarse aggregate materials.
- C. Remove excess excavated materials not intended for reuse from site.
- D. Remove excavated materials not meeting requirements for coarse aggregate materials from site.

3.2 STOCKPILING

- A. Stockpile materials on site at locations designated by Engineer.
- B. Stockpile in sufficient quantities to meet Project schedule and requirements.
- C. Separate different aggregate materials with dividers or stockpile individually to prevent mixing.
- D. Direct surface water away from stockpile site to prevent erosion or deterioration of materials.

3.3 STOCKPILE CLEANUP

- A. Remove stockpile, leave area in clean and neat condition. Grade site surface to prevent free standing surface water.

END OF SECTION

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SECTION 31 22 16 - FIELD AND TRACK SUBGRADE ESTABLISHMENT

PART 1 - GENERAL

1.1 SCOPE OF WORK

- A. Furnish all labor, material and equipment for the earthwork and the subgrade establishment for the synthetic turf field and rubberized track and field event surfaces. Work includes, but is not limited to the following:
 - 1. Layout and engineering;
 - 2. Surface water and erosion control;
 - 3. Management of the construction sequencing and scheduling relative to soil moisture content and the use of onsite material as fill;
 - 4. Excavation, filling, back filling and compacting;
 - 5. Subgrade scarification, drying, and re-compaction as required;
 - 6. Compaction, compaction testing, and establishment of subgrade;

1.2 EXISTING SITE CONDITIONS

- A. Refer to drawings for topographical and existing condition information and the geotechnical report for site soil conditions.
- B. Carefully maintain benchmarks, monuments and other reference points. If disturbed or destroyed, replace as directed. It is the responsibility of the Contractor to familiarize themselves with all records of existing utilities in area of site work.
- C. The Contractor shall contact the appropriate utility agencies for identification of underground utility location.

1.3 TEMPORARY EROSION AND SILTATION CONTROL

- A. All work shall conform to the erosion and sedimentation control requirements of the local jurisdiction including installation of siltation control such as filter fabric fences, check dams, sedimentation basins, etc. and approved SWPPP plan.

1.4 EXISTING UTILITIES

- A. The Contractor shall coordinate all existing utilities prior to proceeding with demolition and earthwork activity. Protect any active pipes encountered.

1.5 DUST CONTROL

- A. Protect persons and property from damage and discomfort caused by dust. Water as necessary to quell dust.

1.6 ROADWAY PROTECTION

- A. Provide wheel-cleaning stations to clean wheels and undercarriage of trucks before leaving site, as necessary to prevent dirt from being carried onto public streets. If streets are fouled, they must be cleaned immediately in conformance with the requirements of the local jurisdiction as applicable. This requirement applies to all vehicle movements for the entire period of construction.

1.7 TRAFFIC REGULATION

- A. Conduct operations in such a manner to avoid unnecessary interference to existing traffic. Minimize heavy vehicle traffic to and from site during peak traffic hours. Do not park vehicles in

traffic lanes. Provide flagmen as required. Conform to traffic control requirements of the local jurisdiction.

- B. Contractor shall be responsible for all traffic control and emergency call outs resulting from Contractor operations.
- C. Maintain fire lanes, roadways and alleys to existing buildings continuously, as required by the fire department having jurisdiction.
- D. Existing walkways and roadways leading past the construction shall remain clear and safe at all times. Provide barriers, flashing lights, walkways, guardrails and night lighting as required for safety and control.

1.8 RELATED WORK IN OTHER SECTIONS

- A. 02 10 00 Site Preparation

1.9 QUALIFICATIONS

- A. The Contractor or subcontractor responsible for field and track base establishment, field subsurface drainage, field washwater and irrigation systems, and field permeable aggregate placement and compaction shall be submitted to the Field Landscape Architect for approval. Specific prequalification requirements are included as follows:
 - 1. Contractor or sub-contractor shall be and has been actively and directly engaged in constructing similar natural or synthetic field projects for a period of five (5) or more years and shall provide proof of four (4) or more sports field base installations completed in the past two (2) years. as used in this section means a project similar in character to the work in which each respective firm or their employee will perform on this project. The "similar project" shall also be equal or greater in scale and complexity than the work for which each firm will be engaged to perform on this project. The "similar" project must be a natural or synthetic turf athletic field and/or a rubberized running track project, consisting of at least 75,000 sf of field surface area and a 400m, 8 lane running track. The Contractor's experience shall include completion of high school, college, or professional level competition fields. The playing field system shall include earthwork, washwater or irrigation systems, drainage and subsurface drainage systems, and base aggregate placement and compaction. Provide a listing of all construction contracts (whether completed or in progress) entered into or performed by the Contractor or subcontractor within the past five years for projects similar in scope, time and complexity to the work called for under this Contract; include the names of the contracts, and the names and contact information of the owners.

PART 2 - PRODUCTS

Not Applicable

PART 3 - EXECUTION

3.1 FIELD LAYOUT AND ENGINEERING

- A. The General Contractor shall be responsible for the vertical and horizontal layout of all work and control points required to construct all work in accordance with the drawings and specifications.

3.2 SEQUENCING AND SCHEDULING

- A. All new cut and fill areas shall be seal rolled at the end of each day to minimize moisture penetration.

3.3 EXCAVATED MATERIALS

- A. Strip surface to be disturbed of existing grass, brush, and any other organic plant material and dispose of off-site.
- B. All excess soil materials excavated to establish the required subgrade elevations shall be removed and disposed of off-site.
- C. All items of concrete, debris, piping, etc., are to be disposed of off-site at Contractor's expense and pre-arranged location. The Contractor shall make efforts to have the concrete and asphalt concrete paving recycled.

3.4 SUBGRADE

- A. All synthetic turf areas are to be compacted to at least 92% of maximum dry density by mechanical means as determined by ASTM D 1557-02. The Contractor shall be responsible for maintaining appropriate soil moisture prior to and during compaction activities, the cost of which is to be included in the contract price.
- B. All rubberized track areas, including concrete paving at perimeter and asphalt paving directly below the rubberized surfacing shall be compacted to at least 95% of maximum dry density by mechanical means as determined by ASTM D 1557-02. The Contractor shall be responsible for maintaining at or above optimum soil moisture prior to and during compaction activities, the cost of which is to be included in the contract price.
- C. Care must be exercised during grading of the subgrade so as to achieve a uniform, true surface relative to finish grade.
- D. Finish subgrade for the field and track areas shall be established to within the tolerance of +0.00' or - 0.10' of the design subgrade elevation for these areas.
- E. Fill must be select material, found on site below the existing field and free of organic matter, clay, concrete and other extraneous material, compactable to a minimum of 95% of the maximum dry density. Fill shall be placed and compacted in lifts of 12" maximum loose depth.
- F. Upon completion of the subgrade establishment and Contractor confirmation for conformance with the tolerance, the Contractor shall notify the Field Landscape Architect and schedule an inspection for approval. The Contractor shall have a laser plane system with slope control available to the Field Landscape Architect for the inspections. The Contractor shall not be authorized to install the subsurface drainage system until the subgrade has been inspected and approved by the Field Landscape Architect.
- G. All other areas shall be compacted to a maximum of 90% of the maximum dry density. These areas shall be established to within the tolerance of +0.10' or - 0.10' of the design elevations and grades. All perimeter and swale areas shall be sloped in accordance with the grading plan. Swale grades shall include a constant slope between the designated high point and any catch basin rim elevations. Areas of ponding water in the swales shall not be accepted.

END OF SECTION 31 22 16
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SECTION 31 23 16 - EXCAVATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Soil densification.
 - 2. Excavating for building foundations.
 - 3. Excavating for paving and parking areas.
 - 4. Excavating for slabs-on-grade.
 - 5. Excavating for site structures.

- B. Related Sections:
 - 1. Section 31 05 13 - Soils for Earthwork: Stockpiling excavated materials.
 - 2. Section 31 23 17 - Trenching: Excavating for utility trenches.
 - 3. Section 31 23 23 - Fill.
 - 4. Section 33 11 16 - Site Water Utility Distribution Piping.

1.2 REFERENCE STANDARDS

- A. Local utility standards when working within 24 inches of utility lines.

1.3 QUALITY ASSURANCE

- A. Perform Work in accordance with Caltrans Standard Plans.

PART 2 – PRODUCTS – NOT USED

PART 3 - EXECUTION

3.1 PREPARATION

- A. Notify affected utility companies and owner not less than three working days before performing Work.
 - 1. Request underground utilities to be located and marked within and surrounding construction areas. Conduct additional utility locating including ground penetrating radar, potholing and other means.

- B. Identify required lines, levels, contours, and datum.

- C. Protect utilities indicated to remain from damage.

- D. Protect plant life, and other features remaining as portion of final landscaping.

- E. Protect bench marks, survey control points and existing structures from excavating equipment and vehicular traffic.

3.2 EXCAVATION

- A. Excavate subsoil to accommodate utilities, structures, channels, swales, and other improvements.
- B. Compact backfills in accordance with Section 31 23 23 and Section 31 23 17.
- C. Slope banks with machine to angle of repose or less until shored.
- D. Do not interfere with 45 degree bearing splay of foundations.
- E. Grade top perimeter of excavation to prevent surface water from draining into excavation.
- F. Trim excavation. Remove loose matter.
- G. Remove lumped subsoil, boulders, and rock as specified in Section 31 23 23.
- H. Notify Engineer of unexpected subsurface conditions.
- I. Correct areas over excavated with structural fill Type specified in Section 31 23 23.
- J. Remove excess and unsuitable material from site.
- K. Stockpile excavated material in area designated on site in accordance with Section 31 05 13.
- L. Repair or replace items indicated to remain damaged by excavation.

3.3 FIELD QUALITY CONTROL

- A. Section 01 40 00 - Quality Requirements: Field inspecting, testing, adjusting, and balancing.
- B. Request visual inspection of bearing surfaces by Geotechnical Engineer before installing subsequent work.

3.4 PROTECTION

- A. Prevent displacement or loose soil from falling into excavation; maintain soil stability.
- B. Protect structures, utilities and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth operations.

END OF SECTION

SECTION 31 23 23 - FILL

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Backfilling building perimeter to subgrade elevations.
 - 2. Backfilling site structures to subgrade elevations.
 - 3. Fill under slabs-on-grade.
 - 4. Fill under paving.
 - 5. Fill for over-excavation.

- B. Related Sections:
 - 1. Section 31 05 13 - Soils for Earthwork: Soils for fill.
 - 2. Section 31 23 16 - Excavation.
 - 3. Section 31 23 17 - Trenching: Backfilling of utility trenches.
 - 4. Section 33 11 16 - Site Water Utility Distribution Piping.
 - 5. Section 33 46 00 - Subdrainage: Filter aggregate and filter fabric.

1.2 REFERENCES

- A. American Association of State Highway and Transportation Officials:
 - 1. AASHTO T180 - Standard Specification for Moisture-Density Relations of Soils Using a 10-lb Rammer and a 18-in. Drop.

- B. ASTM International:
 - 1. ASTM D698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³).
 - 2. ASTM D1556 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.
 - 3. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³).
 - 4. ASTM D2167 - Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.
 - 5. ASTM D6938 - Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).

1.3 SUBMITTALS

Submit the following:

- A. Product Data: Submit data for geotextile fabric indicating fabric and construction.

PART 2 - PRODUCTS

2.1 FILL MATERIALS

- A. Subsoil Fill: Select Fill as specified in Section 31 05 13.
- B. Structural Fill: Aggregate Base as specified in Section 31 05 16.
- C. Granular Fill: Aggregate Subbase as specified in Section 31 05 16.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify subdrainage, dampproofing, or waterproofing installation has been inspected.
- B. Verify structural ability of unsupported walls to support loads imposed by fill.

3.2 PREPARATION

- A. Compact subgrade to density requirements for subsequent backfill materials.
- B. Cut out soft areas of subgrade not capable of compaction in place. Backfill with select fill and compact to density equal to or greater than requirements for subsequent fill material.
- C. Scarify subgrade surface to depth of 6 inch.
- D. Proof roll to identify soft spots; fill and compact to density equal to or greater than requirements for subsequent fill material.

3.3 BACKFILLING

- A. Backfill areas to contours and elevations specified.
- B. Systematically backfill to allow maximum time for natural settlement. Do not backfill over porous, wet, or spongy subgrade surfaces.
- C. Place material in continuous layers as follows:
- D. Subsoil Fill: Select Fill, maximum 8 inches loose depth.
- E. Structural Fill: Coarse Aggregate Base, maximum 6 inches loose depth.
- F. Granular Fill: Coarse Aggregate Subbase, maximum 6 inches loose depth.
- G. Employ placement method that does not disturb or damage other work.
- H. Maintain optimum moisture content of backfill materials to attain required compaction density.
- I. Backfill against supported foundation and retaining walls. Do not backfill against unsupported foundation and retaining walls.
- J. Backfill simultaneously on each side of unsupported foundation walls until supports are in place.
- K. Slope grade away from building minimum 2 percent slope for minimum distance of 10 ft, unless noted otherwise.
- L. Make gradual grade changes. Blend slope into level areas.
- M. Remove surplus backfill materials from site.
- N. Leave fill material stockpile areas free of excess fill materials.

3.4 TOLERANCES

- A. Top Surface of Backfilling Within Building Areas: Plus or minus 1 inch from required elevations.
- B. Top Surface of Backfilling Under Paved Areas: Plus or minus 1/2 inch from required elevations.
- C. Top Surface of General Backfilling: Plus or minus 1 inch from required elevations.

3.5 FIELD QUALITY CONTROL

- A. Perform laboratory material tests in accordance with ASTM D698.
- B. Perform in place compaction tests in accordance with the following:
- C. Density Tests: ASTM D1556 or ASTM D6938.
- D. Moisture Tests: ASTM D6938.
- E. When tests indicate Work does not meet specified requirements, remove Work, replace and retest.
- F. Frequency of Tests: one test for each 1,000 square feet of each lift of fill material.
- G. Proof roll compacted fill surfaces under slabs-on-grade and paving.

3.6 PROTECTION OF FINISHED WORK

- A. Reshape and re-compact fills subjected to vehicular traffic.
SCHEDULE

All compacted fill shall conform to the plans or as follows

- B. Interior Slab-On-Grade:
1. Select Fill, compacted to 95 percent. Cover with Structural Fill, compact uniformly to 95 percent of maximum density.
- C. Exterior Side of Foundation Walls and Retaining Walls:
1. Select Fill, to subgrade elevation. Each lift, compact uniformly to 95 percent of maximum density.
- D. Fill Under Grass and Landscaped Areas:
1. Select Fill, to 6 inches below finish grade, compact uniformly to 80 percent of maximum density.
- E. Fill For Berming:
1. Select Fill, to 12 inches below finish grade, compact uniformly to 90 percent of maximum density.
- F. Fill Under Asphalt and Concrete Paving:
1. Compact subsoil to 95 percent of its maximum dry density.
- G. Coarse Aggregate Subbase Fill, to 6 inches below bottom paving elevation, compact uniformly to 95 percent of maximum density.
- H. Coarse Aggregate Base Fill, to bottom paving elevation, compact uniformly to 95 percent of maximum density.
- I. Fill to Correct Over-excavation:
1. Select Fill, flush to required elevation, compact uniformly to 95 percent of maximum density.

END OF SECTION

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DIVISION 32
EXTERIOR IMPROVEMENTS

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SECTION 32 11 23 - AGGREGATE BASE COURSES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Aggregate subbase.
 - 2. Aggregate base course.
- B. Unless otherwise noted, the Contractor shall provide all materials, equipment, and labor necessary to produce finished Work as shown on the Drawings and as specified herein.
- C. Related Sections:
 - 1. Section 31 05 13 – Soils for Earthwork
 - 2. Section 31 05 16 – Aggregates for Earthwork
 - 3. Section 31 23 17 - Trenching: Compacted fill under base course.
 - 4. Section 31 23 23 - Fill: Compacted fill under base course.
 - 5. Section 32 12 16 - Asphalt Paving: Binder and finish asphalt courses.
 - 6. Section 32 13 13 - Concrete Paving: Finish concrete surface course.
 - 7. Section 33 05 13 - Manholes and Structures: Manholes including frames.

1.2 REFERENCES

- A. ASTM International:
 - 1. ASTM D1556 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.
 - 2. ASTM D2940 - Standard Specification for Graded Aggregate Material for Bases or Subbases for Highways or Airports.
 - 3. ASTM D6938 - Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).

1.3 SUBMITTALS

- A. Materials Source: Submit name of imported materials suppliers and Test Data.

1.4 QUALITY ASSURANCE

- A. Furnish each aggregate material from single source throughout the Work
- B. Perform Work in accordance with Caltrans Standard Plans.
- C. Furnish test results as requested by Engineer

PART 2 - PRODUCTS

2.1 AGGREGATE MATERIALS

- A. Coarse Aggregate Subbase: As specified in Section 31 05 13.
- B. Coarse Aggregate Base: As specified in Section 31 05 16.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify compacted substrate is dry and ready to support paving and imposed loads.
 - 1. Proof roll substrate with fully loaded 10 cu yd. dump truck in minimum two perpendicular passes to identify soft spots.
 - 2. Remove soft substrate and replace with compacted fill as specified in Section 31 23 23.
- B. Verify substrate has been inspected, gradients and elevations are correct.

3.2 PREPARATION

- A. Correct irregularities in substrate gradient and elevation by scarifying, reshaping, and re-compacting.
- B. Do not place fill on soft or muddy surfaces.

3.3 AGGREGATE PLACEMENT

- A. Spread aggregate over prepared substrate and matting to total compacted thickness of minimum 6 inches as indicated on Drawings.
- B. Roller compact (or equivalent) aggregate to 95 percent maximum density per ASTM D698.
- C. Level and contour surfaces to elevations, profiles, and gradients indicated.
- D. Add small quantities of fine aggregate to coarse aggregate when required to assist compaction.
- E. Maintain optimum moisture content of fill materials to attain specified compaction density.
- F. Use mechanical tamping equipment in areas inaccessible to compaction equipment.

3.4 TOLERANCES

- A. Maximum Variation from Elevation: 1/4 inch measured with 10 foot straight edge.

3.5 FIELD QUALITY CONTROL

- A. Perform in place compaction tests in accordance with the following:
 - 1. Density Tests: ASTM D1556 or ASTM D6938.
 - 2. Moisture Tests: ASTM D6938.
- B. When tests indicate Work does not meet specified requirements, remove Work, replace and retest.
- C. Frequency of Tests: One test for every 1000 square feet of each layer compacted aggregate.

3.6 COMPACTION

- D. Compact materials to 95 percent of maximum density.

END OF SECTION

SECTION 32 12 16 - ASPHALT PAVING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Asphalt materials.
 - 2. Aggregate materials.
 - 3. Aggregate subbase.
 - 4. Asphalt paving base course, binder course, and wearing course.
 - 5. Surface slurry.
- B. Unless otherwise noted, the Contractor shall provide all materials, equipment, and labor necessary to produce finished Work as shown on the Drawings and as specified herein.
- C. Related Requirement:
 - 1. Section 31 23 23 - Fill: Compacted subbase for paving.
 - 2. Section 32 11 23 - Aggregate Base Courses: Compacted subbase for paving.
 - 3. Section 32 91 13 – Soil Preparation: Preparation of subsoil at pavement perimeter.
 - 4. All work is to be completed in conformance with encroachment permit requirements.

1.2 REFERENCE STANDARDS

- A. State Specification:
 - 1. Caltrans Standard Plans.
- B. American Association of State Highway and Transportation Officials:
 - 1. AASHTO M17 - Standard Specification for Mineral Filler for Bituminous Paving Mixtures.
 - 2. AASHTO M29 - Standard Specification for Fine Aggregate for Bituminous Paving Mixtures.
 - 3. AASHTO M140 - Standard Specification for Emulsified Asphalt.
 - 4. AASHTO M320 - Standard Specification for Performance-Graded Asphalt Binder.
 - 5. AASHTO M324 - Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements.
 - 6. AASHTO MP1a - Standard Specification for Performance-Graded Asphalt Binder.
- C. Asphalt Institute:
 - 1. AI MS-2 - Mix Design Methods for Asphalt Concrete and Other Hot- Mix Types.
 - 2. AI MS-19 - Basic Asphalt Emulsion Manual.
- D. ASTM International:
 - 1. ASTM D946 - Standard Specification for Penetration-Graded Asphalt Cement for Use in Pavement Construction.
 - 2. ASTM D977 - Standard Specification for Emulsified Asphalt.
 - 3. ASTM D1188 - Standard Test Method for Bulk Specific Gravity and Density of Compacted Bituminous Mixtures Using Coated Samples
 - 4. ASTM D2726 - Standard Test Method for Bulk Specific Gravity and Density of Non-Absorptive Compacted Bituminous Mixtures.
 - 5. ASTM D2950 - Standard Test Method for Density of Bituminous Concrete in Place by Nuclear Methods.

6. ASTM D3381 - Standard Specification for Viscosity-Graded Asphalt Cement for Use in Pavement Construction.
7. ASTM D3549 - Standard Test Method for Thickness or Height of Compacted Bituminous Paving Mixture Specimens.
8. ASTM D3910 - Standard Practices for Design, Testing, and Construction of Slurry Seal.
9. ASTM D6690 - Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements.

1.3 SUBMITTALS

- A. Product Data:
 1. Submit product information for asphalt and aggregate materials.
 2. Submit mix design with laboratory test results supporting design.
- B. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.

1.4 SUSTAINABLE DESIGN SUBMITTALS

- A. Manufacturer's Certificate: Certify products meet or exceed specified sustainable design requirements.
 1. Materials Resources Certificates:
 - a. Certify recycled material content for recycled content products.

1.5 QUALITY ASSURANCE

- A. Mixing Plant: Conform to OICC Marianas 123C standards.
- B. Obtain materials from same source throughout.
- C. Perform Work in accordance with OICC Marianas 123C standards.

1.6 QUALIFICATIONS

- A. Installer: Company specializing in performing work of this section with minimum 5 years documented experience.

1.7 AMBIENT CONDITIONS

- A. Do not place asphalt mixture when surface is wet.
- B. Place asphalt mixture when temperature is between 225 and 300 degrees F.

PART 2 - PRODUCTS

2.1 ASPHALT PAVING

- A. Performance / Design Criteria: meet requirements of OICC Marianas 123C.
- B. Asphalt Materials:
 1. Asphalt Cement: ASTM D3381 matching requirements of OICC Marianas 123C.
 2. Tack Coat: In accordance with OICC Marianas 123C, Section 7.
 3. Reclaimed Asphalt Pavement (RAP): Processed material obtained by milling or full depth removal of existing asphalt paving.
 4. Oil: In accordance with OICC Marianas 123C.
- C. Aggregate Materials:

1. Coarse Aggregate: In accordance with Section 31 05 16 Coarse Aggregate Base.
2. Fine Aggregate: In accordance with Section 31 05 16 Fine Aggregate.

D. Aggregate Subbase: Specified in Section 32 11 23.

2.2 MIXES

- A. Use dry material to avoid foaming. Mix uniformly.
- B. Asphalt Paving Mixtures: Designed in accordance with OICC Marianas 123C, Section 10.
- C. Surface Slurry: In accordance with OICC Marianas 123C, Section 11.

2.3 SOURCE QUALITY CONTROL

- A. Section 01 40 00 - Quality Requirements: Testing, inspection and analysis requirements.
- B. Submit proposed mix design for review prior to beginning of Work.
- C. Test samples in accordance with OICC Marianas 123C, Section 10.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for installation examination.
- B. Verify utilities indicated under paving are installed with excavations and trenches backfilled and compacted.
- C. Verify compacted subbase is dry and ready to support paving and imposed loads.
 1. Proof roll subbase with fully loaded 10 yard dump truck in minimum two perpendicular passes to identify soft spots.
 2. Remove soft subbase and replace with compacted fill as specified in Section 31 23 23.
- D. Verify gradients and elevations of base are correct.
- E. Verify gutter drainage grilles and frames, manhole frames, and cleanout and valve covers are installed in correct position and elevation.

3.2 PREPARATION

- A. Prepare subbase in accordance with OICC Marianas 123C, Section 4.

3.3 DEMOLITION

- A. Saw cut and notch existing paving.
- B. Clean existing paving to remove foreign material, excess joint sealant and crack filler from paving surface.

3.4 INSTALLATION

- A. Subbase:
 1. Aggregate Subbase: Install as specified in Section 32 11 23.
- B. Primer:
 1. Apply primer in accordance with OICC Marianas 123C.

C. Tack Coat:

1. Apply tack coat on asphalt and concrete surfaces at uniform rate in accordance with OICC Marianas 123C.
2. Apply tack coat to contact surfaces of curbs, gutters and slabs.
3. Coat surfaces of manhole and catch basin frames with oil to prevent bond with asphalt paving. Do not tack coat these surfaces.

D. Single Course Asphalt Paving:

1. Install Work in accordance with OICC Marianas 123C, Section 10.
2. Place asphalt within 24 hours of applying primer or tack coat.
3. Place asphalt wearing course to thickness indicated on Drawings.
4. Compact paving by rolling to specified density. Do not displace or extrude paving from position. Hand compact in areas inaccessible to rolling equipment.
5. Perform rolling with consecutive passes to achieve even and smooth finish without roller marks.

3.5 TOLERANCES

- A. Section 01 40 00 - Quality Requirements: Tolerances.
- B. Flatness: Maximum variation of 1/4 inch measured with 10 foot straight edge.
- C. Scheduled Compacted Thickness: Within 1/4 inch.
- D. Variation from Indicated Elevation: Within 1/2 inch.

3.6 FIELD QUALITY CONTROL

- A. Take samples and perform tests in accordance with OICC Marianas 123C.
- B. Asphalt Paving Mix Temperature: Measure temperature at time of placement.
- C. Asphalt Paving Thickness: ASTM D3549; test one core sample from every 1000 square yards compacted paving.
- D. Asphalt Paving Density: ASTM D2950 nuclear method; test one location for every 1000 square yards compacted paving.

3.7 PROTECTION

- A. Immediately after placement, protect paving from mechanical injury for 6 hours or until surface temperature is less than 140 degrees F.

END OF SECTION

SECTION 32 12 16.36 - TRACK ASPHALT PAVING

PART 1 - GENERAL

1.1 SCOPE OF WORK

- A. Include all labor, material, transportation and services to complete installation of the aggregate base and asphalt paving as shown on the drawings for the track and field event areas including running track areas, areas around the pole vault runways, the steeplechase runways, and high jump area including:
1. Final subgrade establishment
 2. Base course aggregate
 3. Track and Field Event asphalt concrete paving (2 lifts)

1.2 STANDARD SPECIFICATIONS

- A. All sections of the standard specifications applicable to any and all parts of this project shall govern, except as specifically modified in these contract documents.
1. The Green Book Standard Specifications for Municipal Public Works Construction, California State Chapter (latest edition).
 2. American Public Works Associations, Standard Specifications for Municipal Public Works Construction, (APWA), latest edition.
 3. American Society for Testing and Materials (ASTM).
 4. American Association of State Highway and Transportation Officials, (AASHTO).

1.3 RELATED WORK SPECIFIED IN OTHER SECTIONS

1. Section 03 30 53 Miscellaneous Cast-In-Place Concrete
2. Section 31 22 16 Field and Track Subgrade Establishment
3. Section 32 18 23.10 Rubberized Track Surfacing

1.4 QUALIFICATIONS

- A. Asphalt Paving Contractor shall have completed the successful placement of asphalt paving on a minimum of 5 full size running tracks within the previous 2 years, and submit documentation of projects at the time of submittal.

1.5 SUBMITTALS

- A. Submit to the Field Landscape Architect for approval:
1. Class II aggregate sieve analysis
 2. Equipment and procedures to be utilized for the asphalt installation.
 3. Asphalt mix design or composition.
 4. Previous experience of the proposed asphalt installer with running track asphalt paving installations, including name of project, year completed, general contractor, owner contact, and contact phone numbers for each named individual.

PART 2 - MATERIALS

2.1 ASPHALT CONCRETE PAVING

- A. All machine-placed and hand-placed asphalt concrete pavement shall be either "Greenbook C2 Dense Medium or D2- Dense Fine".
- B. Thickness of running track and field event area pavement to be minimum 3-1/2" compacted

depth, placed on a minimum depth of 8" aggregate base installed over a compacted subgrade. The track asphaltic concrete pavement shall be installed in 2 lifts. The first lift shall be a minimum 2" compacted depth of C2 Dense Medium asphaltic pavement and the second lift shall be a minimum 1-1/2" compacted depth of D2 Dense Fine asphaltic pavement

- C. Weather limitations: Construct asphalt paving only when atmospheric temperature is above 40 degrees F., when underlying base is dry and weather is not rainy.
- D. Grade control: Establish and maintain the required lines and grades and cross-slope.

2.2 AGGREGATE BASE MATERIAL

- A. For asphalt concrete base, maximum size 3/4" uniformly graded from coarse to fine. Use Class II crushed rock surfacing.

2.3 ASPHALTIC CONCRETE

- A. Use asphalt mix formula of asphalt concrete producer in accordance with "Greenbook C2 Dense Medium and D2-Dense Fine".

PART 3 - EXECUTION

3.1 SUBGRADE

- A. Establish subgrade and thoroughly compact to minimum 95% of maximum dry density.

3.2 AGGREGATE BASE

- A. Place aggregate base only to existing compacted surface. Apply aggregate base and compact to a uniformly smooth hard surface with a minimum thickness of 6" or greater as required to conform to lines, grades and cross sections as shown or directed. Compact to a minimum of 95% of maximum dry density.

3.3 ASPHALTIC PAVING

- A. The grade tolerance of the compacted first lift of asphalt shall be +1/4" and -0". The asphalt shall not deviate from the true surface in excess of 1/4" on a 10' straight edge in all directions.
- B. The grade tolerance of the compacted second lift of asphalt shall be +1/8" and -0". The asphalt shall not deviate from the true surface in excess of 1/8" on a 10' straight edge in all directions.
- C. For the field event surfaced areas, the surface elevation of the final lift of paving, in the compacted condition, shall not deviate more than 1/8" from specified elevations. Trueness measurement to be taken from 10' long straight edge placed in all directions.
- D. All edges to be straight or a continuous smooth line retained by concrete curb. No reverse slopes or birdbaths will be allowed. The complete surface of the asphalt shall be of uniform texture, smooth uniform as to grade, and free from defects of all kinds. Verify elevation requirements prior to commencing paving.

3.4 HAND PLACING

- A. Spread, tamp, and finish mixture using hand tools in areas where machine spreading is not practical.
- B. Place mixture at rate that will ensure handling and compacting before mixture temperature drops below 230 degrees F.
- C. Edges must have a straight or continuous smooth line.

3.5 QUALITY CONTROL

- A. Prior to acceptance, all pavement shall be exposed to a "flood" test. When deviations in excess of the tolerances noted above or obvious depressions (birdbaths) are found, the pavement surface shall be corrected by the addition of asphalt concrete mixture of an appropriate class to low places or the removal of material from high places by methods satisfactory to the Field Landscape Architect or by removal and replacement of the asphaltic concrete.
- B. Corrections of defects shall be carried out until there are no deviations anywhere greater than the allowable tolerances. All areas in which the surface of the completed pavement deviates more than twice the allowable tolerances described above shall be removed and replaced to the Field Landscape Architect's satisfaction.
- C. When any corrections are made, the entire area shall have a seal coat applied except for those areas where a rubberized surfacing shall be applied, so as to produce a new, non-repaired appearing surface. All costs involved in making the corrections of the defects described above shall be borne by the Contractor, and no additional compensation shall be made for this work.

