PROJECT MANUAL

LOWELL JOINT SCHOOL DISTRICT

MAYBROOK ELEMENTARY SCHOOL
INTERIM HOUSING

DSA File no. 16-65
DSA Application no. 03-122420

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Whittier, CA 90604

JULY 29, 2022

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DOCUMENT 00 01 07 - SEALS PAGE

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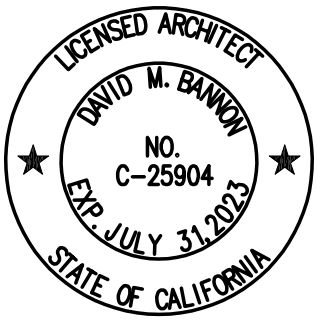

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END OF DOCUMENT 00 01 07

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SECTION 01 10 00 - CONSTRUCTION DOCUMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. The General Conditions and Division 1 are a part of this Section and the Contract for this Work and apply to this Section as if repeated fully herein.

B. The Construction Documents include the Drawings and the Technical Specifications (including addenda, change orders, and other modifications), which are part of the Project Manual. Together with the other documents contained in the Project Manual they comprise the Contract Documents as described in the General Conditions. The Construction Documents describe the form and extent as well as the materials, products and equipment which are to be incorporated into the Work.

1.2 JURISDICTION

A. No trade jurisdictional allocation of this work is intended by the subdivision of the Construction Documents. It shall be the Contractor's sole responsibility to subdivide the Work in the manner he deems necessary. In that regard, it shall be the Contractor's responsibility to insure that all apportioned work be coordinated so as to provide complete working systems where such systems are composed of two or more components of work.

1.3 COMPLIMENTARY

A. The Drawings and Technical Specifications are complimentary and what is called for by one is called for by all. Generally, the Drawings show the composition of the various components and the Technical Specifications describe the nature and methods of incorporation of the various components. All aspects of the construction are not necessarily identified in both the Drawings and Technical Specifications. However, what is required by one is required by both. In cases of conflicting information, the Contractor is to provide the more costly option. In cases of conflicting information of equal value, Technical Specifications supersede the Drawings, Details supersede Notes and performance requirements supersede product model specifications. All cases of conflicting information shall be brought to the attention of the Architect.

1.4 USE OF MATERIALS, PRODUCTS AND EQUIPMENT

A. It is intended that all materials, products and equipment be used in the manner intended by the manufacturer. In the absence of instructions to be contrary, and where readily identifiable, the manufacturer's or his trade associations specifications and/or directions are hereby incorporated by reference. In the absence of specific manufacturer's instructions the trade associations general specifications or standards shall apply including any and all ASTM or ANSI performance and installation standards for the material, product or equipment.

1.5 INTENT OF THE DOCUMENTS

A. It is the intent of these Construction Documents to include all items and components for the proper execution of the Work, and the provisions of a complete and functional facility. In that regard all appurtenant and accessory items and components required for construction of complete and functional systems within the construction shall be provided whether specifically identified in these Construction Documents or not.

1.6 KEYNOTING

A. A keynoting system is used on the drawings for material references and notes. Refer to the Keynote Legend on the drawing for the information which relates to each keynote symbol on the respective drawing. Where provided within the drawings, keynotes reference specification sections by means of a five-digit number identifying the section where a more complete description of the item will be found. The letter suffix of the keynote is a sequential differentiation and does not relate to any corresponding reference letter in the specification. Keynotes do not describe construction means, methods, techniques, sequences, or procedures. No trade jurisdictional allocation of this work is intended by the subdivision of these keynotes. It shall be the Contractor's sole responsibility to subdivide the work in the manner he deems necessary.

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION

3.1 PERFORMANCE BY THE CONTRACTOR

A. Performance by the Contractor shall be required only to the extent consistent with the Construction Documents and reasonably inferable form them as being necessary to produce the intended results.