3.6 CLEANING

- A. After completion of paving operations, clean surfaces of excess or spilled asphaltic materials.

3.7 PROTECTION

- A. Protect asphaltic paving from all damage of every kind. Do not permit vehicular traffic on asphaltic paving until it has cooled and hardened and in no case sooner than six hours after placing.
- B. Provide barricades and warning devices as required. Protect soil and other site features where asphalt is being laid.

END OF SECTION 32 12 16.36
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SECTION 32 13 13 - CONCRETE PAVING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Aggregate base course.
 - 2. Concrete paving for:
 - a. Concrete sidewalks.
 - b. Concrete stair steps.
 - c. Concrete integral curbs.
 - d. Concrete median barriers.
 - e. Concrete parking areas.
- B. Unless otherwise noted, the Contractor shall provide all materials, equipment, and labor necessary to produce finished Work as shown on the Drawings and as specified herein.
- C. Related Requirements:
 - 1. Section 31 23 23 - Fill: Compacted subbase for paving.
 - 2. Section 32 11 23 - Aggregate Base Courses.
 - 3. Section 32 12 16 - Asphalt Paving: Asphalt wearing course.
 - 4. Section 32 91 13 - Soil Preparation: Preparation of subsoil at pavement perimeter.

1.2 REFERENCE STANDARDS

- A. Caltrans Standard Plans:
- B. American Concrete Institute:
 - 1. ACI 301 - Specifications for Structural Concrete.
 - 2. ACI 304 - Guide for Measuring, Mixing, Transporting, and Placing Concrete.
 - 3. ACI 305 - Hot Weather Concreting.
 - 4. ACI 308.1 - Standard Specification for Curing Concrete.
- C. ASTM International:
 - 1. ASTM A185/A185M - Standard Specification for Steel Welded Wire Fabric, Plain, for Concrete Reinforcement.
 - 2. ASTM A497/A497M - Standard Specification for Steel Welded Wire Fabric, Deformed, for Concrete Reinforcement.
 - 3. ASTM A615/A615M - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
 - 4. ASTM A775/A775M - Standard Specification for Epoxy-Coated Steel Reinforcing Bars.
 - 5. ASTM A884/A884M - Standard Specification for Epoxy-Coated Steel Wire and Welded Wire Reinforcement.
 - 6. ASTM C33 - Standard Specification for Concrete Aggregates.
 - 7. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
 - 8. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete.
 - 9. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic Cement Concrete.
 - 10. ASTM C150 - Standard Specification for Portland Cement.
 - 11. ASTM C260 - Standard Specification for Air-Entraining Admixtures for Concrete.
 - 12. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
 - 13. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete.

14. ASTM C1315 - Standard Specification for Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete.
15. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
16. ASTM D1752 - Standard Specification for Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction.

1.3 PRE-INSTALLATION MEETINGS

- A. Convene minimum one week prior to commencing work of this section.

1.4 SUBMITTALS

- A. Product Data:
 1. Submit data on concrete materials, joint filler, admixtures, and curing compounds.
- B. Design Data:
 1. Submit concrete mix design for each concrete strength. Submit separate mix designs when admixtures are required for the following:
 - a. Hot and cold weather concrete work.
 - b. Air entrained concrete work.
 - 1) Identify mix ingredients and proportions, including admixtures.
 - 2) Identify chloride content of admixtures and whether or not chloride was added during manufacture.
- C. Source Quality Control Submittals: Indicate results of factory tests and inspections.

1.5 QUALITY ASSURANCE

- A. Obtain cementitious and aggregate materials from same source throughout.

1.6 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three years documented experience.
- B. Installer: Company specializing in performing work of this section with minimum five years documented experience.

1.7 AMBIENT CONDITIONS

- A. Do not place concrete when base surface is wet.

PART 2 - PRODUCTS

2.1 AGGREGATE BASE COURSE

- A. Aggregate Base Course: As specified in Section 32 11 23.

2.2 CONCRETE PAVING

- A. Performance / Design Criteria:

1. Paving: Design for light duty commercial vehicles and movement of trucks and equipment up to 30,000 lbs.

B. Form Materials:

1. Form Materials: As specified in Section 03 30 00.
2. Joint Filler: ASTM D1751; Asphalt impregnated fiberboard or felt, 1/4 inch thick; tongue and groove profile.
3. Reinforcement: Reinforcing Steel and Wire Fabric: Type specified in Section 03 30 00.

C. Concrete Materials:

1. Cement, normal weight aggregates, and water: As specified in Section 03 30 00.

2.3 FABRICATION

- A. Fabricate reinforcing in accordance with CRSI Manual of Practice.
- B. Form standard hooks for 180 degree bends and 90 degree bends, as indicated on Drawings.

2.4 MIXES

- A. Concrete Mix - As per specified in Section 03 30 00.

2.5 FINISHES

- A. Shop Finishing - Reinforcement:
 1. Epoxy Coated Finish for Steel Bars: ASTM A775.
- B. Epoxy Coated Finish for Steel Wire: ASTM A884; Class A, using ASTM A775/A775M.

2.6 ACCESSORIES

- A. As specified in Section 03 30 00.

2.7 SOURCE QUALITY CONTROL

- A. Provide mix design for 3,000 and 4,000 psi concrete.
- B. Submit proposed mix design of each class of concrete to Engineer for review prior to commencement of Work.
- C. Tests on cement, aggregates, and mixes will be performed to ensure conformance with specified requirements.
- D. Test samples in accordance with ACI 301.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify compacted subbase is dry and ready to support paving and imposed loads.
 1. Proof roll subbase with fully loaded 10 cu yd. dump truck in minimum two perpendicular passes to identify soft spots.
 2. Remove soft subbase and replace with compacted fill as specified in Section 31 23 23.
- B. Verify gradients and elevations of base are correct.

- C. Verify requirements for concrete cover over reinforcement.
- D. Verify anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, positioned securely, and will not interfere with placing concrete.

3.2 PREPARATION

- A. Moisten substrate to minimize absorption of water from fresh concrete.
- B. Coat surfaces of manhole or catch basin frames with oil to prevent bond with concrete paving.
- C. Notify Engineer minimum 24 hours prior to commencement of concreting operations.

3.3 INSTALLATION

- A. Base Course:
 - 1. Aggregate Base Course: Install as specified in Section 32 11 23.
- B. Forms:
 - 1. Place and secure forms and screeds to correct location, dimension, profile, and gradient.
 - 2. Assemble formwork to permit easy stripping and dismantling without damaging concrete.
- C. Reinforcement:
 - 1. Place reinforcing as indicated on Drawings.
 - 2. Interrupt reinforcing at expansion joints.
 - 3. Place reinforcing to achieve paving and curb alignment as detailed.
- D. Placing Concrete:
 - 1. Place concrete in accordance with ACI 301 as specified in Section 03 30 00.
- E. Joints
 - 1. Place contraction joints at 20 foot intervals. Align curb, gutter, and sidewalk joints.
 - 2. Place joint filler between paving components and building or other appurtenances. Recess top of filler as indicated on the Drawings for sealant installation.
 - 3. Provide construction joints between sidewalks and curbs.
 - 4. Provide keyed joints as indicated.
 - 5. Saw cut contraction joints as indicated on Drawings.
 - 6. Seal joints as indicated on Drawings.
- F. Finishing:
 - 1. All concrete areas: Light broom.
 - 2. Sidewalk Paving: Light broom, radius to 1/2 inch radius, and trowel joint edges.
 - 3. Median Barrier: Light broom, radius to 1/2 inch radius, and trowel joint edges.
 - 4. Curbs and Gutters: Light broom.
 - 5. Direction of Texturing: Parallel to paving direction.
 - 6. Inclined Vehicular Ramps: Light broomed perpendicular to slope.
- G. Curing and Protection
 - 1. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.
 - 2. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.

3.4 TOLERANCES

- A. Maximum Variation of Surface Flatness: 1/4 inch in 10.
- B. Maximum Variation From True Position: 1/4 inch.

3.5 FIELD QUALITY CONTROL

- A. Field inspection and testing will be performed by Owner's testing laboratory in accordance with ACI 301 and under provisions of General Conditions.
- B. Inspect reinforcing placement for size, spacing, location, support.
- C. Testing firm will take cylinders and perform slump tests in accordance with ACI 301.
- D. Concrete Inspections:
 - 1. Continuous Placement Inspection: Inspect for proper installation procedures.
 - 2. Periodic Curing Inspection: Inspect for specified curing temperature and procedures.
- E. Strength Test Samples:
 - 1. Sampling Procedures: ASTM C172.
 - 2. Cylinder Molding and Curing Procedures: ASTM C31/C31M, cylinder specimens, field cured.
 - 3. Sample concrete and make one set of three cylinders for every 100 cu yds or less of each class of concrete placed each day and for every 5,000 sf of surface area for slabs and walls.
 - 4. When volume of concrete for any class of concrete would provide less than 5 sets of cylinders, take samples from five randomly selected batches, or from every batch when less than 5 batches are used.
 - 5. Make one additional cylinder during cold weather concreting, and field cure.
- F. Field Testing:
 - 1. Slump Test Method: ASTM C143/C143M.
 - 2. Air Content Test Method: ASTM C173/C173M.
 - 3. Temperature Test Method: ASTM C1064/C1064M.
 - 4. Measure slump and temperature for each compressive strength concrete sample.
 - 5. Measure air content in air entrained concrete for each compressive strength concrete sample.
- G. Cylinder Compressive Strength Testing:
 - 1. Test Method: ASTM C39/C39M.
 - 2. Test Acceptance: In accordance with ACI 318.
 - 3. Test one cylinder at 7 days.
 - 4. Test two cylinders at 28 days.
 - 5. Retain one for testing when requested by Engineer.
 - 6. Dispose remaining cylinders when testing is not required.
- H. Maintain records of placed concrete items. Record date, location of pour, quantity, air temperature, and test samples taken.

3.6 PROTECTION

- A. Immediately after placement, protect paving from premature drying, excessive hot or cold temperatures, and mechanical injury.
- B. Do not permit vehicular traffic over paving until 75 percent design strength of concrete has been achieved.

3.7 SCHEDULE

- A. Concrete Sidewalks and Median Barrier: 3,000 psi 28 day concrete, 4 inches thick, buff color Portland cement.
- B. Parking and Storage Area, and Ramp Paving: 4,000 psi 28 day concrete, 12 inches thick.

END OF SECTION

SECTION 32 18 23 - SYNTHETIC TURF SURFACING

PART 1 - GENERAL

1.1 SCOPE OF WORK

- A. Scope of work to include all labor, material, equipment, transportation and services to install complete new vertically draining in-filled synthetic turf surfacing system as shown and described. System to be as herein specified including, but not specifically limited to the following:
1. The field shall be manufactured from monofilament fibers. Color of turf shall include panels of medium green with white, yellow, red, and black tufted markings and white, yellow, red, and black inlaid markings.
 2. Markings shall include football and soccer as well as solid black end zone panels with end zone letters and a mid-field logo.
 3. Field Infill System shall consist of a combination of sand and SBR rubber.
 4. ADDITIVE ALTERNATE #1: Installation of field underlayment/supplemental pad system consisting of either a 25mm polypropylene panels or a 25mm paved in place Elastic Layer Pad at the field area within the track surfacing.
- B. Common requirements of synthetic turf regardless of site location shall include:
1. Product submittals including samples, technical data, shop drawings etc.
 2. Independent testing of the synthetic turf materials prior to shipment to the project site;
 3. Delivery of the synthetic turf materials (not including infill) a minimum of 1 week prior to the scheduled installation of the materials;
 4. Review and acceptance or certification of the permeable aggregate as it applies to installation of turf system, permeability and warranty implementation;
 5. Installation of complete vertical draining synthetic turf surfacing system.
 6. Installation of tufted and inlaid field lines and markings as indicated on the drawings.
 7. Provide extra turf materials to the Owner for future repair and protective purposes.
 8. Provide all appropriate maintenance and repair manuals and warranty package to Owner.

1.2 SYNTHETIC TURF SURFACING PERFORMANCE & PAYMENT BOND

- A. The Synthetic Turf Contractor/Vendor shall provide a performance and payment bond to the General Contractor for the full subcontract amount of the synthetic turf surfacing system including materials, assembly, shipping, and installation. A copy of the performance and payment bond must be provided to the Owner within 14 days of the issuance of the notice to proceed.
- B. The performance and payment bond must be provided in the name of the same corporate entity that provides the warranty for the synthetic turf surfacing system to the Owner.

1.3 SYNTHETIC TURF SURFACING

- A. The following Synthetic Turf Contractor/Vendors and corresponding products are pre-approved for the Synthetic Turf Field surface:
- | | | |
|----|-----------------------------|------------------|
| 1. | AstroTurf – Rhino M | AstroTurf |
| 2. | FieldTurf / Tarkett – Core | FieldTurf |
| 3. | Hellas – Matrix Power Blade | Hellas |
| 4. | Shaw Sports Field – | Shaw Sports Turf |
- B. All synthetic turf contractors/vendors that are not included as a pre-approved product shall

submit a substitution request in accordance with the Instructions to Bidders. The substitution request must be submitted a minimum of 6 business days prior to the bid opening. Substitution requests must include the following information for evaluation by the Owner and Field Landscape Architect.

1. Vendor Background and Experience: Describe your firm's history. Include information identifying the firm's annual volume and the firm's stability in the marketplace. Also include the firm's record relating to installation schedules and performance.
2. Provide information regarding local representation, and post-installation support.
3. Provide proof of bondability.
4. Product Manufacturer Background and Experience: Describe the history and experience of the product manufacturer with this specific product including years of experience and a count and listing of North American and worldwide synthetic turf field installations. The list shall include field locations, client, client contact names, address, telephone, material installed, date of installation, and general contractor (if any).
5. Product Installer Background and Experience: Describe the history and experience of the product installer with this specific product including years of experience and a count and listing of field installations. The list shall include field locations, client, client contact names, address, telephone, material installed, date of installation, and general contractor (if any). If the installer is not the manufacturer or vendor of the product, describe the experience the installer has with this specific product.
6. Product Samples: Provide the following samples with the substitution request.
Two 8"x 12" samples each of green turf without infill material showing backing with perforations.
Two 8" x 12" samples each of turf with the infill material.
Two samples of the proposed in-fill material.
7. Product Specification: Provide specification for the proposed synthetic turf product. Note any required deviations from the In-filled Synthetic Turf Technical Specifications included in this section.
8. Product Performance: The samples submitted with the proposal will be reviewed and evaluated. As a supplement to the samples, provide a written description of the following performance criteria for the proposed synthetic turf surfacing system:
 - a. Abrasive characteristics
 - b. Weekly, Monthly, and Annual Maintenance Requirements
 - c. Playability for Soccer, Softball, Lacrosse, & Rugby
 - d. Wet and Dry Traction
9. References: Supply a minimum of ten references, including contact name and telephone number, for other installations of this product.

1.4 APPROVED FIBER MANUFACTURERS

- A. The following fiber manufacturers are pre-approved for the In-filled Synthetic Turf Systems:

Astroturf, Bonar, Fieldturf, Hellas, Polytex, Shaw, Tencate

- B. The synthetic turf Contractor/Vendor shall provide written documentation in the form of a signed affidavit certifying the source of the fiber used for the field including both green and any other colors used for the lines and markings.
- C. Fiber shall be certified in writing to have less than 50 ppm or less of lead from both the fiber supplier and the turf vendor.

1.5 MINIMUM QUALIFICATIONS FOR SYNTHETIC TURF SYSTEM

- A. Approved Synthetic Turf System shall be manufactured, sold, and warranted by a single

vendor. Manufacture of the system shall include, at a minimum, assembly of the constituent components, including tufting and coating, of the specified fiber into an approved backing.

- B. The manufacturer of the synthetic turf system must have produced a minimum of fifty (50) successful in-filled fields of full size and outdoors within the past two (2) years.
- C. Installer of the synthetic turf system must have installed either a minimum of ten (10) successful in-filled synthetic turf football or soccer fields of full size within the past two (2) years or a minimum of twenty (20) successful in-filled synthetic turf football or soccer fields of full size within the past five (5) years. The installer shall have installed a minimum of five (5) successful in-filled synthetic turf football or soccer fields of full size with the product vendor.
- D. The synthetic turf surfacing system vendor shall have a designated employed representative available for service based in Southern California.
- E. The synthetic turf warranty shall be a comprehensive warranty, insured, for 8 years including all materials and workmanship including, but not limited to fiber, backing, secondary coating, infill and installation of the entire synthetic turf system. Separate, compartmentalized warranties for specific portions shall not be acceptable.

1.6 RELATED WORK SPECIFIED IN OTHER SECTIONS

- A. 03 30 53 Miscellaneous Cast-In-Place Concrete
- B. 31 22 16 Field and Track Subgrade Establishment

1.7 STANDARD SPECIFICATIONS

- A. For standards: American Society for Testing Materials (ASTM), (latest edition).
- B. The Green Book Standard Specifications for Municipal Public Works Construction, California State Chapter (latest edition).

1.8 POST AWARD SUBMITTALS

- A. Shop Drawings: Within 5 calendar days after issuance of Notice to Proceed, submit to the Field Landscape Architect an electronic copy of complete and detailed drawings showing all component parts of the synthetic turf system. The shop drawings shall be drawn to scale (1"=20') and shall include:
 - 1. total depth of infill
 - 2. edge details
 - 3. insert details including backing material
 - 4. seam details
 - 5. seam layout
 - 6. gluing patterns
 - 7. dimensional shop drawing for all field lines, markings and boundaries
- B. Synthetic Turf Samples: Within 5 calendar days after issuance of Notice to Proceed submit to the Field Landscape Architect:
 - 1. Two 12"x 12" samples each of each color turf showing backing with perforations.
 - 2. Two 12" x 12" samples each of turf showing method of seam makeup with perforations. One sample to have an example of inlaid lines.
 - 3. Two 12" x 12" samples each of the other colors proposed for use on the field for lines and markings.
 - 4. Two 1-pound samples of the proposed In-fill material(s).
- C. Manufacturer's Specifications and Warranty:

1. Submit to the Field Landscape Architect one electronic copy of selected manufacturer's material specifications and installation instructions. Include detailed specifications of manufacturer's provisions for achieving permeability, stating rate in infiltration and permeability in inches per hour of system materials for the vertical draining system.
 2. Within 10 calendar days after Notice to Proceed, submit to the Field Landscape Architect an electronic sample copy of warranty package herein specified for review. Preliminary approval of warranty shall be a prerequisite for acceptance of the turf manufacturer/vendors product.
- D. Testing and Quality Control: Within 5 calendar days after issuance of Notice to Proceed, submit to the Field Landscape Architect the following test results for the system specified. An independent testing laboratory experience with testing of synthetic turf or carpeting materials shall certify these tests. The qualifications of the testing laboratory to be utilized for the submittal and the pre-shipment testing shall be submitted to the Field Landscape Architect for approval. Applicable minimum material ASTM tests:
1. Dynamic Cushion Test - ASTM F355, Procedure A, (system); ASTM F355 procedure A at the 24" drop.
 2. Yarn and fabric characteristics.
 3. Pill Burn Test – ASTM D2859
- E. Maintenance and Operating Data:
1. Prior to acceptance and/or occupancy by the Owner, furnish to the Field Landscape Architect one electronic copy and five (5) copies in hard cover form of maintenance and operating data with imprinted Project, Owner, Field Landscape Architect, Contractor and Turf Subcontractor names, and date of turf system installation.
 2. In addition, provide descriptions of any equipment recommended for maintenance and repair, citing specific vendors for each unit.
 3. Use and Limitations - Provide a separate page stating approved activity usage for the turf and activities not recommended relative to warranty.
 4. Index - Index with tab dividers for data as follows: Materials installed with their characteristics:
 - a. General maintenance
 - b. Small repair procedures
 - c. Minor seam repair
 - d. Discussion of precautions to be practiced, general maintenance, and uses to avoid to protect turf surface and to maintain installation's warranty
 - e. Recommendations for paint application and removal of lines and markings.

1.9 PRE-SHIPMENT SUBMITTALS

- A. Prior to shipment of the synthetic turf materials to the job site, synthetic turf material from every sixth roll shall be randomly sampled and the tested by an independent testing laboratory experience with testing synthetic turf materials. The testing laboratory shall be completely independent with no ties to the turf manufacturer. The testing shall include the following:

<u>Item</u>	<u>ASTM</u>	<u>Property</u>
1.	FTIR Spectrograph	Pile Composition
2.	D418	Pile Weight
3.	D418	Total Weight
4.	D418	Pile Height
5.	D418	Backing Perforation Diameter and Spacing
6.	D1335	Tuft Bind (without infill)
7.	D1682	Grab/Tear Strength.

- B. Copies of the test results shall be transmitted to the Owner and Field Landscape Architect

directly from the testing laboratory. The synthetic turf materials shall not be shipped to the site without written authorization from the Field Landscape Architect after the Owner and Field Landscape Architect have approved the test results.

- C. Samples of the synthetic turf material tested from every sixth (6th) roll shall also be transmitted to the Field Landscape Architect for approval by the independent testing laboratory prior to shipment of the synthetic turf materials to the job site. Sample size shall be minimum 12" x 12".
- D. All fees and costs associated with the pre-shipment sampling and testing shall be paid by the Contractor.

1.10 CERTIFICATION OF THE BASE

- A. The Synthetic Turf Surfacing Contractor shall furnish to the Owner, prior to the synthetic turf system installation as applicable, a written certification of the acceptability by the turf vendor of the permeable aggregate for installation and warranty validation.

1.11 TURF SYSTEM HOLD HARMLESS

- A. The synthetic turf manufacturer and installer shall not infringe upon any current or pending patents held by other synthetic turf manufacturers or installers.
- B. The Contractor, their synthetic turf subcontractor, and the synthetic turf manufacturer shall hold the Owner, Owner's Representative, and the Field Landscape Architect harmless from infringement of any current or future patent issued for the synthetic turf surfacing system, installation methods and vertical draining characteristics. A notarized statement shall be provided as part of the submittal package.

1.12 WARRANTY OF SYNTHETIC TURF

- A. Warranty shall cover, in general, the usability of the turf surface, accessories, use characteristics, and suitability of the installation. All items covered by warranty are to be replaced or repaired with new materials, including installation at the sole expense of the warranting vendor/contractor for the period of eight (8) years to the Owner, for the designated uses enumerated as follows:
 1. Football
 2. Soccer
 3. Track and Field activities
 4. Physical exercises
 5. Physical education activities
 6. Pneumatic rubber-tired maintenance and service vehicles
 7. Pedestrian traffic and other similar uses
 8. Ceremonial and Entertainment Events
- B. A principal of the applicable firm, duly-authorized to make contracts, shall sign the turf vendor warranty. If the turf vendor is not the manufacturer, the manufacturing firm shall also sign the warranty. The term "Contractor" contained herein means the firm furnishing warranty. "Owner" is the College of the Redwoods. Warranty period shall be a minimum of eight years from date of acceptance of the installed system by the Owner.
- C. Furnish a pre-paid insurance policy in support of the warranty required for the field, for the entire warranty period from an A-rated domestic insurance carrier. The warranty shall be secured to the Owner with an insurance policy of not less than \$300,000 per claim and an aggregate of \$5,000,000.

1.13 FORM OF WARRANTY OF SYNTHETIC TURF SYSTEM

- A. Contractor/Vendor hereby warrants to Owner, subject to the limitations and conditions set forth below, that its synthetic turf system consisting of synthetic turf described as

- _____ , and the adhesives used in the installation, is free from defects in material and workmanship and shall, for a period of eight years as applicable from the date of acceptance by the Owner, remain serviceable for multiple sports activities.
- B. Contractor/Vendor warrants to the Owner that its synthetic turf materials shall not fade, fail, shrink, wrinkle, or reflect excessive wear. Contractor/Vendor shall, at their sole expense and cost, replace such areas of the synthetic turf system not performing to these standards for the life of the warranty.
- C. Definitions
1. The term "not fade" in the context of this warranty shall mean that the synthetic turf material shall remain a uniform shade of green, or other colors installed, with no significant loss of color.
 2. The term "not fail" or "excessive wear" as used in the context of this warranty shall mean that the length and weight of the face yarn or pile material in the synthetic turf surface above the infill materials shall not have been decreased by more than 10% per year according to ASTM D418, nor exceed 50% during the warranty period. In the event that the synthetic turf system does not retain its fiber height or shock absorbency and is consequently no longer serviceable during the warranty period, the Contractor shall, at their sole expense, replace such portion of the system that is no longer serviceable.
 3. The term "serviceable" in the context of this warranty shall mean that the synthetic turf system for the soccer field shall have a maximum "G" value according to ASTM F1936-10 and Procedure A, ASTM F355, not to exceed 120G's at any location upon installation and shall not exceed 160G's throughout life of the warranty period. This shall be determined by conducting dynamic cushioning tests at the locations designated in ASTM F1936-10 and at corners of the soccer penalty boxes at opposite sides of the field. Any increase from 120G's to allowable 160-G's maximum shall be at a relative uniform rate not to exceed 15 G's in any single yearly period.
- D. Where applicable, the fabric seams shall remain attached to the underlying surface over the warranty period and shall not separate or become unglued or unattached, as applicable.
- E. Contractor/Vendor warrants to the Owner that the permeable synthetic system shall drain vertically a minimum of 20 inches precipitation per hour without visible surface ponding.
- F. Contractor/Vendor shall replace with new materials, at their sole expense, any damage to the synthetic turf system that extends more than 3 feet beyond the location of foreign combustibles, which may ignite and fire-damage the synthetic turf system. The Contractor shall not be held liable for any incidental or consequential damages. These warranties and the Contractor's obligations here-under are expressly conditioned upon;
1. The Owner making all minor repairs to the synthetic turf system upon the discovery of the need for such repairs;
 2. The Owner maintaining and properly caring for the synthetic turf system in accordance with the Contractor's maintenance manual and instructions;
 3. The Owner complying with the dynamic and static load specifications established by the Contractor.
- G. The warranty is not to cover any defect, failure, damage or undue wear in or to the synthetic turf system caused by or connected with abuse, neglect, deliberate acts, act of God, casualty, static or dynamic loads exceeding Contractor's recommendations, footwear having cleats, spikes, or similar projections other than conventional baseball, football, soccer, or rugby shoes having cleats of not more than 1/2" in length, and other conventional running track shoes having spikes of not more than 1/4" in length, or use of improper cleaning methods.
- H. Contractor/Vendor shall be allowed to examine the synthetic turf system regarding any claim that the Owner makes to be present at any time, to analyze the results of all tests conducted by the Owner or others, and to conduct such tests of their own. Contractor shall not be responsible for any costs or expenses incurred by the Owner or others with respect to such tests, except the Contractor shall pay for costs of all tests and analysis conducted or directed by their representative.

- I. In the event the Contractor/Vendor does not respond to the Owner's written notice within 10 days of receipt of notice or does not submit, schedule and execute corrective work within 30 days for any material replacement and within 5 days for work limited to repairs of existing materials or repair that can be made with attic stock materials, the Owner has the option of having the work performed at the expense of the Contractor.
- J. Sample form of warranty herein set forth is a suggested form for use for the work under this section. Manufacturer's standard form of warranty may be used provided all conditions specified are incorporated. All claims by the Owner under this warranty must be made in writing to Contractor's address at _____ within 30 days after the Owner learns of the defect giving rise to the claim. This warranty shall constitute a contract made in the State of California and shall be governed by the laws thereof.

1.14 FORM OF WARRANTY FOR SUPPLEMENTAL PAD SYSTEM

- A. Contractor/Vendor hereby warrants to Owner, subject to the limitations and conditions set forth below, that field underlayment system consisting of _____, is free from defects in material and workmanship and shall, for a period of eight years from the date of acceptance by the Owner, remain serviceable for multiple sports and snow removal activities.
- B. Contractor/Vendor warrants to the Owner that its field underlayment materials shall remain permeable and shall not fail, shrink or buckle. Contractor shall, at their sole expense and cost, replace such areas of the field underlayment system not performing to these standards for the life of the warranty.
- C. Definitions
 - 1. The term "permeable" in the context of this warranty shall mean that the field underlayment material shall provide a minimum vertical drainage rate of 20 inches per hour.
 - 2. The term "not shrink" in the context of this warranty shall mean that the field underlayment panels shall remain butted together without gaps exceeding ¼ inch in any location across the field.
 - 3. The term "buckle" in the context of this warranty shall mean that the field underlayment shall lay flat on the base without warping or creating surface irregularities in excess of ¼ inch.
- D. Contractor/Vendor shall replace with new materials, at their sole expense, any field underlayment materials that do not comply with these warranty requirements.
- E. These warranties and the Contractor's/Vendor's obligations here-under are expressly conditioned upon;
 - 1. The Owner maintaining and properly caring for the synthetic turf and field underlayment system in accordance with the Contractor's/Vendor's maintenance manual and instructions;
 - 2. The Owner complying with the dynamic and static load specifications established by the Contractor/Vendor.
- F. The warranty is not to cover any defect, failure, damage caused by or connected with abuse, neglect, deliberate acts, act of God, casualty, static or dynamic loads exceeding Contractor's / Vendor's recommendations.
- G. Contractor/Vendor shall be allowed to examine the field underlayment system regarding any claim that the Owner makes to be present at any time, to analyze the results of all tests conducted by the Owner or others, and to conduct such tests of their own. Contractor/Vendor shall not be responsible for any costs or expenses incurred by the Owner or others with respect to such tests, except the Contractor/Vendor shall pay for costs of all tests and analysis conducted or approved by the Owner's Representative.
- H. In the event the Contractor/Vendor does not respond to the Owner's written notice within 10 days of receipt of notice or does not submit, schedule and execute corrective work within 30

days, the Owner has the option of having the work performed at the expense of the Contractor/Vendor.

- I. Sample form of warranty herein set forth is a suggested form for use for the work under this section. Manufacturer's standard form of warranty may be used provided all conditions specified are incorporated. All claims by the Owner under this warranty must be made in writing to Contractor's address at _____ within 30 days after the Owner learns of the defect giving rise to the claim. This warranty shall constitute a contract made in the State of California and shall be governed by the laws thereof.

1.15 WARRANTY TESTING

- A. The turf for the field shall be tested for dynamic cushioning ("G" Test) by an experienced independent testing laboratory acceptable to the Field Landscape Architect or Owner at the completion of the installation shortly prior to acceptance inspection by the Owner/Field Landscape Architect, at the anniversary date of the first year, second year, fourth year, sixth year, and 60 days prior to the anniversary date of the warranty expiration. If conditions of the Specifications and/or Warranty are not met, the Contractor/Vendor has the option of corrective work or replacement. In the event corrective work does not meet the requirements of the Specifications after a second attempt to bring the system within these limits, then the Contractor/Vendor shall to replace non-conforming areas or sections solely at the Owner's discretion and direction.
- B. Tests shall be performed in accordance with ASTM F-1936-10 and F355.
- C. Test locations as designated in F-1936-10, Paragraph 8.1. Included in the report shall be the measured depth of the infill material at all test locations.
- D. All costs for the stated testing shall be paid by the Synthetic Turf Surfacing Contractor.
- E. If the Contractor/Vendor does not have the tests performed within 10 days of specified times listed, the Owner has the option of ordering the testing work at the expense of the Synthetic Turf Surfacing Contractor/Vendor.