B. "Reasonably inferable" is defined as a degree of interpretation of the documents which will provide, at the Contractor's expense, complete working systems within the parameters of the following examples, but not limited to these examples:

1. Where light fixtures or electrical appliances and equipment are indicated, it is reasonably inferable that power and circuiting be provided.
2. Where plumbing fixtures are indicated, it is reasonably inferable that waste and vent be provided and supply and or return lines.
3. Where HVAC equipment is indicated, it is reasonably inferable that structural support, power and condensate piping be provided.
4. Where casework is indicated, it is reasonably inferable that anchorage or support be provided.
5. Where waterproofing systems are indicated, it is reasonably inferable that bond breakers, protective boards, backer rods, sealants and flashing be provided.
6. Where items of work are indicated which are not prefinished it is reasonably inferable that shop or field finish is required. Finish shall be to the standard of quality specified for similar materials.

C. In providing complete working systems, in the absence of complete information, the Contractor shall be required to provide components to a standard of quality consistent with similar work specified. In the

absence of such standard, he shall be entitled to provide such items at the lease cost to him consistent with industry standards.

END OF SECTION 01 10 00

SECTION 01 20 00 - PROJECT MEETINGS

GENERAL

1.1 SECTION INCLUDES

A. This Section specifies administrative and procedural requirements for Project meetings, including but not limited to, the following:

1. Job start meeting.
2. Pre-installation conferences.
3. Progress meetings.
4. Meetings as required by the Owner and/or Owner's Representative.

1.2 RELATED SECTIONS

A. Section 01 30 00: Submittals

PART 2 - PRODUCTS (Not applicable)

PART 3 - EXECUTION

3.1 PRE-CONSTRUCTION CONFERENCE

A. The Pre-construction conference shall take place no more than 10 days after the Notice of Award in accordance with General Condition, Owner's Representative will schedule a job start meeting before starting the Work, at a time and date determined by Owner's Representative. Meeting shall be held at the Project site or another location as determined by Owner's Representative. Meeting will be held in order to review responsibilities, procedures, and other administrative requirements contained within the Contract Documents.

B. Owner, Owner's Representative, Contractor, all major subcontractors and other interested parties shall attend the meeting. All participants at the meeting shall be familiar with the Project and authorized to conclude matters relating to the Work.

C. Agenda items shall include significant items which could affect progress of the Work, including, but not limited to the following:

1. Introduction and Identification of Owner's Representative, IOR, Owner's consultants, Contractor, Contractor's major subcontractors.
2. Construction schedule and updating frequency (establish schedule for progress meetings)
3. Critical work sequencing
4. Designation of responsible personnel: persons authorized to represent and sign documents for the Owner, Owner's Representative, Contractor, and major subcontractors, with examples of official signature of each. (list names, addresses and telephone numbers of those persons authorized to act for the Contractor in emergencies, include a 24 hour cell or phone number)
5. Modification Procedures and forms (i.e. RFI, Bulletins, etc.)
6. Contractor reports and frequency i.e. Daily site report, RFI log, Submittal log, Construction photograph log, etc.

7. Procedures and forms for processing Applications for Payment, including handling of retention, on site stored material payments, withholding payments, rejection of and/or modification of payment request, etc.
8. Owner supplied Contractor installed materials.
9. Testing and Inspections, Surveys and Layout.
10. Submittal schedules of Shop Drawings, Product Data, Material Lists, Samples. Etc.
11. Procedures and maintenance of project record documents.
12. Use of the Project site and/or premises: Contractors use of premises including location of office, construction and storage areas, equipment deliveries, parking availability and parking areas, and routes for construction traffic.
13. Owners site usage, school schedules, etc.
14. Safety and first aid procedures including designation of Contractors safety officer. Review safety program.
15. Security procedures
16. Housekeeping, project site clean up procedures
17. Normal working hours

Contract Compliance Officer

18. Environmental Health & Safety
19. Future Pre-installation meetings. (required for coordination of Work)

D. Owner's Representative shall prepare and issue meeting minutes to attendees and interested parties. Response and/or to meeting minutes due to Owner's Representative no later than two (2) calendar days after the meeting date.