PART 2 - MATERIALS

2.1 GENERAL

- A. Infilled Synthetic Turf: The turf system shall be a vertical-draining permeable synthetic turf system. The turf system shall consist of a synthetic grass-like surface pile, which shall be tufted into a synthetic backing.
- B. All backing layers and coatings shall be firmly bonded together. Coating materials must be completely cured and bonded to the other backing layers. Synthetic turf panels or rolls that do not meet this requirement will be rejected.
- C. The entire system shall be resistant to weather, insects, rot, mildew, and fungus growth, and be non-allergenic and non-toxic. The entire system shall be constructed to maximize dimensional stability, to resist damage and normal wear and tear from its designated use, and to minimize ultraviolet degradation.
- D. All adhesives used in bonding the system together shall be resistant to moisture, bacterial and fungus attacks, and resistant to ultraviolet rays at any location upon installation.

2.2 DYNAMIC CUSHIONING REQUIREMENTS

- A. The dynamic cushioning of the system shall not exceed a maximum value of 130 G's per ASTM, F1936-10 snf ASTM, F355, procedure A at any location upon installation.

2.3 ADDITIVE ALTERNATE #1 - SUPPLEMENTAL PAD COMPOSITION

- A. The supplemental pad system shall be either an interlocking polypropylene panels or a paved in place elastic layer pad. The shock-absorbing pad shall become part of the base for the synthetic turf surfacing system where noted.
- B. Polypropylene Panels:
 - 1. The panels shall be interlocking with gaps that allow for thermal expansion and contraction but do not exceed 0.25 inches. The panels shall be designed and manufactured specifically for in-filled synthetic turf underlayment applications. The panels shall meet the following minimum requirements:

Size: 73.5 x 49 inches interlocking panels
 Area: Net coverage per panel 24.15+/- ft²
 Thickness: 1.0" (25mm) +/- .18" (2mm)
 Panel Weight: approximately 5.56 lbs / panel
 - 2. Company must demonstrate successful installations totaling a minimum of 5 million square feet of manufacturer's material.
 - 3. The panels shall provide the following minimum performance requirements:

Surface contact: 50% minimum with synthetic turf backing,
 Friction coefficient: movement of artificial turf over 50mm distance 8.92N maximum force ISO 8295
 Shock Absorption: 65% per EN 14808
 Vertical Deformation: less than 6 mm per EN14809
 Repeated impact compression resistance: 106psi, repeated load, 20,000 cycle's system test with infilled turf; not to exceed 3%
 Bacteria and Fungi resistance: Pass per ASTM G22-76/G21-96
 Water Quality: ESSM 105-d/1997 Pass
 Material must be 100% recyclable, recycling for energy through combustion is not acceptable. Manufacturer must demonstrate recycling process as part of the pre-approval process.
 - 4. Manufacturer Reference: Brock International Power Base YSR-25mm or pre-approved equal

Brock International
 2840 Wilderness Place
 Boulder, CO 80301
 Telephone: (303) 544-5800 Fax: (303) 544-1273
 - 5. Manufacturer Warranty: The interlocking polypropylene panels shall include a 25 year manufacturer's warranty.
- C. Polyurethane Elastic Layer Pad
 - 1. The shock-absorbing pad shall be a paved-in-place (in-situ) porous elastic layer and shall become part of the base for the system.
 - 2. The elastic layer shall be porous and shall resist the effects of adhesives, water, freeze-thaw, heavy loads associated with athletic fields, compression/deflection, rot, mold, mildew, bacteria, and air-borne pollution.
 - 3. Single Layer Installation: The paved-in-place (in-situ) elastic layer shall be installed in one lift to a minimum thickness of 25mm. The elastic layer shall contain only the following:

Components	% by Weight
Granulated SBR rubber (1-5mm)	43-47%
Clean-washed "bird's-eye" aggregate (3-6mm)	44-48%
Single component high quality polyurethane binder	6-8%

4. The exact material mix ratio may be altered to provide strength, shock attenuation (in conformance with the 120G limit specified herein) and to provide permeability as approved by the Field Landscape Architect. Successful bidder may submit an elastic layer formulation with minor modification for Field Landscape Architect's consideration and approval.

2.4 PERMEABILITY REQUIREMENTS OF THE SYNTHETIC TURF SYSTEM

- A. The system including the synthetic turf, infill materials and the supplemental pad shall drain vertically a minimum of 20 inches precipitation per hour without visible surface ponding.

2.5 SYNTHETIC TURF PILE SURFACE

- A. The pile surface shall provide good traction in all types of weather with the use of conventional "sneaker-type shoes" and composition, molded-sole athletic shoes.
- B. The pile surface shall be suitable for both temporary and permanent line markings using rubber-base paint where applicable.
- C. Pile surface shall be nominally uniform in length for all portions of the field. Synthetic turf panels or rolls with irregular pile heights or with "J hooked" fibers that extend more than 1/4 inch above the surrounding fibers will be rejected.

2.6 SYNTHETIC TURF FABRIC SURFACE

- A. The fabric surface shall be constructed and installed in minimum 15-foot widths with no longitudinal or transverse seams, except for head or tee seams at field boundaries and inlaid lines within a finished roll assembly. The seams shall be 15'-0" spacing.
- B. Rolls that do not lay evenly and with full dimension width will be rejected. No fitted pieces or relief cuts will be allowed to true alignment.
- C. The color shall be uniform with no visible deviations in shade permitted. Rolls that do not meet this requirement will be rejected.

2.7 SYNTHETIC TURF SYSTEM MATERIAL COMPONENTS

- A. Pile fibers shall resemble freshly-grown natural grass in appearance, texture and colors.
- B. Fabric backing for the in-filled synthetic turf systems can be loose laid and anchored at the perimeter of the fields as shown in the details or adhered to the base.
- C. No transverse or "head" seams will be permitted within the football field grid (160' width x 360' length).
- D. All panel seams shall be secured with either sewing or adhesive with a supplemental fabric. Sewn turf seams shall utilized a high strength polyester fiber cord or nylon. Adhered seams shall include a minimum 12" width seam backing with adhesive to extend the length of the seam.

2.8 SYNTHETIC TURF PERFORATIONS

- A. Synthetic turf with tufted fibers and a coated backing must include either perforations in the backing for vertical drainage, or the turf shall include a partially coated backing providing permeability without the use of perforations. Certified independent test results indicating a minimum drainage rate of 40 inches per hour for the permeable backing must be provided.
- B. Perforations in turf backing to be a minimum of 3/16" diameter clear opening and shall be spaced a maximum of 4" uniformly on-center.
- C. The turf shall be perforated with a minimum of 95% integrity over entire surface. Holes must be full diameter, completely through the underside of the turf backing with no material residue or fragmented fibers remaining.

- D. Field Landscape Architect shall approve the turf perforations prior to shipment, upon shipment onsite, or during on-site perforating operations as applicable.
- E. If the non-permeable backing material exceeds 12 inches in width it shall be perforated in accordance with paragraph 2.7 of this section. Perforations shall be drilled from the surface after the adhesive has set.

2.9 LINES AND MARKINGS

- A. A complete field lining, marking and field boundary system with team area limits, etc., shall be provided with the initial installation of the surfacing system. Layouts shall be accurately surveyed and marked prior to installation.
- B. All lines and field markings shall be tufted in or installed as synthetic turf inlays. Wherever possible, lines shall be tufted into the turf panels in lieu of inlays. All markings shall be uniform in color, providing a sharp contrast with the turf color, and shall have sharp and distinct edges. Markings shall be true and shall not vary more than 7/32" from specified width and location.
- C. Manufacturer shall guarantee the synthetic turf is adaptable to painted lines in the event painting is utilized in the future.
- D. For cemented seams, use supplemental backing material. The supplemental backing material shall bridge all inlaid lines and markings a minimum of 4 inches on each side of the seam. Supplemental backing material that is greater than 12 inches in width shall be perforated in accordance with paragraph 2.7 of this section. Perforations shall be drilled from the surface after the adhesive has set.

Combined Football/Soccer Field

Football:

- | | | |
|-----|---------------------------|---|
| 1. | Playing field boundaries: | 24" wide white line except between 25 yl, where the boundary shall be a 72" wide white panel |
| 2. | Goal line: | 8" wide white lines |
| 3. | Each 5-yard line: | 4" wide white lines |
| 4. | 50-yard line: | 4" wide white line framed in 4" wide yellow lines |
| 5. | Each 1-yard inbound line: | 4" x 2' white lines |
| 6. | Each 5-yard inbound line: | 4" x 6" white line (each side of yard line) |
| 7. | Each 1-yard marker: | 4" x 2' white line |
| 8. | 3-yard line: | 4" x 6' wide white line |
| 9. | Team box lines: | 4" wide red lines extending from the 20 yard line with a 6' width red panel between 20 yard lines |
| 10. | Number size: | 6' high x 4' wide |
| 11. | Number face: | 12" |
| 12. | Number arrows: | 6" high and 18" wide white turf |
| 13. | Number color: | White |
| 14. | Mid Field Logo: | Yellow, Red |
| 15. | End zone panels | Black |
| 16. | End zone letters: | Red with yellow border |

Soccer:

- | | | |
|----|-----------------------------|------------------------|
| 1. | Playing field boundaries: | 4" wide yellow lines |
| 2. | Mid-field line: | 4" wide yellow line |
| 3. | Goal and penalty boxes: | 4" wide yellow lines |
| 4. | Center circle & penalty arc | 4" wide yellow lines |
| 5. | Corner kick arc | 4" wide yellow lines |
| 6. | Corner kick hash marks | 4" wide x yellow lines |

- 7. Center spot: 9" diameter yellow dot

2.9 MINIMUM SPECIFICATIONS FOR SYNTHETIC TURF SYSTEM MATERIALS

- A. The minimum material will be verified and enforced and will be the basis for Owner's testing. Material that fails to meet these minimum specifications will be rejected. The material specifications in this section are minimums. The manufacturer of the synthetic turf fiber and fabric may elect to exceed these specifications to ensure compliance with all requirements and the warranty as specified in this section.
- B. Color of synthetic turf to be medium green as approved by Owner. Additional turf colors shall be as called for in Section 2.8 for lines and markings. The fiber used for the lines and markings shall be of the same composition as that used for the green areas.

<u>Item</u>	<u>ASTM</u>	<u>Property</u>	<u>Minimum Specifications</u>
A.	D418	Pile Weight (monofilament)	44 oz/sq yard
B.	D418	Primary Backing	8 oz/sq yard total
C.	D418	Back Coating	16 oz/sq yard
D.	D418	Total Weight	68 oz/sq yard
E.	D418	Pile Height	2.25"-2.375" (2.25" minimum)
F.	D1335	Tuft Bind (without infill)	8 lbs.
G.	D1682	Grab/Tear Strength	200 lbs.
H.	D2859	Pill Burn Test	Pass

2.10 MINIMUM TURF MATERIAL SPECIFICATIONS

- A. Turf pile fiber shall be monofilament fibers polyethylene athletic quality yarn designed specifically for outdoor use and stabilized to resist the effects of ultra-violet degradation, heat, wear, water and airborne pollution.
- B. Fiber shall be certified to have less than 50 ppm or less of lead from both the fiber supplier and the turf vendor.
- C. The monofilament fiber shall meet the following requirements:

<u>Item</u>	<u>ASTM</u>	<u>Property</u>	<u>Minimum Specifications</u>
1.	D1577	Yarn Denier / Ply	10800 / 6
2.	D1577	Base Filament Thickness	300 U Micron
3.	D1577	Monofilament Width	1.40 mm
4.	D2256	Yarn Breaking Strength	20 lbs
5.	D2256	Yarn Elongation to Break	50%
6.	D789	Yarn Melting Point	240° F.

- D. Fiber Wear Simulation: Fiber shall exhibit no splitting or appreciable degradation after a minimum of 20,000 cycles of simulated Lisport wear testing and shall remain serviceable without appreciable face weight loss after a minimum of 40,000 cycles of simulated Lisport wear testing.
- E. Fabric Composition: Shall consist of 100% polyethylene monofilament yarn tufted into polypropylene backings coated with high-grade polyurethane. Coating and backing materials shall assure suitable tuft bind strength, dimensional stability, and long-term wearing properties.

2.11 INFILL MATERIALS

- A. The synthetic turf shall utilize a combination of sand and rubber infill materials. The maximum sand content shall not exceed 30% by volume and shall not be less than 20% by volume.

Proprietary infill volumes with greater than 30% sand will be considered on a product by product basis. The exact in-fill material ratio may be altered to provide strength, shock attenuation, and to provide permeability by the vendor/installer as approved by the Field Landscape Architect, however the minimum sand by volume shall not be less than 20%.

- B. Infill material shall be applied in a dried condition when the turf is dry. It shall be applied in uniform layers effectively dragged and/or brushed to distribute the material uniformly onto the backing of the turf.
- C. The sand infill material shall be graded silica sand, sub-round to round, compaction resistant, washed and dried. The sand shall meet the following criteria:

Percent Silica	80-95%
Shape	Round to Sub-round
Sphericity	0.65 – 0.85
Roundness	0.60 – 0.70
Hardness (Moh)	7

The sand gradation shall meet the following wet sieve analysis:

<u>Sieve Size</u>	<u>Percent Retained</u>
#16	0% – 5%
#20	10% – 20%
#30	50% – 70%
#40	15% – 25%
#50	0% – 10%
#100	0% – 5%
Pan	0% – 2%

- D. Rubber Infill:
 - 1. The rubber shall be 100% SBR ambient or cryogenically processed free of any tire cord and steel materials or kevlar. SBR rubber shall be manufactured from North American automotive or truck tires and shall be generated from California based tires. Tires more than 10 years old from date of production are not allowed. The rubber infill material gradation shall meet the following size requirements:

2.0 – 1.5 mm	0% - 10%
1.5 – 1.0 mm	10% - 30%
1.0 – 0.5 mm	40% - 80%
0.5 – 0.0 mm	0% - 10%

- E. SBR rubber shall be certified in writing to have less than 50 ppm or less of lead from both the rubber supplier and the turf vendor.
- F. Infill material shall be applied in a dried condition when the turf is dry. It shall be applied in uniform layers effectively dragged to distribute the material uniformly to the backing of the turf.
- G. The application rate shall provide a total minimum weight of 3.0 lbs of rubber infill material per square foot of the turf area.
- H. Maximum exposed fiber height shall range from ¾” to ½” after infill placement, settling, and compaction, however in no instance shall exposed pile height conflict with any known patents.

2.12 PAINT

- A. Paint for lines and markings shall be specifically formulated for use with synthetic turf. Paint formulation shall be considered as a semi-permanent installation. Acceptable manufacturer

and product include:

1. Pioneer Athletics – ExtremeLine Paint
2. Or approved equal.

2.13 MAINTENANCE EQUIPMENT – SWEEPER UNITS

- A. The Contractor shall provide one tow behind sweeper/ provide ground driven rotary brush for the cleaning and maintenance of the infilled synthetic turf. Unit shall:
1. Provide for metered re-application of infill material with simultaneous dirt removal through 2 sieve trays
 2. Provide sieve trays with variable settings from 4-10MM;
 3. Adjustable depth row of tines for decompact infill material
 4. Working width to be nominally 6 ft.
 5. Rear mounted drag brush.
 6. Provide connections for tow behind standard tractor or utility vehicle.
- B. Manufacturer's Reference: The sweeper unit shall be SMG TurfCare TCA 2000 or approved equal. Contact SMG Equipment LLC, (253) 350-8803 / www.smgequipment.com.

2.14 MAINTENANCE EQUIPMENT – DRAG BRUSH UNITS

- A. One tow-behind drag unit shall be furnished to the Owner with the playfield surfacing system.
- B. The drag brush unit shall include 3-point hitch, rear-mount with tow coupling.
- C. Include four specially-arranged brush rows to level surface of turf with infilling granulate
- D. Working width to be nominally 5 ft.
- E. Manufacturer's Reference: The unit shall be SMG Turftuner TT1600 or approved equal. Contact SMG Equipment LLC, (253) 350-8803 / www.smgequipment.com.

2.15 ALTERNATE FIELD EQUIPMENT

- A. The synthetic turf vendor may request to substitute equipment for those specific units specified, provided an equivalent function is provided to the specified equipment.

PART 3 - INSTALLATION

3.1 CERTIFICATION OF FIELD BASE INSTALLATION

- A. The Contractor or the Contractor's subcontractor shall perform an inspection of the permeable aggregate and submit written certification of acceptance of the base for the installation of the synthetic turf system.
- B. Summary of certification shall include, but not be limited to:
1. Acceptance of the base construction "finish surfaces" as totally suitable for the application of work specified under this section.
 2. Verification and certification of the infiltration and permeability rates of the permeable aggregate as applying to the warranty.
- C. All discrepancies between the required materials, application and tolerance requirements noted by the turf installer shall be brought immediately to the attention of the Contractor and the Field Landscape Architect. Failure of the turf installer to immediately inform the Contractor and Field Landscape Architect of any prior work that does not meet the required specifications will result in the turf installer being required to perform any work needed to bring the base to acceptable condition.

3.2 ADDITIVE ALTERNATE #1: SUPPLEMENTAL PAD INSTALLATION

A. Polypropylene Panel Installation:

1. Acceptance of the base construction "finish surfaces" as totally suitable for the application of work specified under this section.
2. Use only new materials manufactured and shipped for the specific installation. No used, recycled or refurbished materials are to be installed. Manufacturer must provide documentation of material content and MSDS sheet for submittal package.
3. Product to be shipped as flat panels on prepackaged pallets. Pallets to be wrapped with heavy-duty barrier for protection from moisture and UV exposure.
4. Seams should be mechanically locked into place by hand without use of additional materials, glue, fasteners or secondary processes or equipment.
5. Material must be installed using manufacturers guidelines.
6. Manufacturer must provide written procedures to selected turf supplier for the installation of turf on top of underlayment.
7. Surplus materials to be determined by the Owner prior to order and delivery of product to the installation site. Surplus quantities to be identified in writing by the General Contractor at the time of order placement.
8. Upon completion of installation, a walk-through will be conducted to inspect the quality of work and ensure all details meet specifications.
9. Perform all work in strict accordance to the drawings, shop drawings and manufacturer's installations and instructions.

B. Elastic Layer Pad Installation

1. The Superintendent shall thoroughly inspect all materials delivered to site both for quality and quantity to assure that the entire installation shall have sufficient material to maintain proper mixing ratios.
2. Installation of the elastic layer shall not take place if the ambient temperature is below 50 degrees F, if the material is wet, or if rain is falling or pending.
3. The material to be placed shall be mechanically mixed to obtain a homogeneous mixture. Extreme care shall be taken under the immediate supervision of the Superintendent in the weighing and mixing of the components to maintain a uniform mixture with predicable and consistent performance characteristics across the entire field area. The polyurethane shall be of sufficient volume to obtain satisfactory long-term bonding of the components but shall not be of such volume as to render the elastic layer hard and uncomfortable for athletic use.
4. The elastic layer shall be installed with a paving machine that utilizes an electrically heated finish surface screed bar. The paving machine must be operated by a minimum of two skilled technicians at all times.
5. All seams shall be hand rolled and cold pad joints shall be primed with a polyurethane primer supplied by the binder manufacturer.
6. The Superintendent must consistently monitor thickness of the elastic layer and supervise all mixing ratios by means of component weight checks.
7. The elastic layer pad must cure free of foot and equipment traffic for 48 hours after placement.
8. The finished elastic layer must be properly compacted, uniform in texture, density, thickness, and tolerance to grade and suitable as a shock attenuation pad providing dynamic cushioning for the turf system.
9. The elastic layer shall have minimum thickness of 25 mm. The finished surface shall not vary more than 1/4" in 10' (6.25mm in 3.0 meters) measured in any direction as gauged from a string line or straight edge.
10. The Contractor shall test the permeability of the in-situ pad prior to synthetic turf installation. The pad shall be tested in a minimum of six (6) representative locations.

The test results shall be submitted to the Field Landscape Architect prior to synthetic turf installation.

3.3 SYNTHETIC TURF INSTALLATION

- A. Perform all work in strict accordance to the drawings, specifications, shop drawings and manufacturer's specifications and instructions.
- B. Verification: The Contractor is responsible for inspecting, verifying, and accepting all installed work of this section.
- C. Environmental Conditions: Do not apply adhesive materials or infill material when:
 - 1. Ambient air temperature is below 50 degrees F.
 - 2. Material temperatures are below 50 degrees F.
 - 3. Rain is falling or pending
 - 4. Conditions exist, or are pending, that will be unsuitable to the installation of the system.
- D. Preparation:
 - 1. Accept base onto which the synthetic turf surfacing system and the anchoring system are to be applied, as specified above.
 - 2. Immediately prior to application of the synthetic turf, the base shall be thoroughly cleaned of all foreign material, soil, or any other substances that may be detrimental to permeability and the installation of the turf system.

3.4 INSPECTION OF MATERIALS

- A. Prior to installation, and immediately upon delivery of synthetic turf system materials to the project site, the Synthetic Turf Surfacing Contractor shall inspect material as follows:
 - 1. For damaged or defective items;
 - 2. Measure turf pile height and thickness of each roll;
 - 3. Measure backing perforation diameter and spacing;
 - 4. Reject damaged materials and all materials out of tolerance with this specification.
- B. After installation, inspect project area for acceptable seaming, adhesive bonding, uniformity of color of turf, bubble- and wrinkle-free surface smoothness as laid, field lines and markings, insert installations, edge details. Remove and/or repair deficient workmanship in a manner consistent with these specifications prior to requesting the Field Landscape Architect's inspection pursuant to completion and acceptance of the work.

3.5 OWNER'S TEST

- A. Owner may have samples of the turf submitted and tested for verification of conformance to specifications. Turf system acceptance is subject to the results of these tests.
- B. Any material so tested and found not conforming to specification will be rejected and replaced with material conforming to the specification at Synthetic Turf Surfacing Contractor's expense. Re-submittal shall be required.

3.6 SYNTHETIC TURF INSTALLATION

- A. Perform all work in strict accordance to the drawings, shop drawings and manufacturer's specifications and instructions.
- B. Verification: The Contractor is responsible for inspecting, verifying, and accepting all installed work of this section.
- C. Environmental Conditions: Do not apply adhesive materials or infill material when:
 - 1. Ambient air temperature is below 40 degrees F.
 - 2. Material temperatures are below 40 degrees F.
 - 3. Rain is falling or pending
 - 4. Conditions exist, or are pending, that will be unsuitable to the installation of the system.

- D. Preparation:
1. Accept base onto which the synthetic turf surfacing system and the anchoring system are to be applied, as specified above.
 2. Immediately prior to application of the synthetic turf, the base shall be thoroughly cleaned of all foreign material, soil, or any other substances that may be detrimental to permeability and the installation of the turf system.
- E. Equipment and Access:
1. Passenger vehicles shall not be allowed to park or staged upon the completed aggregate surface either prior to or during installation of the synthetic turf.
 2. Equipment utilized during construction including compressors, generators, etc. shall be in complete working order, with exhaust systems oriented vertically and away from the synthetic turf surface. At any location where equipment is parked and/or staged on the turf surface during installation, adequate protection of the finish turf surface will be required including, but not limited to heat resistant panels to ensure 100% viability of the finish turf surface and fibers. Should a portion of the turf be damaged as a result of installation techniques, the entire turf panel may be subject to rejection and replacement at the direction of the Field Landscape Architect.
- F. The fabric surface shall be constructed and installed in 15 -foot minimum widths with no longitudinal or transverse seams, except for head or tee seams at field boundaries and inlaid lines within a finished roll assembly.
- G. Rolls that do not lay evenly and with full dimension width will be rejected. No fitted pieces will be allowed to true alignment.
- H. Bonding of Material Surfaces: The bonding or fastening of all system material components shall provide a permanent, tight, secure and hazard-free, athletic playing surface. System material components include:
1. Bonding all seams and inlaid line and markings
 2. Bonding and seaming must maintain their integrity for total length of warranty period.
- I. Seams:
1. All turf seams shall be either sewn with high strength polyester fiber cord or nylon or adhered to a supplemental backing material.
 2. Backing layers must lie flat on the field base to provide a uniform pile surface.
 3. The width between fiber rows at the seam locations shall not exceed that of the tufting gauge of the turf materials.
 4. All sewn seams shall be brushed to provide full coverage of fiber over the thread.
- J. Turf Edges: Turf edges to be as shown on the edge fastening detail and nailed at the perimeter.

3.7 LINING / MARKING INSTALLATION

- A. Complete field markings shall be provided with the initial installation of the surfacing system. Provide lines and markings in conformance with these specifications. Layouts shall be accurately surveyed and marked prior to installation.
- B. If overlapping backing materials are utilized for the inlaid lines and markings resulting in a non-permeable surface in excess of 12 inches wide, the backing materials shall be perforated in conformance with section 2.08 after gluing and prior to installation of the infill material.
- C. To the greatest extent practical, lines and markings shall be installed without compromising the primary backing.
- D. Painted lines and markings shall be crisp and distinct, with no weeping or overspray. Application of paint shall be exactly aligned with required dimensions and a guide wire/string line shall be used to produce straight lines.
- E. Contractor shall reapply paint if markings exhibit any appreciable fading or degradation within three months of initial application.

3.8 SYNTHETIC TURF EDGE ANCHOR INSTALLATION

- A. Anchor synthetic turf along the sides and ends with the existing edge nailer board as shown in the details. Complete any adjustments/additions to the turf nailer board to ensure the top of the infill meets and matches the top of the concrete or rubberized surface edge directly adjacent to the synthetic turf.

3.9 IN-FILL INSTALLATION

- A. The in-fill material shall be applied in a dry condition and when the synthetic turf is dry.
- B. The synthetic turf installer shall not infringe upon any current or pending patents held by other synthetic turf manufacturers or installers with the installation of the in-fill materials.
- C. The infill materials will be installed with a minimum of 12 applications.
- D. The infill installation shall not result in fiber material trapped below the surface of the infill material. If fiber is trapped below the surface, a portion or all of the infill material must be removed and reinstalled.
- E. The infill material shall be installed at a uniform depth across the entire field area. Infill depths shall not vary by more than +/- 5 mm from the design infill level indicated in the approved submittals across the entire synthetic turf surfacing area
- F. The in-fill materials shall be water settled to provide accelerated consolidation of the in-fill material prior to use by the Owner. Water is available from quick coupling valves located around the field, as well as the washwater/spray system. The Synthetic Turf Contractor shall utilize existing equipment to evenly apply a minimum of 1 inch of water over the entire field area for water settlement. Upon completion of the initial water settlement, the surface will be inspected the Owner and Field Landscape Architect for footing stability and in-fill consolidation. The Synthetic Turf Contractor shall provide any additional water settling as required by the Owner and Field Landscape Architect to achieve the desired level of in-fill stability and consolidation.

3.10 CLEANING

- A. Remove all excess materials of all types, equipment, debris, etc., from the site immediately after completion of the work. Remove all stains and other blemishes from all finished surfaces. Leave work in clean, new appearing condition, ready for use by Owner.
- B. The Contractor shall inspect the entire field area with a hand-held metal detector to identify any construction materials or tools left on the field. All such materials shall be removed prior to Owner occupancy of the field.

3.11 PROTECTION

- A. Adequate protection of materials and work from damage will be the responsibility of the installer during installation and until acceptance of their work. Synthetic Turf Surfacing Contractor will be responsible for protection after the acceptance of the work until final acceptance of all contract work by the Owner. All material damaged prior to acceptance by the Owner shall be replaced at no cost to the Owner.

3.12 EXTRA MATERIALS

- A. Deliver to Owner all extra materials herein specified. Receive Owner's written receipt for all materials. Deliver receipt to Field Landscape Architect.
- B. Infill Materials: Provide four (4) 33-gallon rubber trash containers with lids of each infill material used for each site.
- C. Turf for Future Repairs: Material may be roll-ends or cutoffs; however, each piece of fabric shall be at least 5' x 10'. At least one green piece shall be at least 10' x 15'. The following are minimum areas for the extra synthetic turf materials to be provided by the Synthetic Turf Surfacing Contractor to the Owner:

Minimum Quantities:

1.	Medium Green Turf:	1500 sf
2.	White Turf:	100 lf 4" lines
3.	Yellow Turf:	100 lf 4" lines
4.	Red Turf:	100 sf
5.	Red Turf	100 lf 4" lines
6.	Black Turf	500 sf
7.	White Turf	500 sf

- D. ADDITIVE ALTERNATE # - Supplemental Pad: If panelized system is utilized, provide 500 sf of new and unused pad for future Repairs.

3.13 MAINTENANCE EQUIPMENT

- A. Contractor shall uncrate, assemble and demonstrate operation of equipment to Owner and Owner's Representatives.
- B. Following assembly of equipment, Contractor shall complete a minimum four (4) hour training session utilizing the equipment with a variety of maintenance personnel from the College of the Redwoods staff.

3.14 MAINTENANCE

- A. Vendor shall complete maintenance of the synthetic turf field at both 6 months and 1 year after the date of Substantial Completion. Minimum maintenance activities shall include:
1. Inspect and repair as required each inlay and seam.
 2. Brush and remove surface debris, loose fibers and any other deleterious material. Use of a rotating, mechanical brush is recommended.
 3. Decompact and re-level infill materials. Import and place /top dress new infill material matching original infill materials as needed to establish original infill depth, with original installation height of exposed fiber.
- B. All maintenance activities shall be as approved and directed by the original manufacturer.
- C. All maintenance activities shall be coordinated with scheduled use of the facility and completed at the convenience of the owner and applicable user groups.

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SECTION 32 18 23.10 - RUBBERIZED TRACK SURFACING

PART 1 - GENERAL

1.1 SCOPE OF WORK

- A. Provide all necessary labor, materials, and equipment necessary for;
 - 1. Base Bid: Construction of new base matt structural spray type surfacing system at running track and field event areas including east "D" zone long/triple jump venue, east high jump area, and west "D" zone pole vault and steeplechase venues.
 - 2. ADDITIVE ALTERNATE #3: Addition of 2 component polyurethane sealer for a resulting sealed base matt structural spray surfacing system.
 - 3. The track surfacing contractor shall protect all adjacent areas and surfaces during Provide painted lines and striping as specified and in compliance with NCAA rules and regulations.
- C. Coordination and cooperation with all other trades performing work relating to and affecting the work of this section.
- D. Review of and acceptance of installed work of other trades directly affecting the work of this section including asphalt and concrete pavement base areas to receive the surfacing system. a
- E. The finish of all rubberized surfaces must be of a homogeneous texture. All areas, such as abutting seams, that do not have uniform texture must be cut out and resurfaced with acceptable texture and finish appearance.
- F. Warranty package.