3.2 PRE-INSTALLATION CONFERENCES

A. Contractor shall coordinate and conduct pre-installation conferences at the Project site as required by related Sections of the Contract Documents.

B. Contractor, manufacturers, and fabricators involved in or affected by the installation and its coordination or integration with other pre-ceding and/or subsequent installations of Work shall attend the meeting. Contractor shall advise IOR, and Architect of scheduled meeting dates in order to secure their attendance.

1. Contractor shall review the progress of construction activities and preparations for the particular activity under consideration at each pre-installation conference, including requirements for the following:

a. Contract Documents
b. Options
c. Related Construction Directives and Change Orders
d. Purchases
e. Deliveries
f. Shop Drawings, Product Data, and quality-control samples
g. Review of mockups
h. Possible conflicts
i. Compatibility problems
j. Time schedules
k. Weather limitations
l. Manufacturer's recommendations
m. Warranty requirements
n. Compatibility of materials
o. Acceptability of substrates

p. Temporary facilities, barricades, utilities, sanitary facilities, signs and other temporary facility requirements.
q. Space and access limitations
r. Governing regulations
s. Safety
t. Inspecting and testing requirements
u. Required performance results
v. Recording requirements
w. Protection

C. Contractor shall record significant discussions and directives received from each conference. Contractor shall, within three (3) calendar days after the meeting date, distribute the minutes of the meeting to all concerned parties, including but not limited to, Owner's Representative, IOR, and Architect.

3.3 PROGRESS MEETINGS

A. Progress meetings will be held at the Project site at regular weekly intervals, or as determined by the Owner's Representative and/or Owner.

B. In addition to representatives of Contractor, Owner, IOR, Architect, each Subcontractor, supplier, or other entity concerned with current progress or involved in planning, coordination, or performance of the Work shall, if requested by Owner's Representative, be represented at these meetings. All participants at the conference shall be familiar with the Project and authorized to conclude all matters relating to the Work.

C. Failure of the Contractor to be so represented at any progress meeting which is held at a mutually agreed time or for which a written notice is given, shall not relieve Contractor from abiding by any and all Owner, Owner's Representative determinations or directives issued at such meeting.

D. Owner's Representative will review and correct or approve minutes of the previous progress meeting and will review other significant items affecting progress. Topics for discussion as appropriate to the status of the Project include but are not limited to:

1. Interface requirements
2. Construction Schedule
3. Sequence and coordination
4. Status of submittals / RFI's
5. Deliveries
6. Off-site fabrication
7. Access
8. Site utilization
9. Temporary Construction Facilities and Controls
10. Hours of work
11. Hazards and risks
12. Housekeeping
13. Quality and workmanship
14. Unforeseen conditions
15. Testing and Inspection
16. defective Work
17. Construction Directive
18. Request for Proposal
19. Change Order Proposals and Change Orders

20. Documentation of information for payment requests
21. Application for Payment
22. Other items as required or as brought forth.

E. No later than five (5) calendar days after each progress meeting, Owner's Representative will prepare and distribute minutes of the meeting to each present and absent party. Include a brief summary, in narrative form, of progress, decisions, directives, actions taken, and all other issues since the previous meeting and report.

3.4 ADDITIONAL MEETINGS

A. Owner's Representative, upon giving notice to the intended parties and without further obligation, may require additional meetings to discuss Work and/or Project related activities.

END OF SECTION 01 20 00

SECTION 01 30 00 - SUBMITTALS

GENERAL

1.1 SECTION INCLUDES

A. Procedures for submitting to the Architect/Engineer, schedules, shop drawings, product data, samples, material lists, manuals, warranties and certificates, etc., required by individual Specification Section and procedures for submitting finish hardware schedule and segregation of contract costs to the District.