1.2 RELATED WORK IN OTHER SECTIONS

03 30 53	Miscellaneous Cast in Place Concrete
32 12 16.36	Track Asphalt Paving
32 18 23	Synthetic Turf Surfacing

1.3 STANDARD SPECIFICATIONS

- A. World Athletics (formerly IAAF)
- B. NCAA Track & Field Rules (Latest edition)
- C. ASTM F 2157-09 Standard Specification for Synthetic Surfaced Running Tracks
- D. ASTM D2859-06(2012) Standard Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials.

1.4 PRE-APPROVED VENDORS/INSTALLERS

- A. Vendor for the rubberized field event surfacing shall be the same as the rubberized track surfacing. The following vendors/installers are pre-approved for installation of the rubberized running track and field event surfacing:
 - 1. Beynon Sport Surfacing (559) 237-2590
 - 2. Hellas Construction (512) 250-2910
 - 3. AstroTurf/Rekortan (800) 455-1620

1.5 SUBMITTALS

- A. Experience, References, and Installation:
 - 1. Vendors shall provide proof of World Athletics (formerly IAAF) Certification for all new, full-profile surfaces to be installed under the Contract.
 - 2. All vendors which are not pre-approved shall submit written evidence of a five-year minimum successful experience record of Manufacturer/Supplier/Installation team in the

- installation of a minimum of twenty (20) similar projects for NCAA track and field facilities that include poured-in-place, two-component elastomeric polyurethane synthetic track surfacing. List locations, client, client contact names, address, telephone, material installed, date of installation, general contractor (if any), whether a new project or a resurfacing.
3. The material manufacturer must have a minimum of 5 years of experience with compound two-part polyurethane for athletic surfaces. Track vendors/ installers with less than this minimum experience record are not acceptable.
- B. Striping:
1. A minimum of 30 calendar days prior to the scheduled commencement of the surfacing installation, the Contractor shall submit to the Engineer the name of track marking subcontracting firm and surveyor, their proposed foremen and key personnel, along with their experience record. The Engineer must approve the marking subcontractor.
- C. Track Striping Shop Drawings
1. The Contractor shall submit a minimum of 30 calendar days prior to the scheduled commencement of the surfacing installation, complete and detailed track striping and marking plan with calculations showing all conditions of installation, connection to other work, dimensions, size, shape, color, and location of all lines and markings, including hurdle markers, lane numbers, relay exchange zones, etc. Drawings shall show the entire track on one sheet at 1"=20' scale.
 2. This shop drawing is for Engineer review. The Contractor is not to proceed with painting until the drawing is approved by Engineer or, as may be required, resubmitted for approval with revisions.
- D. Manufacturer's Specifications: Within 7 calendar days after Notice of Award, the Contractor/Vendor shall submit to the Engineer for approval five copies of each of the selected manufacturer's surfacing material specifications and installation instructions.
- E. Sample Warranty Package: Within 21 calendar days after Notice to Proceed, submit to the Engineer for review five (5) sample copies of the surfacing warranty package herein specified.
- F. Maintenance and Operating Data:
1. Furnish to the Engineer, in manual form, four (4) copies of maintenance and operating data prior to final acceptance.
 2. Manual shall be enclosed in a hard cover with the following information appearing on the outside of the cover: Project name, Owner's name, Engineer's name, Rubberized Surfacing, Consultant's name, Prime Contractor's name, Year of project completion
 3. Index manual with tab dividers for data as follows:
 - a. Materials installed with their characteristics
 - b. General maintenance
 - c. Lining and marking installation
 - d. Lining and marking removal
 - e. Small repair procedures
 - f. Discussion on precautions to be practiced and general maintenance and procedures to be avoided to prolong surface life and to maintain installation's warranty.
 - g. Snow removal procedures
 - h. Copy of warranty document

1.6 QUALITY CONTROL

- A. Area and Base Acceptance:
1. The Contractor/Surfacing Subcontractor/Installer (as applicable) shall inspect, verify and accept in writing to the Engineer, all installed work of other trades directly affecting the work of this section and prepare existing surfaces.
 2. Installer must examine the areas and conditions in which rubberized surfacing is to be installed. The asphaltic concrete or concrete paved base shall be inspected for conformity with the lines and grades.

3. The installer is to coordinate the required curing of any new asphalt concrete paving with the Prime Contractor prior to placing the first lift of rubberized surfacing.

B. Track Marking Certification

1. Upon completion of the track markings, the Contractor shall furnish an acceptable document or certificate of accuracy to the Owner attesting to the accuracy of the track markings and measurements and shall include copies of the computations, calculations, and drawings that were used to obtain this accuracy.

1.7 TESTS

- A. The Owner reserves the right to submit the surface system to various tests to verify whether or not surfacing system meets the minimum specifications or manufacturer's submitted specifications. Any section of the system so tested that is found to be out of specification shall be removed and replaced to the proper specification, at the sole expense of the Contractor.

1.8 WARRANTY

- A. In addition to the general warranty specified in the General Conditions of the specifications, an additional four-year vendor warranty (5-year total) for the rubberized surfacing system shall be provided to the Owner by the track surfacing vendor, protecting Owner against all manufacturing, material and installation defects associated with materials and workmanship under this section. Warranty to extend from date of final acceptance by Owner.
- B. Warranty shall cover in general the usability of the installed surfacing system, accessories use characteristics, suitability of the installation for the period specified, and for the designated uses enumerated as follows:
1. Track and field events with spiked shoes
 2. Physical exercises
 3. Physical education activities
 4. Marching band
 5. Cheerleading activities
 6. Pneumatic rubber-tired maintenance and service vehicles
 7. Pedestrian traffic and other similar uses
 8. Community running and jogging
 9. Wheelchair traffic
- C. Conditions of the Warranty: Warranty shall agree to promptly repair or replace work, which deteriorates excessively or otherwise fails to perform as required due to failures of materials and workmanship. Striping and other painted markings are excluded from the warranty. For the purposes of this warranty, excessive deterioration is defined as a loss of fifty (50%) of the wearing surface or granular loss. Failure of material and workmanship is defined to include, but is not limited to, delaminating of the track from its asphaltic concrete base, or from integral layers of surfacing material, and leaching of binders or other surfacing components. All defects are to be promptly repaired. If the warrantor does not initiate repair work within 21 calendar days from receipt of complaint in writing, adverse weather conditions accepted, the Owner shall have the right to order the work performed by others and the warrantor shall be liable for costs accruing to the Owner.
- D. The parent company or corporation of the track surface installation firm shall issue the warranty. The warranty shall be signed by an authorized principal of the applicable firm, duly-authorized to make contracts.
- E. A separate warranty from the General Contractor, the Track Installer and/or the Striping Subcontractor shall be issued for the marking and striping guaranteeing applied painting for a period of two (2) years from fading in color and intensity plus cracking or separating from the track surface.

PART 2 - PRODUCTS

2.1 BASE MATT COMPOSITION

- A. A primer shall be applied to the asphalt or concrete pavement base prior to installation of the base matt. The primer shall be polyurethane base as specified by the surfacing system manufacturer.
- B. The base matt shall be composed of SBR rubber granules and single component polyurethane binder. The base matt shall be comprised of a maximum of 80% SBR and a minimum of 20% single component polyurethane by weight.
- C. The base matt layer shall be a minimum of 10 mm thick.
- D. SBR Rubber Granules:
 - 1. The granules shall be recycled styrene butadiene rubber (SBR). There shall be no traces of fiber or steel with granulate.
 - 2. SBR shall be sourced from North America.
 - 3. Granulate particles shall meet the following gradation requirements:

Particle Size	Percentage by Weight
0-1.0mm	3.5%
1.0-2.0mm	15-25%
2.0-3.0mm	30-40%
3.0-4.0mm	30-40%
Larger than 4.0mm	0-5%

- E. Polyurethane Binder:
 - 1. For the base layer utilize single component polyurethane.
 - 2. No mercury, lead or other heavy metals are to be present.
 - 3. No solvent or fillers are to be added.
 - 4. The polyurethane binder shall be manufactured in North American or Western Europe by a manufacturer that meets the experience requirements listed in subsection 1 of this section. The polyurethane manufacturer shall provide proof of World Athletics (formerly IAAF) Certification for all new, full-profile surfaces to be installed under the Contract.

2.2 ADDITIVE ALTERNATE #3 - BASE MATT SEALANT: The base layer shall be sealed with two-component self leveling polyurethane or a combination of two-component self leveling polyurethane and fine mesh EPDM rubber. Sealant polyurethane and EPDM shall be pigmented red.

- A. The two-component polyurethane shall be self-leveling and compounded from pigmented polyol and MDI based isocyanate with no solvents or fillers added.
- B. The two-component polyurethane shall be manufactured in North American or Western Europe by a manufacturer that meets the experience requirements listed in subsection 1 of this section. The polyurethane manufacturer shall provide proof of World Athletics (formerly IAAF) Certification for all new, full-profile surfaces to be installed under the Contract.
- C. EPDM:
 - 1. The granules may include shall be composed of fine mesh peroxide cured Ethylene Propylene Dien Polymerisat (EPDM) rubber.
 - 2. Granules shall have a specific density of 1.6 +/- 0.08.
 - 3. Materials to have shore hardness from 55 to 60.
 - 4. Sulphur cured rubber is unacceptable.
 - 5. EPDM Granulate shall be Melos GmbH, Gezolan Ag, or approved equal.

2.3 TRACK & FIELD EVENT SURFACING STRUCTURAL SPRAY SYSTEM TOP COAT

- A. The top coat shall be comprised of two structural spray coats. The structural spray coats shall be comprised of a blend of pigmented EPDM rubber granules and water based pigmented

single component polyurethane. The two structural spray coats shall be applied at a rate totaling 3.0 lbs/sy and providing a minimum 1.5 mm thickness for all areas.

- B. The binder for the structural spray coats shall be a single component water based pigmented polyurethane. No mercury, lead or other heavy metals are to be present. No solvent or fillers are to be added. The polyurethane shall be manufactured in North American or Western Europe by a manufacturer.
- C. The granulate for the structural spray shall be composed of peroxide cured Ethylene Propylene Dien Polymerisat (EPDM) rubber. For the first structural spray coat half of the granules are to be graded from 0.5 mm to 1.5 mm in size. For the second structural spray coat all of the granules are to be graded from 0.5 mm to 1.5 mm in size. The EPDM granules shall meet the following requirements:
 - 1. The granules shall be composed of peroxide cured Ethylene Propylene Dien Polymerisat (EPDM) rubber.
 - 2. Materials to have shore hardness from 55 to 60.
 - 3. Granules shall have a specific density of 1.6 +/- 0.08.
 - 4. Sulphur cured rubber is unacceptable.
 - 5. EPDM Granulate shall be Melos GmbH, Gezolan Ag, or approved equal.
 - 6. The structural spray coat EPDM rubber granules and single component polyurethane shall be pigmented red.

2.4 PHYSICAL PROPERTIES OF SYSTEM

- A. The synthetic track surfacing system shall exhibit the following minimum performance standards as required by World Athletics (formerly IAAF):

Thickness	> 13mm
Force Reduction	35 to 50%
Modified Vertical Deformation	0.6 to 1.8mm
Friction	> 47 TRRL Skid Resistance
Tensile Strength	> 0.5MPa
Elongation at Break	> 40%

- B. The synthetic track surfacing system shall exhibit the following minimum performance standards per ASTM:

Tensile Strength (D-412-61T)	300psi
Impact Resilience (D-2632)	0%
Compression Set (D-395-b)	90% - 95%
Compression Modulus (D-575-49):	10% and 50% 8kp/90kp
Gliding Behavior	Wet 0% - Dry 0%
Resistance to oil and normal cleaning solutions	Favorable

- C. The entire synthetic track surfacing system shall meet the acceptance criteria of ASTM D 2859-06(12), in which the ignition source/flame shall self-extinguish without igniting the track surfacing or reaching the test ring.

2.5 TRACK LINING AND MARKING

- A. The Contractor shall retain a Professional Engineer or surveyor licensed in the State of California to layout the track markings. Calculate locations of specified event markings. The calculations shall be made to the nearest 1/10,000th of a foot and angles to the nearest second.
- B. A complete track lining and marking system shall be provided in accordance with current NCAA and World Athletics (formerly IAAF) requirements.

- C. All lines and markings are to have true sharp edges with no weeping.
- D. Provide event striping layout in accordance with NCAA Rules (and referenced World Athletics (formerly IAAF) rules and requirements). Upon completion of the track rail and markings, the track surfacing contractor shall furnish an acceptable document or certificate of accuracy to the Owner attesting to the accuracy of the track curb/rail, markings and measurements as specified in 1.05 B of this specification section.
- E. Marking Paint: The paint shall be polyethylene based, specifically manufactured to be compatible with and formulated for application on polyurethane synthetic track surfaces.
- F. Markings shall include:
 - 1. Provide all necessary markings to comply with NCAA Rule 4, Section 4, Article 4.
 - 2. Relay Exchange Zones: Colors as recommended by NCAA
 - 3. Sprint events shall be included on each straight, including dash and hurdle events.
 - 4. Lane Numbers: Five sets of lane numbers "1" through "8", inclusive, with shadowing as approved by the Engineer. Lane numbers shall be not less than 3" stroke and not less than 24" high.
 - 5. Lane lines shall be white.
 - 6. A black 2" x 2" square shall be painted at the intersection of the common finish line at each lane line
 - 7. Long Jump Runway shall be marked at 5 ft. intervals, beginning at the edge of the pit/vault to the end of each runway. Markings shall consist of a 2" equilateral triangle, with a distance from the point of beginning.
 - 8. Pole Vault Runway markings shall consist of a 1" x 2" rectangle for the 1 ft. markings and a 2" equilateral triangle for the 5 ft. markings, with distance from the point of beginning indicated every 10 ft. Additional markings/gradations shall be included at the center of the runway, approaching the vault box and take off area.
 - 9. Lettering indicating a minimum "COLLEGE OF THE REDWOODS" to be painted centered on the home grandstand side (south) of the track in lane 5. Color of lettering and associated shadow to be determined. Font to be determined by the College and stencils utilized for painting shall be provide to the College at the completion of painting.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Accept the conventional asphaltic concrete or concrete base onto which the surfacing is to be applied.
- B. Immediately prior to application, all base construction shall be thoroughly cleaned of all dirt, debris or any other substances that will be detrimental to the installation.
- C. Apply such priming material as may be necessary to assure complete bond of polyurethane to the asphaltic concrete, and concrete base surfaces.
- D. Contractor must protect all adjacent areas from any contamination from rubberized surfacing installation procedures. Affix plastic sheeting to adjacent fences and pavements as necessary.

3.2 INSTALLATION

- A. General:
 - 1. Only experienced, specialized personnel are to be utilized in the installation of surfacing materials and applying the line and marking points. The Superintendent and the supervisory or technical personnel must be employees of the vendor/installer firm.
 - 2. Install in strict accordance with the specifications, drawings, approved shop drawings and manufacturer's specifications and instructions, when applicable.
- B. Environmental Conditions: Materials are not to be placed when:
 - 1. Ambient air temperature is below 50 degrees F.
 - 2. Material temperatures are below 50 degrees F.
 - 3. Surfaces are wet or damp.

4. Precipitation is falling or pending.
 5. Conditions exist or are pending that will be unsuitable for the installation of the system.
- C. Equipment: The components shall be blended in a clean and dry, specifically designed, mixing machine with automatic proportioning controls to guarantee exact proportions of the polyols and isocyanates and the auxiliary components (rubber) which control the reactions and balance of the varying climatic conditions during the laying process.
- D. Base Matt Installation:
1. The base layer shall be mechanically mixed to obtain a homogeneous mixture of 20% polyurethane and 80% SBR rubber granulate.
 2. Base material to be placed utilizing a mechanically operated finisher with an electrically heated, oscillating finishing screed bar.
 3. The base layer shall be placed with a minimum finished thickness of 8.0 mm as applicable.
- E. ADDITIVE ALTERNATE #3 - Base Matt Seal Coat Installation:
1. The base layer for all areas shall be sealed with a two-component self-leveling polyurethane. Material shall be flow applied at the rate of 2.4 lbs./SY and may be mixed with up to .8lbs / SY of fine mesh EPDM. If fine mesh EPDM is not added, an application rate of 3.0 lbs./SY is required.
 2. The two-component polyurethane shall be homogeneously mixed in accordance with the manufacturer's recommendations.
 3. The material shall be uniformly applied over the entire surface with sufficient amounts to seal the base matt resulting in an impervious surface.
- F. Structural Spray Coat Installation
1. Contractor must protect all adjacent areas from any contamination or over spray from rubberized surfacing installation procedures. Tape plastic sheeting to edging or adjacent exposed paving to protect synthetic turf and adjacent areas.
 2. The structural spray coat top layer shall be mechanically mixed to obtain a pigmented homogeneous mixture of 40% EPDM rubber and 60% urethane. The top layer shall be applied in two uniform applications of a minimum thickness of 1.50 mm.

3.3 FINISH

- A. The finished rubberized track and field event surfacing shall not vary more than +3.0mm and - 0.0 mm in 3 meters, measured in any direction as gauged from a straight edge. No reverse slopes or depressions will be allowed. The completed surface of the track and field events shall be of uniform texture and grade, and be free from defects of any kind.
- B. Contractor must protect all adjacent areas from any contamination from track installation procedures. Discoloring of any surfaces will be cause for required replacement if cleaning is deemed unacceptable by the Engineer.

3.4 LINING AND MARKINGS

- A. Surfaces must be completely dry before and during paint application. Temperature must not be below 50°F when painting.
- B. Lines to be applied to sides of runways.
- C. All lines and markings to have true sharp edges with no weeping.
- D. Marking and striping plan to be submitted for approval prior to start of painting. Minor adjustments to marking shall be directed by Engineer/Owner prior to starting.
- E. Event Markings: Provide layouts in accordance with NCAA and World Athletics (formerly IAAF).

3.5 CLEANING

- A. Remove all excess materials of all kinds, equipment, and debris from the site immediately after completion of the work.
- B. Remove all paint splatters, spots, stains, and other blemishes from all finished surfaces.

- C. Rubberized surfaces must have a new, uniform appearance.
Leave work in clean condition ready for use by the Owner.

3.6 PROTECTION

- A. Adequate protection of damage from materials and work will be the responsibility of the Contractor during installation and until acceptance of this work. The use of the field and track areas shall be closed by the contractor and restricted from use by all users not authorized to enter the site until turnover of the track surface has been achieved. The Contractor will be responsible for protection of the synthetic turf field and rubberized track and field events until after the completion of the work and final acceptance of all contract work.
- B. All damaged material prior to, during and after installation shall be replaced at no cost to the Owner.

END OF SECTION 32 18 23.10
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SECTION 32 18 23.20 - FIELD IMPORTED SANDS

PART 1 - GENERAL

1.1 SCOPE OF WORK

- A. Furnish and install jump pit sand in long jump landing areas.

1.2 SUBMITTALS

- A. The Contractor shall submit sieve analysis for the jump pit sand materials.

1.3 RELATED WORK IN OTHER SECTIONS

- A. 11 68 24 Exterior Athletic Equipment
- B. 31 22 16.23 Field Subgrade Establishment
- C. 33 46 16.13 Field Subsurface Drainage

1.4 TESTING

- A. The Owner will be performing testing of materials delivered to the job site for the purpose of verifying compliance with the contract documents. The Owner's testing is for this purpose only and not for construction quality control by the Contractor.
- B. The Contractor shall provide testing and surveillance as required to assure materials and work fully comply with contract requirements.
- C. Owner's tests that do not meet specifications shall be paid for by the Contractor at a price equal to the Owner's contract testing agreement. The Contractor shall pay directly to testing organization upon invoice which has been approved by the Engineer.

PART 2 - MATERIALS

2.1 JUMP PIT SAND

- A. The material shall be clean, natural sand, dry, conforming to ASTM "Fine Aggregate". The sand shall meet the following gradation:

<u>Sieve Size</u>	<u>% Passing</u>
No. 4	100
No. 10	100
No. 18	90-100
No. 35	45-55
No. 60	5-8
No. 100	0 – 3
No 150	0-2
No. 270 (wet sieve)	0 – 1

- B. Quality Standard shall be Gillibrand "ProTour" (805) 526-2195.

PART 3 - EXECUTION

3.1 AGGREGATE PLACEMENT

- A. Grade and establish drainage aggregate to a tolerance of +0.00' and -0.10'.
- B. Extreme care shall be taken so as not to not damage existing drainage, irrigation or potable water lines.
- C. After material is in place, apply 1" of water uniformly over entire surface and box drag to achieve a true surface.
- D. Surface grade tolerance of base course is +0.00' and -0.10'.

3.2 JUMP PIT SAND PLACEMENT

- A. Place materials so as to establish a minimum of finish settled depth, as specified on the drawings, and fine grade entire surface to final elevations shown; water settle and roll to achieve consolidated settled depth. Add material as necessary to achieve finish grade. Protect the concrete curbing and adjacent surfaces during the sand installation.
- B. Apply moisture as necessary to settle for stabilization.
- C. Finish grade tolerance is +0.10' and -0.00' to grading plan. Constant relative surface slope is to be maintained where indicated.

3.3 TOLERANCES

- A. The Contractor shall utilize a laser plane system for grade control.
- B. The surface of the base to be covered with decomposed granite as applicable shall not deviate from designated compacted grade within the range of -0.50" and +0.00".
- C. Upon completion of the fine grading, compaction, and Contractor confirmation of conformance with the tolerances, the Contractor shall notify the Field Landscape Architect and schedule an inspection for approval. The Contractor shall have a laser plane system available to the Field Landscape Architect for the inspections. The Contractor shall not be authorized to place finish surface materials turf over the base until it has been inspected and approved by the Field Landscape Architect.
- D. The surface of the decomposed granite as applicable shall not deviate from designated compacted grade within the range of -0.25" and +0.00".
- E. Upon completion of the fine grading of finish materials and Contractor confirmation of conformance with the tolerances, the Contractor shall notify the Field Landscape Architect and schedule an inspection for approval.
- F. Upon completion of final surfaces and contractor completion of elevation verification, the entire decomposed granite surface shall be inspected for planarity. Inspection shall consist of stretching a string line taut over the finished surface at such interval as may be required to confirm surface planarity and acceptance. Any deviation greater than 1/4" shall require remediation efforts as may be required to meet finish grade tolerance.

END OF SECTION 32 18 23.20
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SECTION 31 23 17 – TRENCHING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Excavating trenches for utilities from 5 feet outside building to utility service.
2. Compacted fill from top of utility bedding to subgrade elevations.
3. Backfilling and compaction.

B. Related Sections:

1. Section 31 05 13 - Soils for Earthwork: Subsoil materials.
2. Section 31 05 16 - Aggregates for Earthwork: Aggregates for fill.
3. Section 31 23 16 - Excavation: General building excavation.
4. Section 31 23 18 - Rock Removal: Removal of rock during excavating.
5. Section 31 23 23 - Fill: General backfilling.
6. Section 31 37 00 - Riprap.
7. Section 33 11 16 - Site Water Utility Distribution Piping: Water piping and bedding from building to utility service.
8. Section 33 46 00 - Subdrainage: filter aggregate.

1.2 REFERENCES

A. American Association of State Highway and Transportation Officials:

1. AASHTO T180 - Standard Specification for Moisture-Density Relations of Soils Using a 10-lb Rammer and a 18-in. Drop.

B. ASTM International:

1. ASTM D698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³).
2. ASTM D1556 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.
3. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³).
4. ASTM D2167 - Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.
5. ASTM D6938 - Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).

1.3 QUALITY ASSURANCE

- A. Perform Work in accordance with Caltrans Standard Plans.

1.4 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication.

1.5 COORDINATION

- A. Coordinate with owner and all underground utility providers prior to starting work.

- B. Verify Work associated with lower elevation utilities is complete before placing higher elevation utilities.

PART 2 – PRODUCTS

2.1 FILL MATERIALS

- A. Select Fill: Select Fill as specified in Section 31 05 13.
- B. Structural Fill: Coarse Aggregate Base as specified in Section 31 05 16.
- C. Granular Fill: Coarse Aggregate Subbase as specified in Section 31 05 16.

PART 3 - EXECUTION

3.1 LINES AND GRADES

- A. Lay pipes to lines and grades indicated on Drawings.
- B. Engineer reserves right to make changes in lines, grades, and depths of utilities when changes are required for Project conditions.
- C. Use laser-beam instrument with qualified operator to establish lines and grades.

3.2 PREPARATION

- A. Notify affected utility companies not less than three working days before performing Work.
- B. Request underground utilities to be located and marked within and surrounding construction areas.
- C. Identify required lines, levels, contours, and datum locations.
- D. Protect plant life, lawns, and other features remaining as portion of final landscaping.
- E. Protect bench marks, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.
- F. Maintain and protect above and below grade utilities indicated to remain.
- G. Establish temporary traffic control when trenching is performed in public right-of-way. Relocate controls as required during progress of Work.

3.3 TRENCHING

- A. Excavate subsoil required for utilities to utility service.
- B. Remove lumped subsoil, boulders, and rocks
- C. Perform excavation within 24 inches of existing utility service in accordance with utility's requirements.
- D. Do not advance open trench more than 200 feet ahead of installed pipe. Access to all open trenches to be controlled by contractor. Open trenches shall be covered with plates when not directly monitored.
- E. Cut trenches sufficiently wide to enable installation and allow inspection. Remove water or materials that interfere with Work.
- F. Excavate trenches to depth indicated on Drawings. Provide uniform and continuous bearing and support for bedding material and pipe.
- G. Do not interfere with 45 degree bearing splay of foundations.
- H. When Project conditions permit, slope side walls of excavation starting 2 feet above top of pipe. When side walls cannot be sloped, provide sheeting and shoring to protect excavation as specified in this section. Provide shoring as required by OSHA.
- I. When subsurface materials at bottom of trench are loose or soft, excavate to greater depth as directed by Engineer until suitable material is encountered.

- J. Cut out soft areas of subgrade not capable of compaction in place. Backfill with course aggregate and compact to density equal to or greater than requirements for subsequent backfill material.
- K. Trim excavation. Hand trim for bell and spigot pipe joints. Remove loose matter.
- L. Correct areas over excavated areas with compacted backfill as specified for authorized excavation or replace with fill concrete as directed by Engineer.
- M. Remove excess subsoil not intended for reuse, from site.
- N. Stockpile subsoil in area designated on site to depth not exceeding 8 feet and protect from erosion.

3.4 SHEETING AND SHORING

- A. Sheet, shore, and brace excavations to prevent danger to persons, structures and adjacent properties and to prevent caving, erosion, and loss of surrounding subsoil.
- B. Support trenches more than 5 feet deep excavated through unstable, loose, or soft material. Provide sheeting, shoring, bracing, or other protection to maintain stability of excavation.
- C. Repair damage caused by failure of the sheeting, shoring, or bracing and for settlement of filled excavations or adjacent soil.

3.5 BACKFILLING

- A. Backfill trenches to contours and elevations with fill materials.
- B. Systematically backfill to allow maximum time for natural settlement. Do not backfill over porous, wet, or spongy subgrade surfaces.
- C. Place fill material in continuous layers and compact.
- D. Place material in continuous layers as follows:
- E. Structural Fill: Coarse Aggregate Base, maximum 6 inches loose depth.
- F. Granular Fill: Coarse Aggregate Subbase, maximum 6 inches loose depth.
- G. Employ placement method that does not disturb or damage, utilities in trench.
- H. Maintain optimum moisture content of fill materials to attain required compaction density.
- I. Do not leave more than 50 feet of trench open at end of working day. Any trenches left open at the end of the working day are to be covered by plates.
- J. Protect open trench to prevent danger to the public.

3.6 TOLERANCES

- A. Top Surface of Backfilling Under Paved Areas: Plus or minus ½ inch (0.04 feet) from required elevations.
- B. Top Surface of General Backfilling: Plus or minus 1 inch from required elevations.

3.7 FIELD QUALITY CONTROL

- A. Quality Requirements: Field inspecting, testing, adjusting, and balancing.
- B. Perform laboratory material tests in accordance with ASTM D698.
- C. Perform in place compaction tests in accordance with the following:
- D. Density Tests: ASTM D1556, or ASTM D6938.
- E. Moisture Tests: ASTM D6938.
- F. When tests indicate Work does not meet specified requirements, remove Work, replace, compact, and retest.
- G. Frequency of Tests: Minimum of one test in each 1-foot of backfill, for every 200 feet of trench.

3.8 PROTECTION OF FINISHED WORK

- A. Execution and Closeout Requirements: Protecting finished work.
- B. Reshape and re-compact fills subjected to vehicular traffic during construction.

TBP/ ARCHITECTURE

STADIUM UPGRADE PROJECT
COLLEGE OF THE REDWOODS
BID SET

END OF SECTION

TRENCHING
32 23 17 - 4

SECTION 32 31 13 - CHAIN LINK FENCES AND GATES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Fence framework, fabric, and accessories.
 - 2. Excavation for post bases.
 - 3. Concrete foundation for posts.
 - 4. Manual gates and related hardware.

- B. Unless otherwise noted, the Contractor shall provide all materials, equipment, and labor necessary to produce finished Work as shown on the Drawings and as specified herein.

1.2 REFERENCES

- A. ASTM International:
 - 1. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
 - 2. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
 - 3. ASTM A392 - Standard Specification for Zinc-Coated Steel Chain-Link Fence Fabric.
 - 4. A1011/A1011M-07 Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength
 - 5. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete.
 - 6. ASTM F552 - Standard Terminology relating to Chain Link Fencing.
 - 7. ASTM F567 - Standard Practice for Installation of Chain-Link Fence.
 - 8. ASTM F626 - Standard Specification for Fence Fittings.
 - 9. ASTM F1043 - Standard Specification for Strength and Protective Coatings on Metal Industrial Chain Link Fence Framework.
 - 10. ASTM F1083 - Standard Specification for Pipe, Steel, Hot-Dipped Zinc-Coated (Galvanized) Welded, for Fence Structures.
 - 11. ASTM F1184 - Standard Specification for Industrial and Commercial Horizontal Slide Gates.

- B. Chain Link Fence Manufacturers Institute:
 - 1. CLFMI - Product Manual.

1.3 SYSTEM DESCRIPTION

- A. Fence Height: 8 feet nominal or as indicated on Drawings.
- B. Line Post Spacing: At intervals not exceeding 8 feet or as indicated on drawings
- C. Fence Post and Rail Strength: Conform to ASTM F1043 Heavy Industrial Fence quality.

1.4 DESIGN REQUIREMENTS

- A. Design wind loads:
 - 1. Wind speed; V = 100 mph.
 - 2. Exposure; D.
 - 3. Importance Factors; I = 1.0.

1.5 SUBMITTALS

- A. Shop Drawings: Indicate plan layout, spacing and size of components, post foundation dimensions, hardware anchorage, gates, and schedule of components.
- B. Product Data: Submit data on fabric, posts, accessories, fittings and hardware.

1.6 CLOSEOUT SUBMITTALS

- A. Project Record Documents: Accurately record actual locations of property perimeter posts relative to property lines.
- B. Operation and Maintenance Data: Procedures for submittals.

1.7 QUALITY ASSURANCE

- A. Supply material in accordance with CLFMI - Product Manual.
- B. Perform installation in accordance with ASTM F567.

1.8 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three years experience.
- B. Installer: Company specializing in performing work of this section with minimum five years documented experience.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Deliver fence fabric and accessories in packed cartons or firmly tied rolls.
- B. Identify each package with manufacturer's name.
- C. Store fence fabric and accessories in secure and dry place.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Framing (Steel): ASTM F1083 Schedule 40 galvanized steel pipe, welded construction, minimum yield strength of 25 ksi; coating conforming to ASTM F1043 Type A on pipe exterior and interior.
- B. Fabric Wire (Steel): ASTM A392 Class 2 zinc coated steel wire.
- C. Barbed Wire (Steel): ASTM A121 Coating Type Z, galvanized steel; 12 gage thick wire, 2 strands, 4 points at 3 inch oc.
- D. Concrete: Type specified in Section 03 30 00.

2.2 COMPONENTS

- A. Line Posts: As specified on plans.
- B. Corner and Terminal Posts: As specified on plans.
- C. Gate Posts: As specified on plans.
- D. Top and Brace Rail: As specified on plans.
- E. Gate Frame: As specified on plans.
- F. Tension Wire: 6 gage thick steel, single strand, marcelled, spiraled or crimped, aluminum-coated tension wire conforming to ASTM A824.
- G. Tie Wire: Aluminum alloy steel wire.

2.3 ACCESSORIES

- A. Caps: Galvanized pressed steel; sized to post diameter, set screw retainer.
- B. Fittings: Sleeves, bands, clips, rail ends, tension bars, fasteners and fittings; galvanized steel.
- C. Gate Hardware: Fork latch; 180 degree gate hinges for each leaf and hardware for padlock.
- D. Signage: Placards that inform the general public to keep out.

2.4 GATES

- A. General:
 - 1. Gate Types, Opening Widths and Directions of Operation: As indicated on Plans.
 - 2. Factory assembled gates.
 - 3. Design gates for operation by one person.
- B. Swing Gates:
 - 1. Fabricate gates to permit 180 degree swing.
 - 2. Gates Construction: ASTM F900 with welded corners. Use of corner fittings is not permitted.
- C. Sliding Gates:
 - 1. Framing and Posts: ASTM F1184, Class 2 for internal rollers.
 - 2. Rollers for cantilever sliding gates: Bearing type. Furnish non-sealed bearings with grease fitting for periodic maintenance.
 - 3. Secure rollers to post or frame without welding.
- D. Cantilever Sliding Gates:
 - 1. Fabricate gate leaf frames and tracks of aluminum conforming to ASTM B429/B429M alloy 6063-T6 or as required to meet performance requirements of ASTM F1184.
 - 2. Frame Members: Minimum 2 inches 0.91 lb/ft aluminum tubing welded assembly forming rigid, one piece unit.
 - 3. Install fabric securely stretched and held in center of tubing.
 - 4. Brace cantilever overhang frames with 3/8 inch brace rods. For gate leaf sizes greater than 23 feet, fabricate with additional lateral support rail welded adjacent to top and bottom horizontal rails.
 - 5. Provide minimum overhang for each leaf opening size as follows:

Opening	Overhang
Up to 10'-0"	6'-6"
10'-0" -14'-0"	7'-6"
14'-1" -22'-0"	10'-0"
22'-1" - 30'-0"	12'-0"

- 6. Track: Combined, integral track and rail.
- 7. Rail: Aluminum extrusion; minimum total weight of 3.72 lb/ft; designed to withstand reaction load of 2,000 lbs.
- 8. Roller Track Assembly: Two swivel type, zinc, die cast trucks having four, sealed lubricant ball bearing wheels minimum 2 inches diameter by 9/16 inches width designed for same reaction load as rail. Provide two side-rolling wheels for each gate leaf to maintain alignment of truck in track.
- 9. Fasten trucks to post brackets by minimum 7/8 inch diameter, 1/2 inch shank ball bolts.

10. Provide galvanized steel guide wheel assemblies consisting of two rubber wheels of minimum 4 inch diameter with oil-impregnated bearings for each supporting post.
11. Attach guide wheel assembly to post so bottom horizontal member rolls between wheels and permitting adjustment to maintain plumb gate frames and proper alignment.

2.5 FINISHES

- A. Components and Fabric: Galvanized to ASTM A123/A123M for components; ASTM A153/A153M for hardware; ASTM A392 for fabric; 2.0 oz/sq ft coating.
- B. Hardware: Galvanized to ASTM A153/A153M, 2.0 oz/sq ft coating.
- C. Accessories: Same finish as fabric.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install framework, fabric, accessories, and gates in accordance with ASTM F567.
- B. Set intermediate, terminal, and gate posts plumb, in concrete footings with top of footing 1 inch above finish grade. Slope top of concrete for water runoff.
- C. Line Post Footing Depth Below Finish Grade: As specified on plans.
- D. Corner, Gate and Terminal Post Footing Depth Below Finish Grade: As specified on plans.
- E. Brace each gate and corner post to adjacent line post with horizontal center brace rail and diagonal truss rods. Install brace rail one bay from end and gate posts.
- F. Install top rail through line post tops and splice with 6 inch long rail sleeves.
- G. Install center and bottom brace rail on corner gate leaves.
- H. Place fabric on outside of posts and rails.
- I. Do not stretch fabric until concrete foundation has cured 28 days.
- J. Stretch fabric between terminal posts or at intervals of 100 feet maximum, whichever is less.
- K. Position bottom of fabric 2 inches above finished grade.
- L. Fasten fabric to top rail, line posts, braces, and bottom tension wire with tie wire at maximum 15 inches on centers.
- M. Attach fabric to end, corner, and gate posts with tension bars and tension bar clips.
- N. Install bottom tension wire or strap stretched taut between terminal posts.
- O. Support gates from gate posts. Do not attach hinged side of gate from building wall.
- P. Install gate with fabric to match fence. Install three hinges on each gate leaf, latch, and catches.
- Q. Install posts with 6 inches maximum clear opening from end posts to buildings, fences and other structures.
- R. Excavate holes for posts to diameter and spacing indicated on plans without disturbing underlying materials.
- S. Center and align posts. Place concrete around posts, and vibrate or tamp for consolidation. Verify vertical and top alignment of posts and make necessary corrections.
- T. Extend concrete footings 1 inch above grade, and trowel, forming crown to shed water.
- U. Allow footings to cure minimum 7 days before installing fabric and other materials attached to posts.

3.2 ERECTION TOLERANCES

- A. Maximum Variation From Plumb: 1/4 inch.
- B. Maximum Offset From Indicated Position: 1 inch.
- C. Minimum distance from property line: 6 inches.

END OF SECTION

SECTION 32 31 13 - CHAIN LINK FENCING AND GATES

PART 1 - GENERAL

1.1 SUMMARY

A. Scope Of Work

1. ALTERNATE #2 – Chain Link Fencing and Gates: Provide chain link fences and gates as complete units controlled by a single source including necessary erection accessories, fittings, and fastenings completely installed and functioning. Work shall include all chain link fencing for the site.
2. All new chain link posts, rails, fabric and hardware shall include a powder coated black matt finish.
3. All chain link fabric shall include a black class 2b PVC fusion bonded coating.
4. Gates that are part of the accessible route shall meet all of the requirements of an accessible door in compliance with CBC Section 11B-404.
5. The levers of lever actuated latches or locks for accessible gates shall be curved with a return to with ½” of the gate surfaces to prevent catching on the clothing or persons per California Referenced Standards Code T-24 Part 12, Section 12-10-202, Item (F). See referenced architectural details and hardware groups.
6. Swing doors and gate surfaces within 10” of the finish floor or ground shall have a smooth surface on the push side extending the full width of the door or gate. Parts creating horizontal or vertical joints ink these surfaces shall be within 1/16” of the same plane as the other and be free of sharp or abrasive edges. Cavities created by added kick plates shall be capped per CBC Section 11B-404.2.10.

B. Related Sections

1. Section 03 30 53 Miscellaneous Cast-In-Place Concrete
2. Section 33 46 23.16 Field Permeable Aggregate

1.2 SUBMITTALS

- A. Submit under provisions of Division1 - Submittals
- B. Product Data: Submit the manufacturer's technical data and installation instructions for metal fencing and gates.
- C. Shop Drawings: Submit shop drawings showing elevations and details of assembly.

1.3 MATERIALS STANDARDS

- A. Materials standards shall adhere to Standards for Galvanized Steel Chain Link Fence Fabric, Standards for Industrial Steel Specifications for Fence Posts and Accessories, Standards for chain Link Fence Installation; as published by Chain Link Fence Manufacturer's Institute (CLFMI); American National Standard Institute (ANSI).
 1. Standards for Galvanized Steel Chain Link Fence Fabric
 2. Standards for Industrial Steel Specifications for Fence Posts and Accessories
 3. Standards for Chain link Fence Installation as published by Chain link Fence Manufacturer's Institute (CLFMI)
 4. American National Standard Institute (ANSI).

1.4 WELDING

- A. All welding shall be completed by a certified welder.

PART 2 - MATERIALS

2.1 GENERAL

- B. Dimensions shown for pipe are outside dimensions.

2.2 STEEL FENCING

- A. Typical Fabric: No. 9 ga. (0.158") finished size steel wires, 2" mesh, with knuckle both top and bottom.
- B. Furnish one-piece fabric widths for fencing up to 10' high.
- C. Fabric finish: galvanized, ASTM A392, Class I, with not less than 1.2 oz. zinc per sq. ft. of surface with black class 2b PVC fusion bonded coating.
- D. Framework: Galvanized steel, ASTM A120 or A123, with not less than 1.8 oz. zinc per sq. ft. of surface with a powder coated black matt finish
- E. Hardware and Accessories: Galvanized steel, ASTM A120 or A123, with not less than 1.8 oz. zinc per sq. ft. of surface, with a powder coated black matt finish. This will include all bolts, nuts and fasteners.

2.3 FRAMING AND ACCESSORIES

- A. End, Corner and Pull Posts: All posts shall be standard steel pipe, straight, true and un-spliced to the greatest extent practical. Minimum sizes and weights shall be as follows:
- B. 4' height, 2.875" o.d. steel pipe, 5.79 lbs. per l.f.
- C. 8' fabric height, 4.0" o.d. steel pipe, 9.11 lbs. per l.f.
- D. 8' fabric height with 15' netting, 6 5/8" o.d. steel pipe, 18 lbs. per l.f.
- E. Gate Posts: Furnish posts for supporting single gate leaf, or one leaf of a double-gate installation, for nominal gate widths as follows:

Leaf	Width	Gate Post	Lbs/L.F.
5', 10' & 12' (Clear)	4.000"	o.d. pipe	9.11

- F. Line Posts: All posts shall be standard steel pipe, straight, true and up to 20 ft. length to be unspliced. Minimum sizes and weights as follows:
1. Space 10' o.c. maximum, unless otherwise indicated.
 2. 6' fabric height, 2.375" o.d. steel pipe, 3.65 lbs. per l.f.
 3. 8' fabric height, 2.875" o.d. steel pipe, 5.79 lbs. per l.f.
- G. Top, Bottom and Intermediate Rails: Manufacturer's longest lengths, with expansion type couplings, approximately 6" long, for each joint. Provide means for attaching top rail securely to each gate corner, pull and end post. Rails shall be 1.66 o.d. pipe, 2.27 lbs. per l.f.
- H. Post Brace Assembly: Manufacturer's standard adjustable brace at end and gate posts and at both sides of corner and pull posts, with horizontal brace located at mid-height of fabric. Use same material as top rail for brace, and truss to line posts with 0.375" diameter rod and adjustable tightener.
- I. Post Tops: Weather-tight closure cap (for tubular posts), one cap for each post. Furnish caps with openings to permit passage of top rail.
- J. Stretcher Bars: One-piece lengths equal to full height of fabric, with minimum cross-section of 3/15" x 3/4". Provide one stretcher bar for each gate and end post, and two for each corner and pull post.
- K. Stretcher Bar Bands: Space not over 15" o.c., to secure stretcher bars to end, corner, pull, and gate-posts. Provide offset type bar bands at posts if required so that fabric is aligned with inside edge of posts.

- L. Tension Wire: Shall be marcelled (spiraled or crimped) #7 gauge, 0.177 inches in diameter, conforming to ASTM A-824. Color to be black and match fabric.
- M. Wire Ties: For tying fabric to line posts, use wire ties spaced 18" o.c. For tying fabric to rails and braces, use wire ties spaced maximum 18" o.c.

2.4 GATES

- A. Gate Posts: Furnish 4.0" o.d. posts, 9.11 lbs/lf, for supporting a single gate leaf of nominal 4', 5', 7', 10' or 12' lengths.
- B. Fabricate swing gate perimeter frames of minimum 1-5/8" o.d. pipe. Metal and finish to match framework. Provide horizontal and vertical members to ensure proper gate operation and for attachment of fabric, hardware and accessories.
- C. Assemble gate frames by welding or with special fittings and rivets, for rigid connections. Use same fabric as for fence, unless otherwise indicated. Install fabric with stretcher bars at vertical and top and bottom edges. Attach stretchers to gate frames at not more than 15" o. c. Attach hardware to provide security against removal or breakage. Install diagonal cross bracing consisting of 3/8" diameter adjustable length truss rods on gates to ensure frame rigidity without sag or twist, as required.

2.5 GATE HARDWARE

- A. Furnish the following hardware and accessories for each gate.
 - 1. Hinges: Size and material to suit gate size, non-lift-off type, offset to permit opening per detail or unobstructed rolling gate operation.
 - 2. Latch: Forked type or plunger-bar type to permit operation from either side of gate, with padlock eye as integral part of latch. Latches shall be Fulcrum type or approved equal.
 - 3. Provide solid kick plate, 3/16" thickness at bottom of gates per details.
- B. Hardware for gates in an accessible path-of-travel: As indicated on the Drawings If not indicated, provide hardware as follows:
 - 1. Swing gate hardware: For gates in path of travel, comply with exit door requirements (CBC Section 1003.3.2).
 - 2. Hinges: 180-degree swing. Non-lift-off type. Provide 1-1/2 pair of hinges for each leaf over 6-foot nominal height.
 - 3. Provide hardware that does not require pinching, grasping or twisting motion to operate and provide solid kick plates 10 inches minimum high, 3 inches maximum from the paving on both sides of gate.
 - 4. Unlatching force for exit devices shall not exceed 15 pounds applied in the direction of travel, in compliance with UBC Standard 10-4.
 - 5. Exit devices shall comply with CBC Section 1003.3.1.9.
 - 6. Provide hardware of stainless steel or zinc coated steel, with weight of zinc coating not less than 2.0 ounces per square foot

PART 3 - INSTALLATION

3.1 CHAIN LINK FENCE INSTALLATION

- A. Excavation: Drill holes for posts of diameters shown in firm, undisturbed or compacted soil. Excavate holes to minimum diameter and depth as shown on the drawings. Excavate hole depths approximately 4" lower than post bottom. Refer to drawings for depth.
- B. Setting Posts: Center and align posts in holes 4" above bottom of excavation. Place concrete around posts and vibrate or tamp for consolidation. Check each post for vertical and top alignment, and hold in position during placement and finishing operations. No concrete or concrete grout is to extend beyond limits of footing hole.

- C. Top Rails: Run rail continuously through post caps, bending to radius for curved runs. Provide expansion couplings as recommended by fencing manufacturer.
- D. Brace Assemblies: Install braces so posts are plumb when diagonal rod is under proper tension.
- E. Fabric: Leave approximately 1" between finish grade and bottom selvage. Fabric to be installed so that a baseball cannot roll underneath the fabric. Pull fabric taut and tie to posts and rails. Install fabric on the field side of fence, and anchor to framework so that fabric remains in tension after pulling force is released.
- F. Stretcher Bars: Thread through or clamp to fabric 4" o.c., and secure to posts with metal bands spaced 14" o.c. maximum. Align off set type stretcher bar bands to allow fabric to align with field side of posts. A maximum of ½" displacement will be allowed.
- G. Tension Wire: Shall be stretched from end to end of each stretch of fence where indicated on drawings and details. The tension wire shall be taut and free of sag.
- H. Tie Wires: Use U-shaped wire, conforming to diameter of pipe to which attached, clasping pipe and fabric firmly with ends twisted at least two full turns. Bend wire to minimize hazard to persons or clothing.
- I. Fasteners: Install nuts for tension bands and hardware bolts on side of fence opposite fabric side. Peen ends of bolts or score threads to prevent removal of nuts.

3.2 GATE INSTALLATION

- A. Install gates plumb, level, and secure for full opening without interference. The clear opening shall be equal to or larger than the size specified on the drawings. Install ground-set items in concrete for anchorage, as recommended by fence manufacturer. Adjust hardware for smooth operation and lubricate where necessary.

3.3 GROUT AND ANCHORING CEMENT

- A. Non-shrink, Nonmetallic Grout: Factory-packaged, non-staining, noncorrosive, nongaseous grout complying with ASTM C 1107/C 1107M. Provide grout, recommended in writing by manufacturer, for exterior applications.
- B. Anchoring Cement: Factory-packaged, non-shrink, non-staining, hydraulic-controlled expansion cement formulation for mixing with water at Project site to create pourable anchoring, patching, and grouting compound. Provide formulation that is resistant to erosion from water exposure without needing protection by a sealer or waterproof coating, and that is recommended in writing by manufacturer for exterior applications

END OF SECTION 32 31 13
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SECTION 32 84 00 – FIELD WASHWATER

PART 1 - GENERAL

1.1 SUMMARY

- A. It is the intent of the specifications and drawings that the finished system is complete in every respect and shall be ready for operation satisfactory to the College.
- B. The work shall include all materials, labor, services, transportation, and equipment necessary to perform the work as indicated on the drawings, in these specifications, and as necessary to complete the contract.
- C. The new improvements will connect existing mainline and valves as indicated on the drawings. Improvements will be installed downstream of a new backflow prevention device and will include the following:
 - 1. Furnish and install new isolation valves and boxes, piping, quick coupling valves and boxes.
 - 2. Coordinate all work with existing utilities on site.
 - 3. Furnish and install comboxes, hand holes and empty conduit for electrical associated with this work. Coordinate with site electrical installations.
 - 4. Coordinate work with new irrigation systems included for landscape and restoration areas all of which shall remain in operation throughout the entirety of the construction period.
- D. The Standard Specifications for Public Works Construction, “Greenbook”, latest edition, is referenced as if herein contained and the Contractor shall keep a copy at the project site. These Specifications shall supersede conflicts with information given in the “Greenbook”, unless otherwise determined by the College District.
- E. Definitions
 - 1. Owner: College of the Redwoods
 - 2. Architect: Architect or Architect’s designated representative.
 - 3. Water Supplier: TBD
 - 4. Landscape Architect: Field Landscape Architect or his designated representative.

1.2 CONSTRUCTION DRAWINGS

- A. Due to the scale of the drawings, it is not possible to indicate all offsets, fittings, sleeves, etc. which may be required. The Contractor shall carefully investigate the structural and finished conditions affecting all of his work and plan his work accordingly, furnishing such fittings, etc. as may be required to meet such conditions. Drawings are generally diagrammatic and indicative of the work to be installed. The work shall be installed in such a manner as to avoid conflicts between irrigation systems, planting, and architectural features.
- B. All work called for on the drawings by notes or details shall be furnished and installed whether or not specifically mentioned in the specifications. When an item is shown on the plans but not shown on the specifications or vice versa, it shall be deemed to be as shown on both. The Architect shall have final authority for clarification.
- C. The Contractor shall not willfully install the irrigation system as shown on the drawings when it is obvious in the field that obstructions, grade differences or discrepancies in area dimensions exist that might not have been considered in Architecting. Such obstructions or differences should be brought to the attention of the Architect as soon as detected. In the event this notification is not performed, the Irrigation Contractor shall assume full responsibility for any revision necessary.

1.3 QUALITY ASSURANCE

- A. Provide at least one English speaking person who shall be present at all times during execution of this portion of the work and who shall be thoroughly familiar with the type of materials being installed and the manufacturer's recommended methods of installation and who shall direct all work performed under this section.
- B. Manufacturer's directions and detailed drawings shall be followed in all cases where the manufacturer of articles used in this contract furnishes directions covering points not shown in the drawings and specifications.
- C. All local, municipal, and state laws, rules and regulations governing or relating to any portion of this work are hereby incorporated into and made a part of these specifications, and their provisions shall be carried out by the Contractor. Anything contained in these specifications shall not be construed to conflict with any of the above rules and regulations of the same. However, when these specifications and drawings call for or describe materials, workmanship, or construction of a better quality, higher standard, or larger size than is required by the above rules and regulations, the provisions of these specifications and drawings shall take precedence.
- D. All materials supplied for this project shall be new and free from any defects. All defective materials shall be replaced immediately at no additional cost to Owner.
- E. The Contractor shall secure the required licenses and permits including payments of charges and fees, give required notices to public authorities, verify permits secured or arrangements made by others affecting the work of this section.

1.4 SUBMITTALS

- A. Materials List:
 - 1. After award of contract and before any irrigation system materials are delivered to the job site, submit to the Architect a complete list of all irrigation systems, materials, or processes proposed to be furnished and installed as part of this contract.
 - 2. Show manufacturer's name and catalog number for each item, furnish complete catalog cuts and technical data, furnish the manufacturer's recommendations as to the method of installation.
 - 3. No substitutions will be allowed without prior written acceptance by the Architect.
 - 4. Manufacturer's warranties shall not relieve the Contractor of his liability under the guarantee. Such warranties shall only supplement the guarantee.
- B. Substitutions:
 - 1. If the Irrigation Contractor wishes to substitute any equipment or materials for equipment or materials listed on the irrigation drawings and specifications, he may do so by providing the following information to the Architect for approval.
 - 2. Provide a written statement indicating the reason for making the substitution.
 - 3. Provide catalog cut sheets, technical data, and performance information for each substitute item.
 - 4. Provide in writing the difference in installed price if the item is accepted.

1.5 EXISTING CONDITIONS

- A. The Contractor shall verify and be familiar with the locations, size and detail of points of connection provided as the source of water and electrical supply, connection to the irrigation system.
- B. Irrigation design is based on the available static water pressure anticipated to be on site. For design purposes, this is assumed to be 60 psi. Contractor shall verify static water on the project prior to the start of construction. Should a discrepancy exist, notify the Architect authorized representative prior to beginning construction.
- C. Prior to cutting into the soil, the Contractor shall locate all cables, conduits, sewer septic tanks, and other utilities as are commonly encountered underground and he shall take proper

precautions not to damage or disturb such improvements. If a conflict exists between the such obstacles and the proposed work, the Contractor shall promptly notify the Architect who will arrange for relocations. The Contractor will proceed in the same manner if a rock layer or any other such conditions are encountered.

- D. The Contractor shall protect all existing utilities and features to remain on and adjacent to the project site during construction. Contractor shall repair, at his own cost, all damage resulting from his operations or negligence.

1.6 INSPECTIONS

- A. The Contractor shall permit the Architect to visit and inspect at all times any part of the work and shall provide safe access for such visits.
- B. Where the specifications require work to be tested by the Contractor, it shall not be covered over until accepted by the Architect. The Contractor shall be solely responsible for notifying the, Architect, a minimum of 48 hours in advance, where and when the work is ready for testing. Should any work be covered without testing or acceptance, it shall be, if so ordered, uncovered at the Contractor's expense.
- C. Inspections will be required for the following at a minimum:
 - 1. System layout
 - 2. Pressure test requirements:
 - a. Irrigation main line – one hour at 150 PSI
 - b. All lateral lines shall be pressure tested - 2 hours at 100 psi.
 - 3. Coverage test of irrigation system
 - 4. Final inspection prior to start of maintenance period
 - 5. Final acceptance
- D. Site observations and testing will not commence without the record drawings as prepared by the Irrigation Contractor. Record drawings must be complete and up to date for each site visit.
- E. Work that fails testing and is not accepted will be re-tested. Hourly rates and expenses of the Architect for re-inspection or re-testing will be paid by the Irrigation Contractor at no additional expense to the College District.

1.7 STORAGE AND HANDLING

- A. Use all means necessary to protect irrigation system materials before, during, and after installation and to protect the installation work and materials of all other trades. In the event of damage, immediately make all repairs and replacements necessary to the acceptance of the Architect and at no additional cost to the College District.
- B. Exercise care in handling, loading, unloading, and storing plastic pipe and fittings under cover until ready to install. Transport plastic pipe only on a vehicle with a bed long enough to allow the pipe to lay flat to avoid undue bending and concentrated external load.

1.8 CLEANUP AND DISPOSAL

- A. Dispose of waste, trash, and debris in accordance with applicable laws and ordinances and as prescribed by authorities having jurisdiction. Bury no such waste material and debris on the site. Burning of trash and debris will not be permitted. The Contractor shall remove and dispose of rubbish and debris generated by his work and workmen at frequent intervals or when ordered to do so by the Architect.
- B. At the time of completion the entire site will be cleared of tools, equipment, rubbish and debris which shall be disposed of off-site in a legal disposal area.

1.9 TURNOVER ITEMS

- A. Drawings of Record:
1. Record accurately on one set of contract drawings all changes in the work constituting departures from the original contract drawings.
 2. The changes and dimensions shall be recorded in a legible and workmanlike manner to the satisfaction of the College. Prior to final inspection of work, submit record drawings to the Architect.
 3. Dimensions from/to permanent points of reference such as buildings, sidewalks, curbs, etc. shall be shown. Data on record drawings shall be recorded on a day to day basis as the project is being installed. All lettering on drawings shall be minimum 1/8 inch in size.
 4. Show locations and depths of the following items:
 - a. Point of connection (including water P.O.C., master control valves, quick couplers, etc.)
 - b. Routing of sprinkler pressure lines (dimensions shown at a maximum of 100 feet along routing)
 - c. Isolation valves
 - d. Quick coupling valves
 - e. Related equipment (as may be directed)
 - f. Maintain record drawings on site at all times. Upon completion of work, transfer all as-built information and dimensions to reproducible sepia prints.
- B. Operation and Maintenance Manuals:
1. Two individually bound copies of operation and maintenance manuals shall be delivered to the Architect authorized representative at least 10 calendar days prior to final inspection. The manuals shall describe the material installed and the proper operation of the system.
 2. Each complete, bound manual shall include the following information:
 - a. Index sheet stating Contractor's address and telephone number, duration of guarantee period, list of equipment including names and addresses of local manufacturer representatives.
 - b. Operating and maintenance instructions for all equipment.
 - c. Spare parts lists and related manufacturer information for all equipment.
- C. Equipment:
1. Supply as a part of this contract the following items:
 - a. Two (2) quick coupler keys with a 1" bronze hose bib, bent nose type with hand wheel and two coupler lid keys.
 - b. One (1) valve box cover key or wrench.
1. The above equipment shall be turned over to the Architect at the final inspection.

1.10 COMPLETION

- A. At the time of the pre-maintenance period inspection, the Architect, and governing agencies will inspect the work, and if not accepted, will prepare a list of items to be completed by the Contractor. At the time of the post-maintenance period or final inspection the work will be re-inspected and final acceptance will be in writing by the Architect.
- B. The Architect shall have final authority on all portions of the work.
- C. After the system has been completed, the Contractor shall instruct College District's authorized representative in the operation and maintenance of the irrigation system and shall furnish a complete set of operating and maintenance instructions.
- D. The Contractor without any additional expense to the College District shall repair any settling of trenches, which may occur during the one-year period following acceptance, to the College District's satisfaction. Repairs shall include the complete restoration of all damage to planting, paving or other improvements of any kind as a result of the work.

1.11 GUARANTEE

- A. The entire sprinkler system, including all work done under this contract, shall be unconditionally guaranteed against all defects and fault of material and workmanship, including settling of backfilled areas below grade, for a period of one (1) year following the filing of the Notice of Completion.
- B. Should any problem with the irrigation system be discovered within the guarantee period, the Contractor at no additional expense to College District with the exception of existing equipment utilized shall correct it within ten (10) calendar days of receipt of written notice from the College District. When the nature of the repairs as determined by the College District constitute an emergency (i.e. broken pressure line) the College District may proceed to make repairs at the Contractor's expense. Any and all damages to existing improvement resulting either from faulty materials or workmanship, or from the necessary repairs to correct same, shall be repaired to the satisfaction of the owner by the Contractor, all at no additional cost to the College District.
- C. Guarantee shall be submitted on Contractors own letterhead as follows:

GUARANTEE FOR WASHWATER SYSTEM

We hereby guarantee that the sprinkler irrigation system we have furnished and installed is free from defects in materials and workmanship, and the work has been completed in accordance with the drawings and specifications, ordinary wear and tear and unusual abuse, or neglect excepted. We agree to repair or replace any defective material with the exception of existing equipment utilized during the period of one year from date of filing of the Notice of Completion and also to repair or replace any damage resulting from the repairing or replacing of such defects at no additional cost to the owner. We shall make such repairs or replacements within 10 calendar days following written notification by the owner. In the event of our failure to make such repairs or replacements within the time specified after receipt of written notice from owner, we authorize the owner to proceed to have said repairs or replacements made at our expense and we will pay the costs and charges therefore upon demand.

PROJECT NAME:

PROJECT LOCATION:

CONTRACTOR NAME:

ADDRESS:

TELEPHONE:

SIGNED:

DATE:

1.12 QUALIFICATIONS

- A. The Contractor or subcontractor responsible for field and track subgrade establishment, field subsurface drainage, field washwater and irrigation systems, and field permeable aggregate placement and compaction shall be submitted to the Field Landscape Architect for approval. Specific prequalification requirements are included as follows:
 - 1. Contractor or sub-contractor shall be and has been actively and directly engaged in constructing similar natural or synthetic field projects for a period of five (5) or more years and shall provide proof of four (4) or more sports field base installations completed in the

past two (2) years. as used in this section means a project similar in character to the work in which each respective firm or their employee will perform on this project. The "similar project" shall also be equal or greater in scale and complexity than the work for which each firm will be engaged to perform on this project. The "similar" project must be a natural or synthetic turf athletic field and/or a rubberized running track project, consisting of at least 75,000 sf of field surface area and a 400m, 8 lane running track. The Contractor's experience shall include completion of high school, college, or professional level competition fields. The playing field system shall include earthwork, washwater or irrigation systems, drainage and subsurface drainage systems, and base aggregate placement and compaction. Provide a listing of all construction contracts (whether completed or in progress) entered into or performed by the Contractor or subcontractor within the past five years for projects similar in scope, time and complexity to the work called for under this Contract; include the names of the contracts, and the names and contact information of the owners.

PART 2 - MATERIALS

2.1 SUMMARY

- A. Use only new materials of the manufacturer, size and type shown on the drawings and specifications. Materials or equipment installed or furnished that do not meet College District's standards will be rejected and shall be removed from the site at no expense to the College District.

2.2 PIPE

- A. Pressure supply lines downstream of point of connection 3" or greater shall be Class 315 solvent weld PVC. Piping shall conform to ASTM D2241. Pressure supply lines downstream of the point of connection 2 1-2" or less shall be Schedule 40, in conformance to ASTM D2241.
- B. Lateral pipe / non-pressure lines 3/4 inch in diameter and larger downstream of the remote control valve shall be Schedule 40 solvent weld PVC conforming to ASTM D1785.

2.3 PLASTIC PIPE AND FITTINGS

- A. Pipe shall be marked continuously with manufacturer's name, nominal pipe size, schedule or class, PVC type and grade, National Sanitation Foundation approval, Commercial Standards designation, and date of extrusion.
- B. All plastic pipe shall be extruded of an improved PVC virgin pipe compound in accordance with ASTM D2241 or ASTM D1785.
- C. All solvent weld PVC fittings shall be standard weight Schedule 80 conforming to ASTM D1785 at valve assemblies including all ells, tees, and unions with all other PVC fittings to be Schedule 40 and shall be injection molded of an improved virgin PVC fitting compound. Slip PVC fittings shall be the "deep socket" bracketed type. Threaded plastic fittings shall be injection molded. All tees and ells shall be side gated. All fittings shall conform to ASTM D2466.
- D. All threaded nipples shall be standard weight Schedule 80 with molded threads and shall conform to ASTM D1785.
- E. All solvent cementing of plastic pipe and fittings shall be a two-step process, using primer and solvent cement applied per the manufacturer's recommendations. Cement shall be of a fluid consistency, not gel-like or ropy. Solvent cementing shall be in conformance with ASTM D2564 and ASTM D2855.
- F. When connection is plastic to metal, female adapters shall be hand tightened, plus one turn with a strap wrench. Joint compound shall be non-lead base Teflon paste, tape, or equal.

2.4 VALVES

- A. Gate Valves
 - 1. Gate valves shall be of the manufacturer, size, and type indicated on the drawings.
 - 2. Gate valves shall be constructed of a bronze body, gate and stem with a malleable iron hand wheel. Gate valves shall have threaded connections.
 - 3. All gate valves shall have a minimum working pressure of not less than 150 psi and shall conform to AWWA standards.
 - 4. Quality Standard to be M&H 4067-07, at line size.
- B. Quick Coupler Valves:
 - 1. Potable Quick-coupling valves shall be bronze two-piece construction or iron body, bronze mounted, globe pattern. Pressure rating to be 150 psi. Connections shall be iron pipe, threaded. Cover shall be yellow. Valves to be Rainbird 44-LRC, 1", two-piece. Potable water valves shall have dual lug configuration.
 - 2. Contractor is to furnish to the Owner six couplers with 1 " x 1" swivel and hose assemblies. Hose swivels shall be attached with two coupler keys.
 - 3. Valves to be housed as shown in the details, for installation in or adjacent to the concrete turf anchor.
 - 4. Work to include layout, trenching, pipe installations, backfill, quick coupling valves, valve boxes, riser assemblies, and related items.
 - 5. Quick Coupler Valves shall be installed with as Lasco Swing Joint #G332-212.

2.5 VALVE BOXES

- A. Valve boxes shall be fabricated from a durable, weather-resistant plastic material resistant to sunlight and chemical action of soils.
- B. The potable valve box covers shall be green in color and secured with a hidden latch mechanism or bolts.
- C. The cover and box shall be capable of sustaining a load of 1,500 pounds.
- D. Valve box extensions shall be by the same manufacturer as the valve box.
- E. Gate valve and quick coupler valve boxes outside of field limits shall be Carson No. 1220 rectangular plastic boxes with plastic lids. Valve box covers shall be marked with either "GV" or "QCV" "heat branded" onto the cover in 2-inch-high letters.
- F. Quick Coupler Valves at synthetic turf field shall be housed in TurfCool Quick Connect Valve Box, TC-3700-QCV as manufactured by Sportsfield Specialties Inc. (1-888-975-3343), or approved equal. Box shall be equipped and/or modified to have synthetic turf or rubberized surfacing cover as detailed.

2.6 DETECTABLE MARKING TAPE

- A. Detectable marking tape: Christy's 3" detectable marking tape consists of a minimum 5 mil overall thickness; five ply composition; ultra-high molecular weight; 100% virgin polyethylene; acid, alkaline and corrosion resistant. The tape shall have a 20 gauge solid aluminum foil core, encapsulated within 2.55 mil polyethylene backing. Tape tensile strength shall be in accordance with ASTM D882-80A and be not less than 7,800 psi. Tape legend—Caution Irrigation Line Below. TA-DT-3-GI.

2.7 SLEEVING

- A. All pipe and wire sleeves shall be schedule 40 PVC. Valve control wires shall be installed in a separate sleeve. All sleeving shall be installed 24 inches below finish grade.

2.8 MARKING TAGS

- A. All appurtenances shall be installed with polyurethane warning tags manufactured by T. Christy Enterprises or approved equal. Tags shall read valve number, which shall match the zone valve designation at the controller. Tags shall be yellow, with black ink.

PART 3 - EXECUTION

3.1 SITE CONDITIONS

- A. Inspections:
 - 1. Prior to all work of this section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.
 - 2. Verify that irrigation system may be installed in strict accordance with all pertinent codes and regulations, the original design, the referenced standards, and the manufacturer's recommendations.
- B. Discrepancies:
 - 1. In the event of discrepancy, immediately notify the Architect.
 - 2. Do not proceed with installation in areas of discrepancy until all discrepancies have been resolved.
- C. Grades:
 - 1. Before starting work, carefully check all grades to determine that work may safely proceed, keeping within the specified material depths with respect to finish grade.
 - 2. The Architect shall accept final grades before work on this section will be allowed to begin.
- D. Field Measurements:
 - 1. Make all necessary measurements in the field to ensure precise fit of items in accordance with the original design. Contractor shall coordinate the installation of all irrigation materials with all other work.
 - 2. All scaled dimensions are approximate. The Contractor shall check and verify all size dimensions prior to proceeding with work under this section.
 - 3. Exercise extreme care in excavating and working near existing utilities. Contractor shall be responsible for damages to utilities, which are caused by his operations or neglect.
- E. Layout:
 - 1. Prior to installation, the Contractor shall stake out all pressure supply lines, routing and location of sprinkler heads, valves, backflow preventer, and automatic controller.
 - 2. Layout irrigation system and make minor adjustments required due to differences between site and drawings. Where piping is shown on drawings under paved areas, but running parallel and adjacent to planted areas, install the piping in the planted areas.
- F. Water Supply:
 - 1. Connections to, or the installation of, the water supply shall be at the locations shown on the drawings. Minor changes caused by actual site conditions shall be made at no additional expense to the College District.
- G. Electrical Service:
 - 1. Connections to the electrical supply shall be at the locations shown on the drawings. Minor changes caused by actual site conditions shall be made at no additional expense to College District.
 - 2. Contractor shall make electrical connections to the irrigation controller.

3.2 CONNECTIONS TO EXISTING MAINS

- A. All connections shall be made to existing pipes by wet tap. All size on size taps will require a full cast iron (Mueller Type), or an epoxy coated type JCM fabricated steel tapping sleeve per

Water District Standards. All connections to existing mains shall be in strict accordance with the appropriate subsections APWA Section 742.

3.3 TRENCHING

- A. Excavations shall be straight with vertical sides, even grade, and support pipe continuously on bottom of trench. Trenching excavation shall follow layout indicated on drawings to the depths below finished grade and as noted. Where lines occur under paved area, these dimensions shall be considered below subgrade.
 - 1. Provide minimum cover of 24 inches on pressure supply lines.
 - 2. Provide minimum cover of 24 inches for control wires.
 - 3. Provide minimum cover of 18 inches for non-pressure lines.
 - 4. Pipes installed in a common trench shall have a 6-inch minimum space between pipes.

3.4 BACKFILLING

- A. Backfill material 6" below and 6" above pipe shall be clean washed sand. Backfill material above sand for all lines shall be the same as adjacent soil free of debris, litter, and rocks over 1/2 inch in diameter, except where backfill may occur within synthetic turf field aggregate or lateral drain line trenches where backfill shall match adjacent materials.
- B. Backfill shall be tamped in 4-inch layers under the pipe and uniformly on both sides for the full width of the trench and the full length of the pipe. Backfill materials shall be sufficiently damp to permit thorough compaction, free of voids. Backfill shall be compacted to 90% relative compaction and shall conform to adjacent grades.
- C. Flooding in lieu of tamping is not allowed.
- D. Under no circumstances shall truck wheels be used to compact backfill.
- E. Provide sand backfill a minimum of 6 inches over and under all piping under paved areas.

3.5 PIPING

- A. Piping under existing pavement may be installed by jacking, boring, or hydraulic driving. No hydraulic driving is permitted under asphalt pavement.
- B. Cutting or breaking of existing pavement is not permitted.
- C. Carefully inspect all pipe and fittings before installation, removing dirt, scale, burrs, and reaming. Install pipe with all markings up for visual inspection and verification.
- D. Remove all dented and damaged pipe sections.
- E. All lines shall have a minimum clearance of 6 inches from each other and 12 inches from lines of other trades.
- F. Parallel lines shall not be installed directly over each other.
- G. In solvent welding, use only the specified primer and solvent cement and make all joints in strict accordance with the manufacturer's recommended methods including wiping all excess solvent from each weld. Allow solvent welds at least 15 minutes setup time before moving or handling and 24 hours curing time before filling.
- H. PVC pipe shall be installed in a manner, which will provide for expansion and contraction as recommended by the pipe manufacturer.
- I. Centerload all plastic pipe prior to pressure testing.
- J. All threaded plastic-to-plastic connections shall be assembled using Teflon tape or Teflon paste.
- K. For plastic-to-metal connections, work the metal connections first. Use a non-hardening pipe dope an all-threaded plastic-to-metal connections, except where noted otherwise. All plastic-to-metal connections shall be made with plastic female adapters.

3.6 VALVES

- A. Quick coupler valves and gate valves shall be installed in the approximate locations indicated on the drawings.

- B. Valve shall be installed in shrub areas whenever possible.
- C. Install all valves as indicated in the detail drawings.
- D. Valves to be installed in valve boxes shall be installed one valve per box.

3.7 VALVE BOXES

- A. Valve boxes shall be installed in landscape areas whenever possible, except as specifically noted in synthetic turf field.
- B. Each valve box shall be installed on a foundation of 3/4 inch gravel backfill, 3 cubic feet minimum. Valve boxes shall be installed with their tops 1/2 inch above the surface of surrounding finish grade in landscape areas. Valve boxes in synthetic turf shall provide a flush transition for infill level at box perimeter.

3.8 QUICK COUPLING VALVE (QCV) INSTALLATION

- A. All piping shall be thoroughly flushed through extended risers before quick coupling valves (QCV) are attached.
- B. Quick coupling valves shall be installed as indicated in the details, perpendicular to the surface. Valve top to be between 1" to 1-1/2" below inside surface of box lid.
- C. When installing QCV the top nipple of the riser assembly is to be threaded to QCV above ground, carefully checking so as not to cross-thread. Then thread nipple with QCV to intermediate coupling.

3.9 QUICK COUPLING VALVE BOX INSTALLATION

- A. Valves to be housed in box and flush with the synthetic turf surface.

3.10 MISCELLANEOUS EQUIPMENT

- A. Install all assemblies specified herein according to the respective detail drawings or specifications, using best standard practices.

3.11 FIELD QUALITY CONTROL

- A. Field inspection will be performed by the College and system Designer.
- B. Inspections by College Representative:
 - 1. Material inspection: Inspection at the job site of all materials to be used on the job. The contractor shall store the materials at the job site in a locked container. Note: no work shall start until all the materials to be used on the job are approved by the College representative. NOTE: The College shall not be responsible for the theft or damage of any tools or materials left on site.
 - 3. Irrigation main line open trench equipment inspection: remote control valves, quick couplers, air valves etc.
 - 4. Lateral line open trench inspection. Note: the contractor, at his discretion, may partially backfill the trenches before inspection and approval. The pipe joints, swing joints, spray and rotor heads must be exposed for inspection.
 - 5. Coverage test.
 - 6. Final inspection and approval.
 - 7. After each inspection, no work shall start on the next phase until the work to date has been approved in writing and all corrections are completed by the contractor.
- C. Pressure Test: Prior to complete backfilling, test all pressure lines for leakage.
 - 1. Test all pressure lines under hydrostatic pressure of 150 pounds per square inch or 50 pounds more than normal static pressure (whichever is greater), and prove watertight for one hour.
 - a. Note: If any of the threaded metal pipe joints assembled with Permatex 51 D pipe joint compound are leaking and causing the system to fail the pressure test, re-test the

- system for twenty-four hours under the required test pressure before disassembling the leaking fittings. Permatex 51 D has self-sealing properties under pressure and time.
2. The College Representative may require (at his/her discretion) the pressure testing of the main line prior to installation of electric control valves, quick couplers, saddles or any other equipment that might prevent a proper test from being performed.
 3. Test all piping under paved areas under hydrostatic pressure of 150 pounds per square inch for two hours, and prove watertight prior to paving.
 4. Test all lateral piping lines under hydrostatic pressure of 100 pounds per square inch, or 50 pounds more than normal static pressure (whichever is greater), and provide water tight for 2 hours.
 4. Sustain pressure in lines for no less than one hour (main line) and two hours (lateral lines). If leaks develop (more than 5 percent), replace joints and repeat test until entire system is proved watertight.
 5. All hydrostatic tests shall be conducted only in the presence of the College Representative. Do not completely backfill pipe until it has been inspected, tested and approved in writing.
 6. Furnish necessary force pump and all other test equipment.
 8. Provide handheld walkie-talkie or personnel as necessary to accomplish this task expeditiously.
 9. Upon completion of each phase of work, test and adjust entire system to meet site requirements.
- D. System is acceptable if no leakage or loss of pressure occurs during test period.

3.12 FLUSHING THE SYSTEM

- A. Prior to installation of irrigation heads, the valves shall be opened and a full head of water used to flush out the lines and risers.
- B. Irrigation heads shall be installed after flushing the system has been completed.

3.13 TESTING AND OBSERVATION

- A. Do not allow or cause any of the work of this section to be covered up or enclosed until it has been observed, tested and accepted by the Architect.
- B. The Contractor shall be solely responsible for notifying the Architect, a minimum of 48 hours in advance, where and when the work is ready for testing.
- C. When the sprinkler system is completed, the Contractor shall perform a coverage test of each system in its entirety to determine if the water coverage for the planted areas is complete and adequate in the presence of the Architect.
- D. The Contractor shall furnish all materials and perform all work required to correct any inadequacies of coverage due to deviations from the plans, or where the system has been willfully installed as indicated on the drawings when it is obviously inadequate, without bringing this to the attention of the Architect. This test shall be accepted by the Architect and accomplished before starting any planting.
- D. Final inspection will not commence without record drawings as prepared by the Irrigation Contractor.

3.14 COMPLETION CLEANING

- A. Clean-up shall be made as each portion of the work progresses. Refuse and excess dirt shall be removed from the site, all walks and paving shall be broomed, and any damage sustained on the work of others shall be repaired to original conditions.

END OF SECTION 32 84 00
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SECTION 32 92 19 - SEEDING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. All material, labor, and equipment necessary to perform the Work including but not limited to:
 - a. Soil preparation.
 - b. Seeding.
 - c. Applying straw and tackifier.
2. Work specified within this section shall comply with the Project's SWPPP requirements per Section 31 25 13 Erosion Controls.

B. Unless otherwise noted, the Contractor shall provide all materials, equipment, and labor necessary to produce finished Work as shown on the Drawings and as specified herein.

C. Related Sections:

1. Section 01 29 00 Measurement and Payment
2. Section 01 50 00 Temporary Facilities and Controls
3. Section 31 05 13 Soils for Earthwork
4. Section 31 25 13 Erosion Controls

1.2 REFERENCES

A. Nomenclature:

1. The Jepson Manual: Vascular Plants of California, Second Edition, University of California Press, Berkeley, CA.

B. California Seed Law (California Department of Food and Agriculture). More information is available online at:

1. http://www.cdfa.ca.gov/plant/pe/nursery/pdfs/SeedLaw_2011.pdf
2. <http://www.cdfa.ca.gov/phpps/pe/nursery/Seed.html>

C. All standards shall include the latest additions and amendments as of the date of advertisement for bids.

D. American Society for Testing and Materials (ASTM):

1. D7047-04: Standard Test Method for Mucilloid Content of Plantago Insularis (Ovata, Psyllium) Used as a Tackifier.

1.3 SUBMITTALS

A. Prior to application, Contractor shall submit to College of the Redwoods Project Manager a signed acknowledgment from each supplier indicating that the seeding material meets requirements specified herein.

B. Contractor shall submit the following:

1. For Contractor-provided seed: A letter, or appropriate seed lot tags, from seed supplier stating the botanical name, common name, provenance, minimum percent purity, minimum percent germination, and pounds pure live seed of the seed mix prior to application.

2. Proof that the tackifier meets the Specifications described in this section.
 3. Prior to delivery of straw to Project site, submit the name, address, and telephone number of the mulch supplier and proof that the mulch meets the Specifications described in this section.
 4. Hydroseeding and hydromulching: Proposed areas and proposed methods for hydroseeding and hydromulching.
- C. In the event that the Contractor chooses to force germinate, the Contractor shall submit a shop drawing of the proposed irrigation system as described in this section.

1.4 COORDINATION

- A. Timing of seeding application is subject to the timeframes and conditions specified in sub-Section Broadcast Seeding.
- B. Timing of soil preparation, seeding, and mulching work shall be coordinated and sequenced with other project work.
1. All earthwork and grading of the site shall be complete per Division 31 – Earthwork prior to beginning soil preparation.
 2. Prior to installation of biodegradable mat and erosion control blanket per Division 31 - Earthwork, the application of seed, straw, and tackifier shall be approved by the Project Manager in all areas receiving biodegradable mat and erosion control fabric.
- C. Seeding shall be completed between Oct. 1 and Dec. 1, or as otherwise approved by the Project Manager.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Materials not conforming to these Specifications and requirements shall remain the property of Contractor and shall be removed from Project site at no additional cost to the Project Manager.

2.2 SEED

A. Seed – General

1. Seed shall be applied as indicated in the Drawings and/or SWPPP.
2. All seed shall be provided by the Contractor at the proportions presented on the Drawings.
3. Legume seed shall be pellet-inoculated as provided in bulletin AXT-280 of the University of California Cooperative Extension, “Pellet Inoculation of Legume Seed.”
4. Inoculum sources shall be species-specific and shall be applied at a rate of two (2) pounds of inoculum per one hundred (100) pounds of seeds.
 - a. Legume seed shall be sown within ninety (90) calendar days after inoculation or shall be re-inoculated prior to sowing.
 - b. Inoculated legume seed shall have a calcium carbonate coating.

B. Seed

1. Seed shall be a fresh, clean, new crop mixed by dealer and packaged in dealer's unopened container with original label. Containers opened prior to inspection or without a label or tag will not be accepted. Each seed bag shall be delivered to Project site sealed and clearly marked as to the species, purity, percent germination, weed seed, inert material, dealer's guarantee, and date of test.

2. All Contractor-provided seed shall comply with the California Seed Law. Commercially obtained seed shall be labeled under the California Food and Agricultural Code, and by the vendors supplying the seed. The percent of weed seed shall not exceed 1.5 percent by weight of the total seed mixture.
3. Contractor-provided seed shall have been tested for purity and germination not more than fifteen (15) months prior to the application of the seed.
4. Seeds shall be obtained from regionally appropriate sources. Seed collected from within coastal Humboldt County is preferable and seed from alternative coastal sources between San Francisco Bay and Coos Bay will be subject to the Project Manager's approval. Contractor shall coordinate with the Project Manager thirty (30) working days prior to seeding to obtain these approvals. Seed may be available from Pacific Coast Seed, 533 Hawthorn Place, Livermore, CA (925) 373-4417; Hedgerow Farms, 21740 County Road 88, Winters, CA (530) 662- 6847; S & S Seeds, P.O. Box 1275 Carpinteria, CA (805) 684-0436; Larner Seeds, 235 Grove Rd, Bolinas, CA (415) 868-9407; Sunmark Seeds, 18032 NE Airport Way, Portland, OR (888) 214-7333; or approved equal.

2.3 WATER

- A. Water shall be non-saline, suitable for agricultural use, shall be free of harmful substances that would adversely affect plant growth or vigor.

2.4 TACKIFIER

- A. Tackifier shall be non-asphaltic, non-toxic to plants and wildlife, and non-staining to rock surfaces. Tackifier shall be in powder form, may be re-emulsifiable, and shall be a processed organic adhesive derivative of *Plantago insularis* (per ASTM D7047-04) used as a soil binder, manufactured to be suitable for seeding applications.

2.5 FIBER

- A. Fiber material shall be wood cellulose fiber containing no growth or germination-inhibiting factors. Natural wood cellulose fiber shall have the property of dispersing readily in water and shall have no toxic effect when combined with other material. The homogenous slurry or mixture shall be capable of application with power spray equipment. A green colored dye which is non-injurious to seed growth shall be used. Wood cellulose fiber shall be packaged in new label containers marked by the manufacturer to show the air-dry weight content.

2.6 BROADCAST SEEDING EQUIPMENT

- A. An all-terrain vehicle (ATV) / tractor mounted or pulled broadcast spreader or "belly grinder" manual type seeder, or approved equal, shall be used to broadcast seed.

PART 3 - EXECUTION

3.1 FIELD QUALITY CONTROL

- A. Contractor shall request and receive approval from the Project Manager prior to commencing soil preparation, seeding, and mulching work.
- B. Contractor shall inspect Project site and become familiar with any access requirements, access restrictions, and any other site conditions.
- C. Contractor shall notify the Project Manager, in writing, of soil conditions encountered that Contractor considers detrimental to the growth of plant material.

1. When detrimental conditions are uncovered, planting shall be discontinued until instructions to resolve these conditions are received from the Project Manager.
- D. Work described in this section shall not be performed during muddy or frozen conditions.
- E. Contractor shall coordinate with the Project Manager to schedule inspections at the following stages.
1. Inspection during soil preparation.
 2. Acceptance of soil preparation.
 3. Inspection during seeding and mulching.
 4. Acceptance of seeding and mulching.
 5. Acceptance of SWPPP Notice of Termination (NOT) per Section 31 25 13 Erosion Controls and these specifications.
- F. Progress inspections: In addition to the inspections specified, the Project Manager may make periodic progress inspections.
- G. The Project Manager reserves the right to take and analyze samples of materials for conformity to these Specifications at any time.

3.2 SOIL PREPARATION

- A. Timing
1. Work in this section shall not commence until:
 - a. All earthwork has been completed and approved per 31 05 13 Soils for Earthwork.
 - b. Contractor has requested and received approval from the Project Manager.
- B. Layout
1. Soil preparation shall occur in all areas to be seeded as shown on the Plans, and any additional areas disturbed by construction (including non-paved access, staging, stockpiling, and haul routes necessary to access sediment application areas) to be seeded as specified herein.
 2. Contractor shall coordinate with the Project Manager to confirm the limits of soil preparation.
- C. Soil Preparation
1. Contractor shall review soil preparation areas for presence of rock, debris, chemicals, or other harmful substances and notify the Project Manager if such conditions are observed.
 2. Contractor shall prepare the soil as follows in areas to be seeded:
 - a. Scarify mechanically to a depth of two (2) inches using a harrow, lightweight ring-roller/cultipacker or by hand methods, and as approved by the Project Manager.
 - b. In areas where excessive compaction has occurred such as haul routes and staging areas, at the discretion of the Project Manager, the Contractor shall disk, till, or rip to a depth of twelve (12) inches and then smooth with a cultipacker, harrow, or track-walk. In sloped areas, equipment track marks shall be oriented parallel to slope contours and shall have a relative compaction less than ninety (90) percent.
 - c. Contractor shall protect Work from ruts and compaction until seeding occurs per Sub-Section Broadcast Seeding.

3.3 BROADCAST SEEDING

- A. General
1. Contractor may propose hydroseeding application as an alternative to broadcast seeding. Areas and methods shall be submitted and are subject to Project Manager's approval.

2. Contractor may propose drill seed application as an alternative to broadcast seeding. Areas and methods shall be submitted and are subject to Project Manager's approval.

B. Timing

1. Seeding shall occur upon completion of soil preparation work and upon request and receipt of approval by the Project Manager.
2. Seed shall be applied before the onset of winter rains.
3. Seeding shall be completed between Oct. 1 and Dec. 1, unless otherwise approved by the Project Manager.
4. Contractor shall coordinate seed delivery from supplier no less than five (5) working days prior to application. Contractor shall keep all seed in a cool, dry, shaded place until utilized.
5. Contractor shall coordinate with the Project Manager no less than five (5) working days prior to seeding so that the Project Manager can be present during seed application.
6. Work shall be performed only at times when weather conditions at Project site are favorable. No Work shall be performed when wind conditions prohibit uniform distribution of seed unless approved by the Project Manager. No Work shall be performed and no equipment shall be operated when soils are saturated.

C. Layout

1. Seed shall be applied in accordance to the areas shown on Plans and any additional areas impacted by construction; including unpaved access, staging, stockpiling, and haul routes necessary to access to sediment application areas.
2. Contractor shall flag all seeding areas and the Project Manager shall approve all areas to be seeded prior to seeding.
3. Contractor shall limit foot and equipment traffic and storage of supplies in seeded areas.

D. Preparation of Seeding Areas

1. Soil preparation within seeding areas shall occur prior to broadcast seeding per Sub-Section 3.02 Soil Preparation.
2. Clear all areas to be seeded of substantial debris and any other impediments to seed-soil contact.

E. Seed Application

1. Seed shall be delivered to the Project site in unopened separate containers with the seed tag attached. Containers without a seed tag attached will not be accepted.
2. Limit foot traffic or storage of supplies in seeded areas.
3. Apply the seed mix evenly and at the rates specified in the tables in Sub-Section Seed.
4. Any remaining seed shall be applied evenly to the areas shown on the Plans.
5. Contractor shall use appropriate equipment such as a rake or light harrow immediately after application to lightly to cover seed with 1/8-inch to ¼-inch layer of soil. Seed cover shall not exceed ¼ inch.
6. After the site has been seeded, wood-fiber mulch shall be hydraulically applied per sub-Section Hydro-Mulch Application.

3.4 HYDRO-MULCH APPLICATION

A. General

1. Contractor may propose blown straw application as an alternative to wood-fiber hydro-mulch. Areas and methods shall be submitted to and are subject to Project Manager approval.

- B. Timing: Hydro-mulch shall be applied within the same day following approval of seeding
- C. Layout:
 - 1. Hydro-mulch shall be applied to all seeded areas.
- D. Hydro-mulch shall be applied as follows:
 - 1. Hydro-mulch shall be applied using a mechanical pump and spray equipment capable of applying the hydro-slurry at the rates as defined in these specifications.
 - 2. Hydro-mulch shall be applied uniformly.
- E. Hydro-mulch slurry shall contain the following components and minimum rates:
 - 1. Commercially available, weed-free, hydro-wood fiber mulch at a rate of 2,000 lbs/acre.
 - 2. Green dyed cellulose fiber mulch at a rate of 500 lbs/acre (unless included in wood fiber mulch).
 - 3. Organic tackifier at a rate of 125 lbs/acre.
 - 4. Clean water at a rate so that an adequate slurry is comprised for hydraulic application.

3.5 FORCE GERMINATION OF SEED

- A. At the Contractor's discretion, force germination of seed may be performed to comply with the Project's SWPPP requirements per Section 31 25 13 Erosion Controls. The following specifications shall apply to any force germination of seed.
- B. Timing and Duration
 - 1. Contractor shall commence force germination of seed following completion of broadcast seeding, straw, tackifier application, biodegradable mat installation, and erosion control blanket, and acceptance of this work by the Project Manager.
- C. Water Supply
 - 1. Contractor shall coordinate with water source provider per Section 01 50 00 Temporary Facilities and Controls.
- D. Application Method
 - 1. Water shall be applied to the seeded areas using either a temporary on-grade spray irrigation system sufficient to provide an even precipitation rate of 0.25 inches of water to all areas at a frequency of one event every three (3) days, a water truck or as otherwise approved by the Project Manager.
 - a. Contractor shall provide and install impact rotors in a quantity to cover seeded areas and sufficient to meet the specified precipitation rate.
 - b. Prior to broadcast seed application, Contractor shall meet the Project Manager onsite to determine the layout of the rotors. Following this meeting, Contractor shall submit a shop drawing showing the layout of all irrigation equipment, piping, and points of connection, as well as flow and demand calculations, for approval by the Project Manager prior to installation of the system.
 - c. Contractor shall prevent runoff during irrigation. Any runoff or bank erosion resulting from force germination that does occur shall be repaired to the design grade and reseeded per these specifications at no additional cost to the Project Manager.
 - 2. Watering should occur 120 days following seeding. Watering may be suspended after rainstorms for 3 days.
- E. System Removal

1. Unless otherwise directed by the Project Manager, Contractor shall remove all components of the temporary irrigation system following completion of force germination and acceptance of work.

3.6 SITE CLEANUP

- A. Contractor shall cleanup following soil preparation, seeding, and mulching activities as follows and as directed by the Project Manager:
 1. Remove all containers, packaging, and other debris resulting from seeding operations.
 2. Dispose of all debris legally at licensed disposal facilities.
 3. Clean all surfaces not designated for treatment and remove all residues resulting from mixing, applying, or equipment flushing.
 4. Remove temporary items.
- B. Seeded or mulched areas disturbed by subsequent construction activities shall be re-seeded or re-mulched within five (5) working days of the completion of such activities.

3.7 ACCEPTANCE OF SEEDING

- A. Acceptance of Work:
 1. The Project Manager will accept work when all improvements and corrective work have been performed as specified and to the satisfaction of the Project Manager, and the following has been achieved:
 - a. Final stabilization as defined by the SWPPP and acceptance of the Notice of Termination (NOT) by the State Water Resources Control Board and in accordance to Section 31 25 13 Erosion Controls.

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DIVISION 33

UTILITIES

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SECTION 33 11 16 - SITE WATER UTILITY DISTRIBUTION PIPING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Pipe and fittings for site water line including domestic water line, and fire water line
 2. Valves.
 3. Backflow preventers.
 4. Underground pipe markers.
 5. Bedding and cover materials.
- B. Unless otherwise noted, the Contractor shall provide all materials, equipment, and labor necessary to produce finished Work as shown on the Drawings and as specified herein.
- C. Related Requirements:
1. Section 03 30 00 - Cast-In-Place Concrete: Concrete for thrust restraints.
 2. Section 31 05 13 - Soils for Earthwork: Soils for backfill in trenches.
 3. Section 31 05 16 - Aggregates for Earthwork: Aggregate for backfill in trenches.
 4. Section 31 23 16 - Excavation: Product and execution requirements for excavation and backfill required by this section.
 5. Section 31 23 17 - Trenching: Execution requirements for trenching required by this section.
 6. Section 31 23 23 - Fill: Requirements for backfill to be placed by this section.
 7. Section 32 13 13 - Concrete Paving

1.2 REFERENCE STANDARDS

- A. American Association of State Highway and Transportation Officials:
1. AASHTO T180 - Standard Specification for Moisture-Density Relations of Soils Using a 10-lb Rammer and a 18-in. Drop.
- B. American Society of Sanitary Engineering:
1. ASSE 1012 - Backflow Preventer with Intermediate Atmospheric Vent.
 2. ASSE 1013 - Reduced Pressure Principle Backflow Preventers.
- C. ASTM International:
1. ASTM A48/A48M - Standard Specification for Gray Iron Castings.
 2. ASTM B88 - Standard Specification for Seamless Copper Water Tube.
 3. ASTM C858 - Standard Specification for Underground Precast Concrete Utility Structures.
 4. ASTM D698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³).
 5. ASTM D1785 - Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds.
 6. ASTM D2466 - Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40.
 7. ASTM D2855 - Standard Practice for Making Solvent-Cemented Joints with Poly (Vinyl Chloride) (PVC) Pipe and Fittings.

- 8. ASTM D2922 - Standard Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
 - 9. ASTM D3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).
 - 10. ASTM D3139 - Standard Specification for Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals.
- D. American Society of Mechanical Engineers:
 - 1. ASME B16 – Standards of Pipes and Fittings
 - E. American Welding Society:
 - 1. AWS A5.8/A5.8M – Specification for Filler Metals for Brazing and Braze Welding.
 - F. American Water Works Association:
 - 1. AWWA C508 - Swing-Check Valves for Waterworks Service, 2 in. (50 mm) Through 24 in. (600 mm) NPS.
 - 2. AWWA C509 - Resilient-Seated Gate Valves for Water-Supply Service.
 - 3. AWWA C900 - Polyvinyl Chloride (PVC) Pressure Pipe, 4 in. through 12 in., for Water Distribution.
 - G. Underwriters Laboratories Inc.:
 - 1. UL 246 - Hydrants for Fire - Protection Service.
- 1.3 SUBMITTALS
- A. Product Data: Submit data on pipe materials, pipe fittings, valves and accessories.
- 1.4 CLOSEOUT SUBMITTALS
- A. Project Record Documents: Record actual locations of piping mains, valves, connections, thrust restraints, and invert elevations.
 - B. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.
- 1.5 QUALITY ASSURANCE
- A. Valves: Manufacturer's name and pressure rating marked on valve body.
 - B. Perform Work in accordance with California Waterworks Standards.
- 1.6 DELIVERY, STORAGE, AND HANDLING
- A. Deliver and store valves in shipping containers with labeling in place.

PART 2 - PRODUCTS

2.1 WATER PIPING

- A. Copper Tubing: ASTM B88, Type K, annealed:
 - 1. Fittings: ASME B16.18, cast copper, or ASME B16.22, wrought copper.
 - 2. Joints: Compression connection or AWS A5.8, BCuP silver braze.

- B. PVC Pipe: Schedule 40, SDR-26 for 160 psig pressure rating:
 - 1. Fittings: ASTM D2466, PVC.
 - 2. Joints: ASTM D2855, solvent weld.
- C. PVC Pipe: AWWA C900 Class 125:
 - 1. Fittings: AWWA C111, cast iron.
 - 2. Joints: ASTM D3139 compression gasket ring.

2.2 GATE VALVES

- A. 2-1/2 inches and Smaller: Brass or Bronze body, non-rising stem, inside screw, single wedge or disc, IPS ends, with control rod, extension box.
- B. 3 inches and Larger: AWWA C509, Iron body, bronze trim, non-rising stem with square nut, single wedge, resilient seat, flanged or mechanical joint ends, control rod, extension box.

2.3 BALL VALVES

- A. 2 inches and Smaller: Brass body, teflon coated brass ball, rubber seats and stem seals, Tee stem pre-drilled for control rod, IPS inlet end, IPS outlet.

2.4 SWING CHECK VALVES

- A. 2 inches to 24 inches: AWWA C508, iron body, bronze trim, renewable disc and seat, flanged ends per California Waterworks Standards.

2.5 SERVICE SADDLES

- A. Manufacturers:
 - 1. Smith-Blair Series 317, 357, or 393
 - 2. Romac Style 101N, 202N, 101 BS or 202BS
 - 3. Mueller DR2A series
 - 4. Substitutions: Section 01 60 00 - Product Requirements.
- B. Materials:
 - 1. Double strap type, with bodies cast of either epoxy-coated ductile iron or bronze, designed to hold pressures in excess pipe working pressure.
 - 2. Taps shall have Iron Pipe threads.
 - 3. Service saddles shall be equipped with nylon bushings where connecting to copper pipe.
- C. Pressure Rating: 500 psi minimum

2.6 BACKFLOW PREVENTERS

- A. Furnish materials in accordance with California Waterworks Standards.
- B. Reduced Pressure Backflow Preventers:
 - 1. Comply with ASSE 1013.
 - 2. Bronze body, with bronze internal parts and stainless steel springs.
 - 3. Two independently operating, spring loaded check valves; diaphragm type differential pressure relief valve located between check valves; third check valve opening under back pressure in case of diaphragm failure; non-threaded vent outlet; assembled with two gate valves, strainer, and four test cocks.

2.7 FOUNTAINS AND BOTTLE FILLING STATION(S)

- A. Furnish materials in accordance with California Waterworks Standards & CBC for Accessible Drinking Fountains
- B. Bottle Filling Stations
 - 1. Elkay Outdoor ezH2O Bottle Filling Station Bi-Level Pedestal or equivalent
 - 2. Mounting hardware as specified by the manufacturer
 - 3. 316 Stainless Steel Hardware or equivalent

2.8 UNDERGROUND PIPE MARKERS

- A. Plastic Ribbon Tape: Bright colored, continuously printed, minimum 4 inches wide by 4 mil thick, manufactured for direct burial service.
- B. Tracer Wire: Electronic detection materials for non-conductive piping products.
 - 1. Unshielded 10 gage THWN insulated copper wire.
 - 2. Conductive tape.

2.9 BEDDING AND COVER MATERIALS

- A. Bedding: Aggregate as specified in Section 32 11 23.
- B. Soil Backfill from Above Pipe to Finish Grade: Soil Type Select Fill, as specified in Section 31 05 13.

2.10 ACCESSORIES

- A. Concrete for Thrust Restraints: Concrete type specified in Section 03 30 00.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify building service connection and municipal utility water main size, location, and invert are as indicated on Drawings.

3.2 PREPARATION

- A. Cut pipe ends square, ream pipe and tube ends to full pipe diameter, remove burrs.
- B. Remove scale and dirt on inside and outside before assembly.
- C. Prepare pipe connections to equipment with flanges or unions.

3.3 BEDDING

- A. Excavate pipe trench in accordance with Section 31 23 17 for Work of this Section.
- B. Form and place concrete for pipe thrust restraints at change of pipe direction. Place concrete to permit full access to pipe and pipe accessories. Provide thrust restraint bearing on subsoil per drawings.
- C. Place bedding material at trench bottom, level fill materials in one continuous layer not exceeding 6 inches depth.
- D. Backfill around sides and to top of pipe with cover fill, tamp in place and compact to 95 percent.
- E. Maintain optimum moisture content of fill material to attain required compaction density.

3.4 INSTALLATION - PIPE

- A. Group piping with other site piping work whenever practical.
- B. Install pipe to indicated elevation to within tolerance of 5/8 inch.
- C. Install ductile iron fittings to AWWA C600.
- D. Route pipe in straight line.
- E. Install pipe to allow for expansion and contraction without stressing pipe or joints.
- F. Install access fittings to permit disinfection of water system.
- G. Form and place concrete for thrust restraints at each elbow or change of direction of pipe main.
- H. Establish elevations of buried piping with not less than 3 ft of cover.
- I. Install plastic ribbon tape continuous buried 12 inches below finish grade, above pipe line; coordinate with Section 31 23 23
- J. Install trace wire continuous over top of pipe, above pipe line.

3.5 INSTALLATION - VALVES AND HYDRANTS

- A. Set valves on solid bearing.
- B. Center and plumb valve box over valve. Set box cover flush with finished grade.
- C. Set hydrants plumb; locate pumper nozzle perpendicular to and facing roadway.
- D. Set hydrants to grade, with nozzles at least 20 inches above ground.
- E. Locate control valve 12 inches away from hydrant.
- F. Install Work in accordance with the California Waterworks Standards.

3.6 INSTALLATION - METERS

- A. Meters to be installed by the Contractor as shown on the plans.

3.7 SERVICE CONNECTIONS

- A. Install water service and fire line in accordance with California Waterworks Standards requirements with reduced pressure backflow preventer, or double check valve backflow preventer with water meter.
- B. Install water meter and backflow preventer above grade.
- C. Install Work in accordance with California Waterworks Standards.

3.8 DISINFECTION OF DOMESTIC WATER PIPING SYSTEM

- A. Flush and disinfect system in accordance with California Waterworks Standards.

3.9 FIELD QUALITY CONTROL

- A. Perform pressure test on domestic site water distribution system in accordance with AWWA C600.
- B. Compaction Testing for Bedding: In accordance with ASTM D698. ASTM D2922. ASTM D3017.
- C. When tests indicate Work does not meet specified requirements, remove Work, replace and retest.
- D. Frequency of Compaction Tests: One test for each 12 inches of fill in each 100 feet of trench.

END OF SECTION

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SECTION 33 13 00 - DISINFECTING OF WATER UTILITY DISTRIBUTION

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes disinfection of potable water distribution system; and testing and reporting results.
- B. Unless otherwise noted, the Contractor shall provide all materials, equipment, and labor necessary to produce finished Work as shown on the Drawings and as specified herein.
- C. Related Sections:
 - 1. Section 33 11 16 – Site Water Utility Distribution Piping

1.2 REFERENCES

- D. American Water Works Association:
 - 1. AWWA B300 - Hypochlorites.
 - 2. AWWA B301 - Liquid Chlorine.
 - 3. AWWA B302 - Ammonium Sulfate.
 - 4. AWWA B303 - Sodium Chlorite.
 - 5. AWWA C600 - Installation of Ductile-Iron Water Mains and Their Appurtenances.
 - 6. AWWA C651 - Disinfecting Water Mains.
- E. California Waterworks Standards
- F. Water Pollution Control Federation and other applicable standard methods for the Examination of Water and Wastewater.

1.3 SUBMITTALS

- G. Name and experience of competent person(s) responsible for the disinfection process and performing the required bacteriological sampling. Engineer shall approve in advance.
- H. Product Data: Submit procedures, proposed chemicals, and treatment levels for review.
- I. Test Reports: Indicate results comparative to specified requirements.
- J. Certified results for all bacterial sampling prior to restoring or placing the distribution system into service.
- K. Contractor shall submit a Disinfection Plan and Schedule for approval by the Engineer a minimum of fourteen (14) calendar days in advance of the planned performance of the Work. Plan shall detail proposed disinfection procedures including injection and sampling points, proposed chemical and amounts, proposed hold time, proposed sectioning of the system, proposed water disposal and de-chlorination procedure.

1.4 CLOSEOUT SUBMITTALS

- A. Disinfection Report:
 - 1. Type and form of disinfectant used.
 - 2. Date and time of disinfectant injection start and time of completion.
 - 3. Test locations.
 - 4. Name of person collecting samples.
 - 5. Initial and 24 hour disinfectant residuals in treated water in ppm for each outlet tested.
 - 6. Date and time of flushing start and completion.
 - 7. Disinfectant residual after flushing in ppm for each outlet tested.

- B. Bacteriological Report:
1. Date issued, project name, and testing laboratory name, address, and telephone number.
 2. Time and date of water sample collection.
 3. Name of person collecting samples.
 4. Test locations.
 5. Initial and 24 hour disinfectant residuals in ppm for each outlet tested.
 6. Coliform bacteria test results for each outlet tested.
 7. Certify water conforms, or fails to conform, to bacterial standards of California Department of Public Health.

1.5 QUALITY ASSURANCE

- A. Perform Work in accordance with AWWA C651.

1.6 QUALIFICATIONS

- A. Testing Firm: Company specializing in testing potable water systems, certified by State of California.
- B. The competent person(s) responsible for disinfection processes and bacteriological testing shall be familiar with AWWA C651.
- C. The Engineer shall approve Disinfection Plan and Schedule prior to implementation.
- D. Submit bacteriologist's signature and authority associated with testing.
- E. The Engineer shall observe disinfection and bacteriological sampling procedures.

PART 2 PRODUCTS

2.1 DISINFECTION CHEMICALS

- A. Chemicals: AWWA B300, Hypochlorite, AWWA B301, Liquid Chlorine, AWWA B302, Ammonium Sulfate, and AWWA B303, Sodium Chlorite.
- B. Material Safety Data Sheets (MSDS) of any chemicals used shall be available on site.
- C. Competent person(s) responsible for the disinfection process shall be fully trained in the first aid requirements and procedures to address exposure to chemicals.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verification of existing conditions before starting work.
- B. Verify piping system has been cleaned, inspected, and pressure tested.
- C. Perform scheduling and disinfecting activity with start-up, water pressure testing, adjusting and balancing, demonstration procedures, including coordination with related systems.

3.2 DISINFECTION

- A. Before being placed into service, all new water pipelines shall be chlorinated using the Continuous Feed Method specified in AWWA C651. The Engineer shall approve the procedure in advance.
 - 1. The Contractor will determine the location of the chlorination and sampling points in the field. The Contractor shall install taps for chlorinating, sampling and expulsion of air and shall uncover, backfill and plug the taps as required.
 - 2. Prior to disinfecting the water main, the main shall be completely filled to remove all air pockets and then flushed to remove particulate. The flushing velocity in the main shall not be less than 2.5 feet per second unless the Engineer and/or Owner determine that the conditions do not permit the required flow to be discharged to waste.
 - 3. Required Flow to Flush Pipelines (40 PSI Residual Pressure in Water Main)*

Pipe Diameter (in)	Flow Required to Produce 2.5 ft/s (Approximate Velocity in Main)
4	100 gpm
6	200 gpm
8	400 gpm
10	600 gpm
12	900 gpm
16	1600 gpm

*AWWA C651, AWWA Standard for Disinfecting Water Mains

- 4. At a point not more than 10 feet downstream from the beginning of the new main, water entering a new main shall receive a dose of chlorine fed at a constant rate such that the water will not have less than 25 mg/L (PPM) free chlorine throughout the entire section of pipe to be chlorinated.
- 5. Chlorine Required to Produce 25-mg/L Concentration in 100 Feet of Pipe-by Diameter*

Pipe Diameter (in)	100% Chlorine (lbs)	1% Chlorine Solution (gals)
4	0.0130	0.16
6	0.0300	0.36
8	0.0540	0.65
10	0.0850	1.02
12	0.1200	1.44
16	0.2170	2.60

*AWWA C651, AWWA Standard for Disinfecting Water Mains

- 6. The chlorinated water is to remain in the new pipeline for at least 24-hours. After a contact time of 24-hours there should be a free chlorine concentration of not less than 10 mg/L (PPM). During this period, proper precautions are to be taken to prevent this chlorinated water from flowing back into the existing system.
 - 7. All valves and hydrants within the treated section shall be operated to ensure disinfection of the appurtenances.
- B. The Tablet Method consisting of placing calcium hypochlorite granules or tablets in the water main as it is being installed and then filling the main with potable water and allowing it to set for a contact period is not acceptable.
 - C. The interior of all pipe, fittings, and valves used in making a repair or tie-in shall be swabbed or sprayed with a one percent (1%) hypochlorite solution before they are installed.

3.3 FINAL FLUSHING

- A. Following the chlorination period, all treated water shall be flushed from the lines at their extremities and replaced with water from the distribution system.
 - 1. Flushing the main is to be accomplished at as high a velocity as possible consistent with the ability of the Contractor to collect the discharge water for proper disposal.
 - 2. All treated water flushed from the lines shall be disposed of by discharging to the nearest sanitary sewer or by other approved means provide in AWWA C651.
 - 3. Flushing shall be done in strict conformance with all applicable local, state, and federal regulations. No discharge to any storm sewer or natural watercourse will be allowed.
- B. The discharge of chlorinated water will be harmful to vegetation and wildlife. Measures must be taken to impound the highly chlorinated water or to neutralize the chlorine prior to discharge of the water.
- C. Federal, state and local environmental regulations may require special provisions or permits prior to the disposal of chlorinated water.
- D. Coordinate disposal of chlorinated water with the Owner. Legally dispose of chlorinated water in accordance with regulatory agency requirements.
- E. Neutralize the chlorine residual of the water being disposed with one of the chemicals listed below:
 - 1. Sodium Thiosulfate
 - 2. Sodium Bisulite
 - 3. Sodium Metabisulfite
 - 4. Sodium Sulfite

3.4 BACTERIOLOGICAL ANALYSES

- A. After the 24-hour disinfection period and all chlorine solution has been thoroughly flushed, the bacteriological sampling and analysis of the replacement water may then be performed.
 - 1. Bacteriological sampling shall be made by the Contractor's competent person(s) in full accordance with AWWA C651 – Section 7, Bacteriological Tests and under the supervision of the Engineer.
 - 2. Analysis shall be performed by an independent commercial laboratory certified by the State Department of Environmental Protection and US Environmental Protection Agency for analyzing public drinking water supplies. All results shall be provided to the Engineer for review.
 - 3. Two consecutive sets of acceptable samples, taken at least 24-hours apart are required prior to placing the main into service. Failure of any one of the bacteriological test samples shall require re-chlorination and retesting by the Contractor.
 - 4. The line shall not be placed in service until the bacteriological requirements of AWWA C651 are met.

END OF SECTION

SECTION 33 41 00 - STORM UTILITY DRAINAGE PIPING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Storm drainage piping.
2. Accessories.
3. Underground pipe markers.
4. Plant area drains.
5. Cleanouts.
6. Bedding and cover materials.

B. Unless otherwise noted, the Contractor shall provide all materials, equipment, and labor necessary to produce finished Work as shown on the Drawings and as specified herein.

C. Related Sections:

1. Section 03 30 00 - Cast-In-Place Concrete
2. Section 31 05 13 - Soils for Earthwork
3. Section 31 05 16 - Aggregates for Earthwork
4. Section 31 23 16 - Excavation
5. Section 31 23 17 - Trenching
6. Section 31 23 23 - Fill
7. Section 33 05 13 - Manholes and Structures
8. Section 33 46 00 - Sub-drainage
9. Section 32 13 13 - Concrete Paving

1.2 REFERENCES

A. American Association of State Highway and Transportation Officials:

1. AASHTO M170 - Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe.
2. AASHTO M294 - Standard Specification for Corrugated Polyethylene Pipe, 12- to 60-in Diameter.

B. ASTM International:

1. ASTM A48 - Standard Specification for Gray Iron Castings
2. ASTM C76 - Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe.
3. ASTM C443 - Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets
4. ASTM C497 - Standard Test Methods for Concrete Pipe, Manhole Sections, or Tile
5. ASTM C564 - Standard Specification for Rubber Gaskets for Cast Iron Soil Pipe and Fittings.
6. ASTM C924 - Standard Practice for Testing Concrete Pipe Sewer Lines by Low-Pressure Air Test Method.
7. ASTM C1103 - Standard Practice for Joint Acceptance Testing of Installed Precast Concrete Pipe Sewer Lines.
8. ASTM C1479 - Standard Practice for Installation of Precast Concrete Sewer, Storm Drain, and Culvert Pipe Using Standard Installations.

9. ASTM D2564 - Standard Specification for Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Piping Systems.
10. ASTM D2729 - Standard Specification for Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
11. ASTM D2855 - Standard Practice for Making Solvent-Cemented Joints with Poly (Vinyl Chloride) (PVC) Pipe and Fittings.
12. ASTM D3034 - Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
13. ASTM F477 - Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.
14. ASTM F679 Standard Specification for Poly (Vinyl Chloride) (PVC) Large Diameter Plastic Gravity Sewer Pipe and Fittings.

1.3 SUBMITTALS

- A. Product Data: Submit data indicating pipe material used, and pipe accessories.
- B. Manufacturer's Installation Instructions: Indicate special procedures required to install Products specified.
- C. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.4 CLOSEOUT SUBMITTALS

- A. Project Record Documents:
 1. Record location of pipe runs, connections, manholes, cleanouts, and invert elevations.
 2. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

1.5 QUALITY ASSURANCE

- A. Perform Work in accordance with these specifications.
- B. Maintain one copy of approved construction documents and each permit on site at all times.

1.6 COORDINATION

- A. Coordinate the Work with termination of storm sewer connection outside building, connection to municipal sewer utility service, and trenching.
- B. Coordinate the Work with termination of storm sewer connection outside building, trenching, connection to foundation drainage system, pervious paver sub-drain system, bio retention sub-drain system, and municipal storm sewer utility service.

PART 2 – PRODUCTS

2.1 STORM DRAINAGE PIPING

- A. Reinforced Concrete Pipe (RCP):
 1. Standard Specifications – Section 65.
 2. Reinforced Concrete Pipe: ASTM C76:
 3. Type II Portland Cement: ASTM C150.
 4. Pipe Class: III, IV or V per Drawings.
 5. Bell and spigot ends.
 6. Fittings: Reinforced concrete.
 7. Joints: ASTM C443, rubber compression gasket.

- B. HDPE Plastic Pipe:
 - 1. Standard Specifications – Section 64.
 - 2. AASHTO M294, high-density polyethylene (HDPE) material.
 - 3. ASTM F2306.
 - 4. Type S: Corrugated exterior, smooth interior.
 - 5. Bell and spigot solvent sealed ends.
 - 6. Fittings: HDPE.
 - 7. Joints: ASTM F477, elastomeric gaskets.

- C. PVC Plastic Pipe:
 - 1. ASTM D3034, SDR 35 (4" to 15") or ASTM F679 PS46 (18" to 27"), Polyvinylchloride (PVC) material.
 - 2. Bell and spigot style rubber ring sealed gasket joint.
 - 3. Fittings: PVC.
 - 4. Joints: ASTM F477, elastomeric gaskets.

- D. Perforated Plastic Pipe
 - 1. Pipe Material:
 - 1) Standard Specifications – Section 68-2.02D.
 - 2) AASHTO M278, smooth wall PVC material.
 - 3) ASTM D3034, SDR 35, Poly (Vinyl Chloride) (PVC) material.
 - 2. Bell and spigot style rubber ring sealed gasket joint.
 - 3. Fittings: PVC.
 - 4. Joints: ASTM F477, elastomeric gaskets.
 - 5. Perforations: as indicated on Drawings.

2.2 ACCESSORIES

- A. Pipe Joints: Mechanical clamp ring type, stainless steel expanding and contracting sleeve, neoprene-ribbed gasket for positive seal.
- B. Fittings: Same material as pipe molded or formed to suit pipe size and end design, in required tee, bends, elbows, cleanouts, reducers, traps and other configurations required.
- C. Trace Wire: Magnetic detectable conductor, brightly colored plastic covering, imprinted with "Storm Drainage Service."

2.3 PRECAST CATCH BASINS

- A. Precast Concrete Catch Basins: Refer to Section 33 05 13.

2.4 BEDDING, PIPE ZONE AND BACKFILL MATERIALS

- A. Pipe Bedding and Pipe Zone: Fine Aggregate Type A6, per Section 31 05 16.
- B. Backfill: Coarse Aggregate Type A3, per Section 31 05 16

2.5 TRENCH DRAIN

- A. 6" wide PolyDrain Trench Drain System, manufactured by ABT, Inc. with self sloping channel, and bolt down ductile iron grating (load class E and accessible grating) and anchor frame.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify trench cut and excavation base is ready to receive work and excavations, dimensions, and elevations are as indicated on Drawings.

3.2 PREPARATION

- A. Correct over excavation in accordance with Section 31 23 17 Trenching.
- B. Remove large stones or other hard matter which could damage piping or impede consistent backfilling or compaction.

3.3 BEDDING

- A. Excavate pipe trench in accordance with Section 31 23 17 for work of this Section. Hand trim excavation for accurate placement of pipe to elevations indicated.
- B. Place bedding material at trench bottom, level materials in continuous layer not exceeding 6 inches compacted depth.
- C. Maintain optimum moisture content of bedding material to attain required compaction density.

3.4 INSTALLATION - PIPE

- A. Install pipe, fittings, and accessories in accordance with manufacturer's recommendations. Seal joints watertight.
- B. Lay pipe to slope gradients noted on drawings with maximum variation from indicated slope of 1/8 inch in 10 feet.
- C. Do not displace or damage pipe when compacting.
- D. Install trace wire continuous over the pipe centerline and on top of the pipe zone material. Support pipe on compacted bedding material. Excavate bell holes only large enough to properly make the joint.
- E. Refer to Section 31 23 23 for backfilling and compacting requirements. Do not displace or damage pipe when compacting.
- F. Refer to Section 33 05 13 for manhole requirements.
- G. Connect to sub-drainage system piping. Refer to Section 33 46 00.
- H. Install site storm drainage system piping to 5 feet of building.

3.5 INSTALLATION – BUILDING SERVICE LINE

- A. Install storm service lines to point of connection within approximately 5 feet outside of buildings where service is required and make connections. Coordinate the invert and location of the service line with the Contractor installing the building lines.
- B. Connections of service line to building piping shall be made after the new storm system has been constructed, tested, and accepted for operation by the Engineer. The Contractor shall install all temporary caps or plugs required for testing.
- C. When building services have not been installed at the time when the storm system is complete, provide temporary plugs or caps at the ends of all service lines. Mark the location and depth of the service lines with continuous warning tape placed 12 inches above service lines.

3.6 INSTALLATION - CATCH BASINS AND CLEANOUTS

- A. Form bottom of excavation clean and smooth to correct elevation.
- B. Form and place Cast-In-Place Concrete base pad, with provision for storm sewer pipe end sections.
- C. Level top surface of base pad; sleeve concrete shaft sections to receive storm sewer pipe sections.
- D. Establish elevations and pipe inverts for inlets and outlets as indicated on Drawings.
- E. Mount lid and frame level in grout, secured to top cone section to elevation indicated.

3.7 INSTALLATION – CLEANOUT

- A. 6 inches in diameter and consisting of a ductile iron 45 degree fitting on end of run, or combination Y fitting and 1/8 bend in the run with ductile iron pipe extension, water tight plug or cap and cast frame and cover flush with finished grade. Center set cleanouts, located in unpaved areas, in a 12 by 12 by 6 inches thick concrete slab set flush with adjacent finished grade. Where cleanout is in force main, provide a blind flange top connection. The center of the flange shall be equipped with a 2 inches base valve to allow the pressure in the line to be relieved prior to removal of the blind flange. Frames and covers for pressure (force) mains shall be 24 inches in diameter.
- B. The top of the cleanout assembly shall be 2 inches below the bottom of the cover to prevent loads being transferred from the frame and cover to the piping.

3.8 ABANDONED MANHOLES, STRUCTURES, AND PIPING

- A. Manholes and Structures Outside of Building Areas: Remove frame and cover, cut and remove the top of an elevation of 3 feet below finished grade. Fill the remaining portion with compacted gravel or crushed rock or concrete.
- B. Manholes and Structures with Building Areas: Remove frame and cover and remove the entire structure and the base.
- C. Piping under and within 5 feet of building areas shall be completely removed.
- D. Piping outside of building areas shall have all ends of the piping at the limit of the abandonment and within structures and manholes, plugged with concrete and abandoned in-place.
- E. The Contractor shall comply with all OSHA confined space requirements while working within existing manholes and structures.
- F. When the limit of the abandonment terminates in an existing manhole to remain, the flow line in the bench of the manhole to the abandoned line shall be filled with concrete and shaped to maintain the flowline of the lines to remain.

3.9 FIELD QUALITY CONTROL

- A. Perform test on site storm drainage system in accordance with the 2016 California Plumbing Code, Chapter 11, Section 1106.0.
- B. Request inspection prior to and immediately after placing aggregate pipe bedding.
- C. When tests indicate Work does not meet specified requirements, remove Work, replace and retest.

3.10 PROTECTION OF FINISHED WORK

- A. Protect pipe and aggregate cover from damage or displacement until backfilling operation is in progress.
 - 1. Take care not to damage or displace installed pipe and joints during construction of pipe supports, backfilling, testing, and other operations.
 - 2. Repair or replace pipe that is damaged or displaced from construction operations.

END OF SECTION

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SECTION 33 46 00 - SUBDRAINAGE

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Retaining wall drainage system.
 - 2. Bioretention subdrainage system.
 - 3. Filter aggregate.
- B. Unless otherwise noted, the Contractor shall provide all materials, equipment, and labor necessary to produce finished Work as shown on the Drawings and as specified herein.
- C. Related Sections:
 - 1. Section 31 05 13 - Soils for Earthwork.
 - 2. Section 31 05 16 - Aggregates for Earthwork.
 - 3. Section 31 23 16 - Excavation: Excavating for site subdrainage system piping and surrounding filter aggregate.

1.2 REFERENCES

- A. ASTM International:
 - 1. ASTM D2729 - Standard Specification for Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
- B. American Association of State Highway and Transportation Officials:
 - 1. AASHTO M252 - Specification for Corrugated Polyethylene Pipe, 305- to 915-mm (12- to 36-In.) Diameter.

1.3 SUBMITTALS

- A. Shop Drawings: Indicate dimensions, layout of piping, high and low points of pipe inverts, gradient of slope.
- B. Product Data: Submit data on pipe drainage products and pipe accessories.

1.4 CLOSEOUT SUBMITTALS

- A. Project Record Documents: Record location of pipe runs, connections, cleanouts and principal invert elevations.

1.5 QUALITY ASSURANCE

- A. Perform Work in accordance with Caltrans Standard Plans.

PART 2 - PRODUCTS

2.1 PIPE MATERIALS

- A. Polyvinyl Chloride Pipe: ASTM D2729; perforated, size as specified in contract drawings; with required fittings and cap at end of run.
- B. Or
- C. Polyethylene Pipe: AASHTO M252; perforated, size as specified in contract drawings with required fittings and cap at end of run.
 - 1. Joints: Polyethylene sleeve with gasket.

2.2 AGGREGATE AND BEDDING

- A. Filter Aggregate Materials: Aggregate Drain Rock as specified in Section 31 05 16.

2.3 ACCESSORIES

- A. Pipe Coupling: Solid plastic.
- B. Filter Fabric: Water pervious, woven type.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify excavated base is ready to receive work and excavations, dimensions, and elevations are as indicated on Drawings.

3.2 PREPARATION

- A. Hand trim excavations to required elevations. Correct over excavation with select fill.
- B. Remove large stones or other hard matter which could damage drainage piping or impede consistent backfilling or compaction.

3.3 INSTALLATION

- A. Place drainage pipe on clean cut subsoil.
- B. Lay pipe to slope gradients noted on Drawings; with maximum variation from indicated slope of 1/8 inch in 10 feet.
- C. Place pipe with perforations facing down. Mechanically join pipe ends.
- D. Install pipe couplings.
- E. Install aggregate drain rock at sides, over joint and top of pipe to thickness on drawings.
- F. Place aggregate in maximum 12 inch lifts, consolidating each lift.
- G. Connect to catch basins with perforated pipe.

3.4 FIELD QUALITY CONTROL

- A. Request inspection prior to placing aggregate cover over pipe.

3.5 PROTECTION OF INSTALLED CONSTRUCTION

- A. Protect pipe and aggregate cover from damage or displacement until backfilling operation begins.

END OF SECTION

SECTION 33 46 16.13 - FIELD SUBSURFACE DRAINAGE

PART 1 - GENERAL

1.1 SCOPE OF WORK

- A. Furnish and install complete subsurface drainage system for the synthetic turf football / soccer field.
- B. Trench to line and grade as shown on the drawings utilizing laser-controlled equipment.
- C. Dispose of excavated trench material.
- D. Collector Tubing:
 - 1. For non-perforated collector, install corrugated polyethylene (CPEP) collector tubing. Backfill with select site soil, 8" maximum lifts, compacted to 95%.
 - 2. For perforated collector, install corrugated polyethylene (CPEP) collector tubing. Backfill with pea gravel.
- E. Remove all loose material from collector and lateral trench bottom.
- F. For round pipe perforated lateral drainage piping, place a minimum 2" depth of specified washed pea gravel bedding for perforated lateral piping. For flat drainage piping, install perforated lateral piping directly on structural fabric.
- G. Install perforated corrugated tubing lateral system plumbed to collector piping.
- H. Bed and backfill round perforated tubing trenches with specified washed pea gravel. Backfill over corrugated tubing in jump pits with pea gravel.
- I. Upon completion of this work, restore subgrade to specified condition and tolerances, compacted to 95% density with no loose material on surface.
- J. Furnish and install slot drains at field perimeter/inside edge of rubberized running track.

1.2 STANDARD SPECIFICATIONS

- A. American Public Works Association, Standard Specifications for Municipal Public Works Construction (APWA) (latest edition).
- B. United States Department of Agriculture, Soil Conservation Service, Engineering Standard 606.
- C. The Green Book Standard Specifications for Municipal Public Works Construction, California State Chapter (latest edition).

1.3 RELATED WORK IN OTHER SECTIONS

- A. 03 30 53 Miscellaneous Cast-In-Place Concrete
- B. 11 68 24 Exterior Athletic Equipment

1.4 SUBMITTALS

- A. Submit to the Engineer for approval:
 - 1. Pea gravel sieve analysis
 - 2. Product data for perforated and non-perforated tubing
 - 3. Product data for all fittings and connections

1.5 QUALIFICATIONS

- A. The Contractor or subcontractor responsible for field base establishment, field subsurface drainage, field washwater and irrigation systems, and field permeable aggregate placement and compaction shall be submitted to the Field Landscape Architect for approval. Specific prequalification requirements are included as follows:
 - 1. Contractor or sub-contractor shall be and has been actively and directly engaged in constructing similar natural or synthetic field projects for a period of five (5) or more years and shall provide proof of four (4) or more sports field base installations completed in the

past two (2) years. as used in this section means a project similar in character to the work in which each respective firm or their employee will perform on this project. The "similar project" shall also be equal or greater in scale and complexity than the work for which each firm will be engaged to perform on this project. The "similar" project must be a natural or synthetic turf athletic field and/or a rubberized running track project, consisting of at least 75,000 sf of field surface area and a 400m, 8 lane running track. The Contractor's experience shall include completion of high school, college, or professional level competition fields. The playing field system shall include earthwork, washwater or irrigation systems, drainage and subsurface drainage systems, and base aggregate placement and compaction. Provide a listing of all construction contracts (whether completed or in progress) entered into or performed by the Contractor or subcontractor within the past five years for projects similar in scope, time and complexity to the work called for under this Contract; include the names of the contracts, and the names and contact information of the owners.

PART 2 - PRODUCTS

2.1 PERFORATED AND NON-PERFORATED TUBING

- A. The piping shall be corrugated polyethylene drainage tubing. The perforated and non-perforated collector tubing shall be smooth interior wall CPEP.
- B. Material shall conform to requirements of Type III, Grade 4, Class "C" polyethylene as specified in ASTM D1248.
- C. Dimensions:
 - 1. Inside diameter variance shall not exceed -0.0% or +5%.
 - 2. Lengths shall be in coiled configuration with a -0.0% tolerance.
- D. Tubing shall conform to U.S. Department of Agriculture Soil Conservation Service, Engineering Standard 606.
- E. For perforated collector piping, water inlet areas shall be slotted with a width of 1/16" "0.020" to a maximum of 3/32" "0.030" uniformly spaced circumferential slots located on the inner depression of the corrugation, totaling a minimum of 1.25 square inches per lineal foot. The perforations shall provide a clear opening. Tubing with perforations that are punched with a flap type opening or that are not uniform will be rejected.
- F. Flat Drains: For perforated piping, use "AdvanEdge" flat pipe, 1" x 12" without geotextile fabric wrapping. Water inlet areas shall be slotted with a width of 1/16" (0.020) to a maximum of 3/32" (0.030) uniformly spaced circumferential slots located on the inner depression of the corrugation, totaling a minimum of 1.25 square inches per lineal foot. The perforations shall provide a clear opening. Tubing with perforations that are punched with a flap type opening or that are not uniform will be rejected. Use manufacturers end caps, couplers, and fittings to connect to the collector pipe.
- G. For perforated piping within field event area, utilize single wall CPEP pipe without geotextile fabric wrapping. Water inlet areas shall be slotted with a width of 1/16" (0.020) to a maximum of 3/32" (0.030) uniformly spaced circumferential slots located on the inner depression of the corrugation, totaling a minimum of 1.25 square inches per lineal foot. The perforations shall provide a clear opening. Tubing with perforations that are punched with a flap type opening or that are not uniform will be rejected.
- H. Fittings and Connections:
 - 1. Fittings shall be as furnished by the manufacturer of the pipe.
 - 2. Connections of tubing lengths shall be with split coupling or snap-in-type couplings utilizing polyethylene or construction tape.
 - 3. Tubing is to be inserted into sockets for the full socket length. "Slip-fit" connections will not be permitted.
 - 4. All split coupling connections are to be fully taped. All connections at fittings and connections are to be taped at interface of exposed joint.

2.2 PEA GRAVEL

- A. Pea-gravel bedding for perforated pipe shall be clean, washed, uniformly graded 3/8" to 1/8". The pea gravel material graduation must meet the following sieve analysis:

<u>Sieve Size</u>	<u>Percent Passing</u>
1/ 2"	100
3/ 8"	90 - 100
# 4	5 - 15
# 8	0 - 10
# 100	0 - 0.6
# 200 (wet sieve)	0 - 0.4
# 270 (wet sieve)	0 - 0.2

2.3 TESTING

- A. The Owner will be performing testing of materials delivered to the job site for the purpose of verifying compliance with the contract documents. The Owner's testing is for this purpose only and not for construction quality control by the Contractor.
- B. The Contractor shall coordinate directly with the Owner's testing firm relative to the delivery schedules of the imported materials.
- C. The Contractor shall provide testing and surveillance as required to assure materials and work fully comply with contract requirements.
- D. The Contractor at a price equal to the Owner's contract testing agreement shall pay for owner's tests that do not meet specifications. The Contractor shall pay directly to the testing organization upon invoice to the owner, which has been approved by the Engineer.
- F. Slot drain catch basins shall be in-line catch basins and plastic trash bucket. Outlet pipe shall be 6" diameter.
- G. Slot drain catch basin shall match product used for slot drain.

2.4 SLOT DRAINS

- A. The slot drain shall be pre-manufactured as modular interlocking units.
- B. Slot drain body shall be composed of polymer concrete or HDPE.
- C. Slot drain internal dimensions shall be a minimum of 4" width and an 8" minimum depth.
- E. Slot drain shall be ACO System 2000 or approved equal, with a neutral bottom.
- F. Slot drain catch basins shall be in-line catch basins with polymer concrete cover and plastic trash bucket. Outlet pipe shall be 6" diameter.
- G. Slot drain catch basin shall match product used for slot drain.

PART 3 – EXECUTION

3.1 TRENCHING

- A. Coordination: It is the responsibility of the Contractor to ensure that electrical conduits and irrigation/wash water piping is installed at a sufficient depth below subgrade before the trenching for the subsurface drainage system to avoid conflicts between systems.
- B. Excavation shall be made to the alignment, elevation, grade and slope as indicated on the drawings.
- C. Trenching shall be accomplished utilizing equipment with slope and depth control, such as "Laser Plane Control System", so as to ensure accuracy in the bottom of the trench.
- D. No high points above designated invert or calculated trench bottom elevation will be permitted. No sloughing of site material or loose excavated soil will be permitted to remain in the trenches.
- E. Surplus excavated soil shall be removed from the field area. Excavated material may not remain on subgrade. Excess soil material shall be disposed of off-site.

- F. Provide a smooth, even subgrade after removal of the trench material. Subgrade to be compacted to 95% density. Leave no loose material on the subgrade.

3.2 PLACEMENT

- A. Excavation below invert grade must be established to a depth so as to provide for specified placement of pea gravel bedding at bottom of pipe elevation prior to laying the tubing.
- B. Pea-gravel bedding for perforated pipe shall be clean, washed, uniformly graded 3/8" to 1/8".
- C. No foreign material will be permitted inside, alongside, under, or on top of, installed tubing.

3.3 BACKFILL

- A. The backfill for all round perforated pipe shall be clean washed pea gravel, uniformly graded 3/8" to 1/8".
- B. Specified bedding shall not be placed until Engineer approves the trench.
- C. Trench backfill shall not be placed before Engineer approves perforated pipe placement.
- D. During placement of specified trench backfill, pipe must be held in place with a hand device to prevent displacement and provide for achieving specified invert elevation. Do not damage pipe or allow pipe to be displaced by placement of backfill material.

3.4 CONNECTIONS

- A. All connections are to be made with approved fittings as recommended by the tubing manufacturer and approved by the Engineer.
- B. Tubing is to be inserted into sockets for the entire length. Tape all connections utilizing polyethylene or construction tape.
- C. No foreign material will be permitted inside the installed tubing.
- D. Cap the ends of all lateral runs as shown on the drainage plan. All open ends during construction are to be temporarily capped or plugged.
- E. Where detailed, connection of laterals to collector drains shall be made with a combination reducing tee and reducing saddle tee or end tee as applicable, utilizing snap connections.

3.5 EQUIPMENT MOVEMENT

- A. No trucks or equipment will be allowed to drive over the top of the trenches except track-equipped machinery utilized in spreading imported granular materials. Backfilled trenches are to be staked and "flagged" 3' above grade a maximum 20' spacing for identity.

3.6 SLOT DRAIN INSTALLATION

- A. Install slot drains per manufacturer's recommendations. Slot drain channels shall be installed in minimum 6" thick concrete foundation envelope per details.
- B. The top of the slot drain shall be flush with adjacent concrete or asphalt paving and shall permit positive water drainage into the slot drain without surface water ponding. The slot drain surface will be covered with rubberized surfacing, allowing for a coarse finish at the surface.
- C. Protect surfaces and interior of channel during placement of concrete.
- D. Following final set of concrete, remove slot and grate protection, place covers in final position and engage locking bolts in correct location.

END OF SECTION 33 46 16.13
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SECTION 33 46 23.16 - FIELD PERMEABLE AGGREGATE

PART 1 - GENERAL

1.1 SCOPE OF WORK

- A. Include all labor, material, transportation and services to complete installation of the permeable aggregate base materials as shown on the drawings for the field including:
 - 1. Final subgrade establishment
 - 2. Structural Soil-Bearing Fabric
 - 3. Base Course Permeable Aggregate
 - 4. Top Course Permeable Aggregate
 - 5. Recycled Plastic Edge Anchor
 - 6. Cellular Confinement System at Landscape Turf

1.2 STANDARD SPECIFICATIONS

- A. All sections of the standard specifications applicable to any and all parts of this project shall govern, except as specifically modified in these contract documents.
 - 1. The Green Book Standard Specifications for Municipal Public Works Construction, California State Chapter (latest edition).
 - 2. American Society for Testing and Materials (ASTM).
 - 3. American Association of State Highway and Transportation Officials, (AASHTO).

1.3 RELATED WORK SPECIFIED IN OTHER SECTIONS

- A. Section 03 30 53 Miscellaneous Cast-In-Place Concrete
- B. Section 31 00 00 Earthwork
- C. Section 31 22 16 Field Subgrade Establishment
- D. Section 33 34 00 Site Storm Drainage
- E. Section 33 46 16.13 Field Subsurface Drainage

1.4 SUBMITTALS

- A. Submit to the Field Landscape Architect for approval:
 - 1. Qualifications of base contractor.
 - 2. Permeable structural fabric product data.
 - 3. Concrete Anchors.
 - 4. Base Course Permeable Aggregate sieve analysis.
 - 5. Base Course Permeable Aggregate infiltration rate (for material compacted to a minimum density of not less than 98% of maximum dry density as determined by ASTM D698).
 - 6. Top Course Permeable Aggregate sieve analysis.
 - 7. Top Course Permeable Aggregate infiltration rate (for material compacted to a minimum density of not less than 98% of maximum dry density as determined by ASTM D698).
 - 8. Equipment and procedures to be utilized for the permeable aggregate installation.
 - 9. Recycled Plastic; Manufacturers Published Product Data.
 - 10. Cellular confinement System product

1.5 QUALIFICATIONS

- A. The Contractor or subcontractor responsible for field base establishment, field subsurface drainage, field washwater and irrigation systems, and field permeable aggregate placement and compaction shall be submitted to the Field Landscape Architect for approval. Specific prequalification requirements are included as follows:

1. Contractor or sub-contractor shall be and has been actively and directly engaged in constructing similar natural or synthetic field projects for a period of five (5) or more years and shall provide proof of four (4) or more sports field base installations completed in the past two (2) years. as used in this section means a project similar in character to the work in which each respective firm or their employee will perform on this project. The "similar project" shall also be equal or greater in scale and complexity than the work for which each firm will be engaged to perform on this project. The "similar" project must be a natural or synthetic turf athletic field and/or a rubberized running track project, consisting of at least 75,000 sf of field surface area and a 400m, 8 lane running track. The Contractor's experience shall include completion of high school, college, or professional level competition fields. The playing field system shall include earthwork, washwater or irrigation systems, drainage and subsurface drainage systems, and base aggregate placement and compaction. Provide a listing of all construction contracts (whether completed or in progress) entered into or performed by the Contractor or subcontractor within the past five years for projects similar in scope, time and complexity to the work called for under this Contract; include the names of the contracts, and the names and contact information of the owners.

PART 2 - MATERIALS

2.1 STRUCTURAL SOIL-BEARING FABRIC

A. Fabric

1. Material: Fabric to be 100% Polypropylene, non-woven, needle-punched fabric with a minimum weight of 4.0 oz/sy.
2. Physical Properties:

Tensile Strength, lbs., (ASTM D-4632):	100
Elongation (%), (ASTM D4632):	50
Puncture Strength, (lbs), (ASTM D4833):	65
Mullen Burst Strength (PSI), (ASTM D3786):	225
Trapezoidal Tear, (lbs), (ASTM D4533):	45
Abrasion Res. % Str. Ret., (ASTM D4886):	80
Coefficient. of Perm., cm/sec., (ASTM D4491):	0.22
Flow Rate Gal./Min./Sq. Ft.) (ASTM D4491):	140

2.2 BASE COURSE PERMEABLE AGGREGATE

- A. The base course permeable aggregate shall be installed below the top course permeable aggregate as applicable.
- B. Aggregate to be open-graded, fractured, friction course. To ensure free drainage, material to be clean with minimal fines. The compacted base course permeable aggregate minimum infiltration rate shall be 40 inches per hour when the material is compacted to a minimum density of not less than 98% of maximum dry density as determined by ASTM D698.
- C. Base course material to be a minimum of 75% fractured with at least one fractured face by mechanical means on each individual particle larger than 1/4". A sand and gravel source may be acceptable for this material.

Gradation: Aggregate to meet the following particle size limitations:

<u>Sieve Size</u>	<u>Percent Passing by Weight</u>
1-1/4"	100
1"	90 - 100
3/4"	80 - 100
1/2"	50 - 80
3/8"	40 - 60
No. 4	15 - 40
No. 8	10 - 20
No. 30	5 - 15
No. 100	0 - 3
No. 200 (wet sieve)	0 - 2.0

2.3 TOP COURSE PERMEABLE AGGREGATE

- A. Aggregate to be open-graded, fractured, friction course. To ensure free drainage, material to be clean with minimal fines. The compacted top course permeable aggregate minimum infiltration rate shall be 20 inches per hour when the material is compacted to a minimum density of not less than 98% of maximum dry density as determined by ASTM D698.
- B. Top course material to be 100% fractured crushed rock material. A quarry source is required for this material.
- C. Gradation: Aggregate to meet the following particle size limitations:

<u>Sieve Size</u>	<u>Percent Passing by Weight</u>
3/4"	100
1/2"	90 - 100
3/8"	70 - 90
No. 4	30 - 60
No. 8	20 - 40
No. 30	5 - 15
No. 100	2 - 5
No. 200 (Wet Sieve)	0 - 3.0
No. 270 (Wet Sieve)	0 - 1.5

2.4 TESTING

- A. The Owner will be performing testing of materials delivered to the job site for the purpose of verifying compliance with the contract documents. The Owner's testing is for this purpose only and not for construction quality control by the Contractor.
- B. The Contractor shall coordinate directly with the Owner's testing firm relative to the delivery schedules of the imported materials. Sampling will be scheduled each day deliveries occur.
- C. The Contractor shall provide testing and surveillance as required to assure materials and work fully comply with contract requirements.
- D. The Contractor at a price equal to the Owner's contract testing agreement shall pay for owner's tests that do not meet specifications. The Contractor shall pay directly to the testing organization upon invoice to the owner, which has been approved by the Field Landscape Architect.

2.5 RECYCLED PLASTIC EDGE ANCHOR

- A. Includes all materials required to provide a secure recycled plastic edge for establishment of Permeable Aggregate grade and anchoring of synthetic turf.
- B. A recycled plastic lumber nailer board shall be installed per the details to secure the turf. Product shall be manufactured from 100% recycled materials, consisting of HDPE Plastic Lumber. Material should be dimensional lumber in lengths no shorter than 6'.

1. Where attachment is scheduled to concrete curbing, provide minimum 2"x4" nominal dimensional lumber.
- C. Manufacturer's reference: Product is available from RESCO Plastics, Inc., Coos Bay, Oregon. (800) 266-5097 (Maxituf); or Black Rhino Recycling, Inc. (2x4 UG-2X4BL8); (800) 974-4669' www.blackrhinoproducts.com.
- D. Concrete Anchoring: Concrete wedge anchor, zinc plated, 3/8" x5" length, partially threaded, with zinc plated washer and nut.
- E. Steel power-load driven or ram-set Concrete Anchor Nail, minimum shank diameter 5/32", minimum head/washer diameter 3/8", sufficient length to insure a minimum 2" embedment. Individual anchors shall develop a minimum 450 lb shear, 350 lb tension in 4,000 psi concrete at 2" embedment.

2.3 CELLULAR CONFINEMENT SYSTEM

- A. System shall be manufactured specifically for the purpose of stabilizing, securing, or armoring exposed soil slopes. System shall be manufactured from high-density polyethylene or equivalent, incorporating structural components such as tendons and anchors as required to secure the system to the subgrade and its own constituent components.
- B. System Geometry
Minimum Cell Dimensions shall be 2" minimum depth x 3" minimum measurement across any opening.
- C. Approved Systems and Manufacturer contact
 1. EnviroGrid, manufactured by GeoProducts, Houston TX (281) 820-5493
 2. Miraweb, manufactured by TC Mirafi, Pendergrass GA (706) 693-2226
 3. Presto GeoWeb, manufactured by Presto Products Company, Appleton WI (920) 738-1118
 4. TenWeb, manufactured by TENAX Corp., Baltimore MD (800) 356-8495
 5. TerraCell, manufactured by WEBTEC, Inc. Charlotte NC (800) 438-0027
- D. Geotextiles incorporated into the system shall be only as directed by the approved system manufacturers printed installation direction.
- E. Backfill
 1. Material 2.2 Base Course Permeable Aggregate for CSS's deeper than 3".
 2. Material 2.3 Top Course Permeable Aggregate for CSS's 2"-3"

PART 3 - EXECUTION

3.1 SUBGRADE ESTABLISHMENT

- A. No work shall be performed in this section until subgrade is 100% completed and accepted by the Field Landscape Architect.
- B. Finish subgrade shall be compacted to a minimum 95% maximum dry density.
- C. Subgrade shall be established to within the tolerance of +0.00' or -0.10' of the design subgrade elevation.

3.2 STRUCTURAL SOIL-BEARING FABRIC INSTALLATION

- A. No loose material is allowed on subgrade prior to placement of structural fabric. Loose material is to be removed prior to placement.
- B. Fabric to be laid on smooth, compacted, subgrade surface over the entire surface area, including below drainage lateral piping.
- C. Placement of structural-bearing fabric requires approval of subgrade conditions by Field Landscape Architect.

- D. Structural fabric must be flat on stabilized subgrade for full width.
- E. Dimensions to be a minimum width of 12.5' and minimum continuous length of 150 lf.
- F. When the length of the fabric is not continuous, the lateral seam shall have a minimum overlap of 24".
- G. Fabric shall not be folded or turned up along the edges.
- H. The fabric shall be field cut as necessary to meet specified tolerances of distance from drainage trenches.
- I. In no instance shall fabric cover drainage lateral piping.
- J. Stabilization: Immediately upon laying, the fabric is to be covered with base aggregate. No loaded trucks are to be permitted to move over fabric-covered surfaces until a minimum of 4" of aggregate has been placed, except if specifically approved by the Field Landscape Architect. The Contractor must execute strict, direct - 100% - control of all vehicle movement on site.

3.3 EQUIPMENT MOVEMENT

- A. No trucks or equipment will be allowed to drive over the top of the drainage pipe or trenches except track-equipped machinery utilized in spreading base aggregate materials, or where a 12" depth base aggregate temporary roadway has been established. Backfilled trenches are to be staked and "flagged" 3' above grade at 20' minimum intervals for identity.
- B. In the event non track-equipped traffic is observed or evidenced to cross piping or trenches, the Contractor shall, at their own expense, expose the drainpipe in the area directed for observation by the Field Landscape Architect, repair any damage promptly and reinstall backfill per specifications.

3.4 AGGREGATE PLACEMENT

- A. Moisture Content: Aggregate to contain 3.5% to 4.0% moisture content to ensure that fines do not migrate and to facilitate proper compaction. Contractor must ensure that aggregate leaving the source plant meets this requirement and is required to apply water to aggregate on site to attain and maintain this minimum moisture content in stockpile and during all placement operations.
- B. Prior to aggregate placement, remove any foreign material or contamination from the surface of the structural fabric and drainage trench or lateral piping.
- C. Surface must be free of standing water and subgrade stabilized with structural fabric in place prior to placement.
- D. Materials to be placed in layers not exceeding 6" compacted in depth. Each layer must be spread uniformly with equipment that will not cause perceptible separation in gradation (segregation), preferably a self-propelled paving machine.
- E. Should there occur, during any stage of the spreading or stockpiling, a separation of the material particles, the Contractor must immediately remove and dispose of segregated material and correct or change handling procedures to prevent any further separation.
- F. A single lift of permeable aggregate material may be utilized in lieu of the two lifts specified, provided the overall depth is equivalent to the total of the two lifts specified, and that the most restrictive tolerances and permeability requirements are met. The permeability rate must be a minimum of 40" per hour throughout the entire aggregate column, and the finish grade tolerances are met.

3.5 AGGREGATE COMPACTION

- A. Each layer shall be compacted to a minimum density of not less than 92-95% of maximum dry density as determined by ASTM D698 and measured using a nuclear method.
- B. Use Static Tandem Drum-type roller of not less than five tons weight.

3.6 AGGREGATE TOLERANCES

- A. The Contractor shall utilize a laser plane system for grade control.

- B. The surface of the base course permeable aggregate in areas to be covered with top course aggregate as applicable shall not deviate from designated compacted grade within the range of -0.50" and +0.00".
- C. The surface of the top course permeable aggregate shall not deviate from designated compacted grade with the range of -0.00" and +0.25".
- D. Upon completion of the fine grading, compaction, and Contractor confirmation of conformance with the tolerances, the Contractor shall notify the Field Landscape Architect and schedule an inspection for approval. The Contractor shall have a laser plane system available to the Field Landscape Architect for the inspections. The Contractor shall not be authorized to place synthetic turf over the permeable aggregate until it has been inspected and approved by the Field Landscape Architect.
- E. Upon completion of elevation verification, the entire permeable aggregate surface shall be inspected for planarity. Planarity inspection shall be completed in conjunction, coordination with the synthetic turf vendor. The installation foreman for the synthetic turf shall be present at the time of the inspection. Inspection shall consist of stretching a stringline taut over the finished permeable aggregate surface at such interval as may be required to confirm surface planarity and acceptance for installation of synthetic turf surface. Any deviation greater than ¼" shall require remediation efforts as may be required to meet subgrade tolerance.

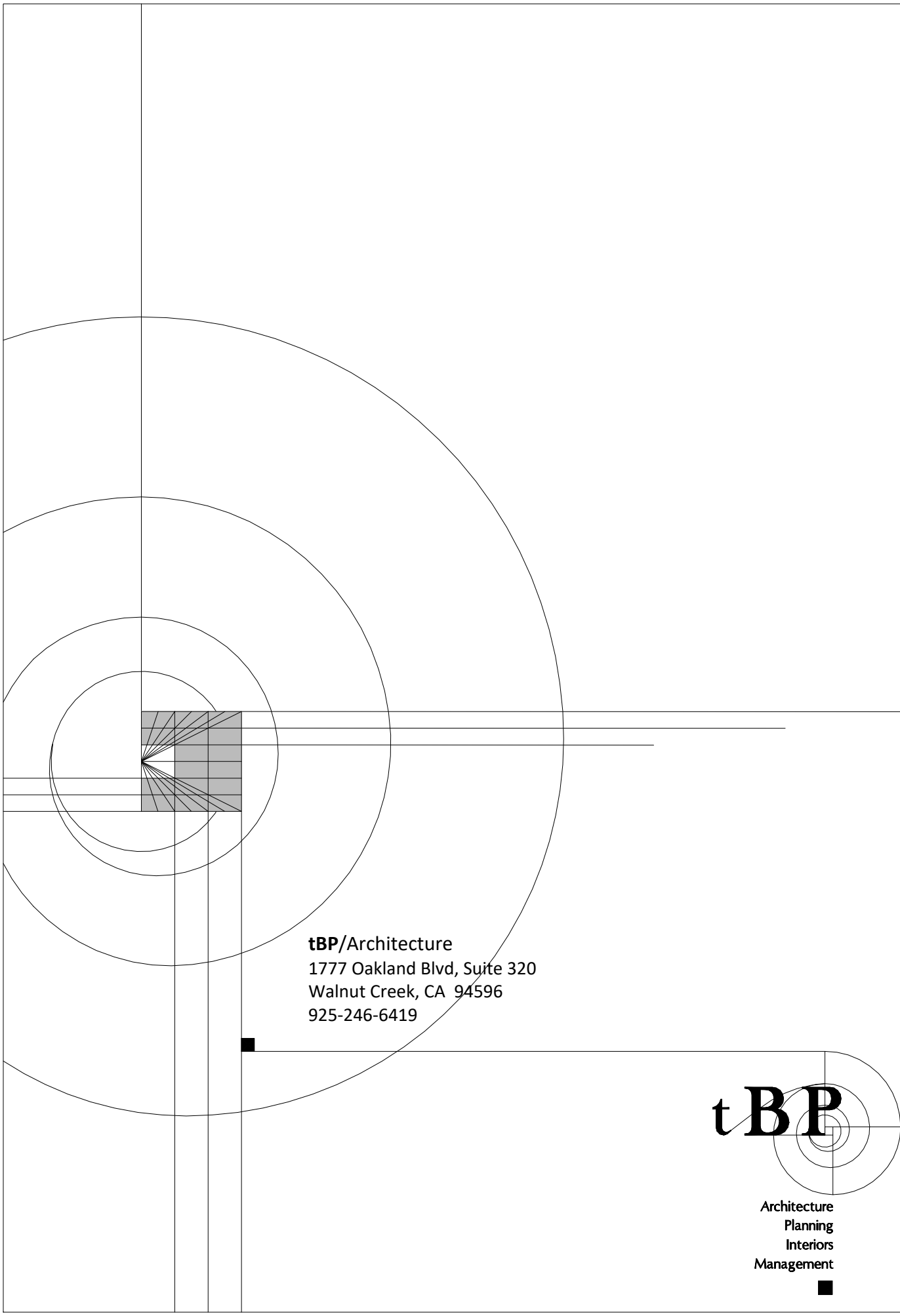
3.7 RECYCLED PLASTIC EDGE ANCHOR

- A. Prior to proceeding with Edge Anchor installation, confirm with the Engineer the final elevation for installation relative to adjacent surfaces.
- B. The Edge Anchor may be temporarily set with temporary hardware to establish the proper line and grade. This temporary hardware may remain after final installation.
 - 1. Wedge Anchor
 - a. The Plastic Edge Anchor may be temporarily set with power-loads to establish the proper line and grade. This temporary hardware may remain after final installation.
 - b. Once the initial line and grade has been established, pre-drill the edge anchor and establish a void in the adjacent concrete surface that meets the approved anchor supplier's requirements for proper securing of the anchor.
 - c. Minimum requirements for anchor installation:
 - i. Depth of Embedment: 3" or as recommended by the anchor supplier, whichever is greater.
 - ii. Horizontal Spacing: no greater than 36" on center and 12" from end of any length of lumber.
 - iii. Nut Torque: Per approved manufacturer's recommendation.
 - iv. Do not trim bolt ends. Bolts with trimmed or damaged ends will be rejected and must be removed.
 - 2. Concrete Anchor Nail
 - a. The Plastic Edge Anchor may be temporarily set with power-loads placed at the Contractors option to assist in establishing the proper line and grade. This temporary hardware may remain after final installation.
 - b. Once the initial line and grade has been established, install the specified ram-set or power-load driven Concrete Anchoring Nails in manner consistent with the approved manufacturers printed instruction and the specified spacing.
 - c. Minimum requirements for Concrete Anchor Nail installation:
 - i. Depth of Embedment: 2" or as recommended by the anchor supplier, whichever is greater.
 - ii. Horizontal Spacing: no greater than 21" on center and 6" from end of any length of lumber.
 - iii. Stagger the spacing of each Anchor up and down within the middle one-half the face of the Recycled Edge Anchor.

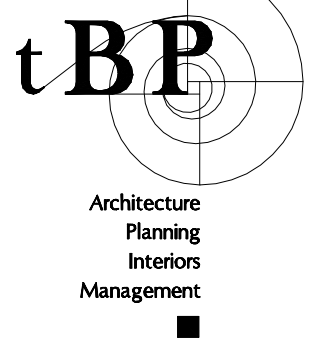
3.8 CELLULAR CONFINEMENT SYSTEMS

- A. Preparation of the native soil subgrade shall be performed as described above for general subgrade preparation including moisture conditioning and protections and establishment of uniform density. Planarity requirements on slopes are +/-1" in any given location as identified using standard stringline techniques. For "rolling" grades and constant slope transitions, the Engineer will generally approve or disprove planarity deficiencies as they occur.
- B. All CCS installation work shall conform to the approved manufacturers printed installation direction except as approved or directed in writing prior to installation.
- C. The CSS is intended as a structural base for the installation of landscape synthetic turf and shall be installed continuously between and up to the perimeter edge anchor as shown and described.
- D. Backfill cellular voids with the approved permeable aggregate products carefully and in such a manner as to not disturb or damage the work in progress.
- E. Fully consolidate aggregate fills in a manner resulting in a firm, unyielding finished surface that is generally planar and equal to the top of the cellular structure.

END OF SECTION 33 46 23.16
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