B. Wherever possible, throughout the Contract Documents, the minimum acceptable quality of workmanship and materials has been defined by the name and catalog number of a manufacturer and by reference of recognized industry standards.

C. To ensure that specified products are furnished and installed in accordance with the design intent, procedures have been established for advance submittal of design data and for its review by the Architect.

1.2 RELATED SECTIONS

A. The General Conditions and Division 1 are part of this Section and the Contract for this Work and apply to this Section as if repeated fully herein.

B. Section 01 70 00: Contract Closeout.

C. Other Sections requiring submittals.

1.3 PROCEDURES

A. Contractor shall secure and submit Shop drawings, manufacturer's catalogs, samples, warranties, operating and instruction manuals, etc. to the Architect/Engineer for review and approval.

B. After the Architect has date-stamped, signed and reviewed submittals, with corrections noted, if any, the Architect will transmit submittals to Contractor.

1.4 SUBMITTALS

A. Approval of Submittals: Contractor shall clearly identify any deviations from the Contract Drawings and Specifications on submittals. Prior approval of any deviation by the District Architect/Engineer or his representative is required. Any deviation without said prior approval, even though stamped approved, is not acceptable.

1. Approval stamp is for design and quality only. No deviations. No quantities.

B. Deliver submittals to the Owner’s Representative. Identify project name and address, telephone number of Contractor, subcontractor and supplier. Identify, as appropriate, pertinent drawing sheets, detail numbers and Specification Section numbers. Clearly identify any deviations from Contract Documents.

C. Make submittals in accordance with the approved Construction Schedule, and approved Shop Drawing Submission Schedule, in sequence that avoids delaying work and progress of other Contractors.

D. CONTRACTOR SHALL THOROUGHLY REVIEW SUBMITTALS PRIOR TO SUBMISSION TO THE ARCHITECT/ ENGINEER.

E. Timing of Submittals:

1. In accordance with General Conditions, Contractor shall submit to Owner's Representative those Shop Drawings, Product Data, diagrams, materials lists, Samples and other submittals required by the Contract Documents.
2. The Contractor shall submit within ten (10) Days of the Award of Contract, a itemized listing of required submittals with a scheduled date for each submittal. The schedule of submittals shall provide adequate time between submittals in order to allow for proper review without negative impact to the Construction Schedule.
3. Schedule of submittals shall be related to Work progress, and shall be so organized as to allow sufficient time for transmitting, reviewing, corrections, resubmission, and re-reviewing.
4. Contractor shall coordinate submittal of related items and Owner's Representative reserves the right to withhold action on a submittal requiring coordination with other submittals until all related submittals are received by Owner's Representative.
5. Contractor shall revise, update and submit submittal schedule to Owner's Representative on the first of each month, or as required by Owner's Representative.
6. Contractor shall allow in the Construction Schedule, at least sixteen (16) days for Owner's Representative review following Owner's Representative receipt of submittal. For mechanical, plumbing, electrical, and other submittals requiring joint review with CMR, and/or others Contractor shall allow a minimum of eighteen (18) days following Owner's Representative receipt of submittal.
7. No adjustments to the Contract Time and/or Milestones will be authorized because of a failure to transmit submittals to Owner's Representative sufficiently in advance of the Work to permit review and processing.

F. In case of product substitution, Shop Drawing preparation shall not commence until such time Owner's Representative reviews said submittal relative to the General Conditions. Each submittal shall be accompanied by a letter of transmittal containing a complete itemized and numbered list of submitted materials. Separate letters of transmittal shall accompany each submittal from different subcontractors.

G. Resubmission: If requested, resubmit submittals in a timely manner. Resubmit as specified for initial submittal but identify as such. Indicate any changes which have been made other than those requested by the Architect.

1.5 SHOP DRAWINGS

A. Shop Drawings are original drawings prepared by Contractor, subcontractor, supplier, or distributor which illustrate some portion of work by showing fabrication, layout, setting, or erection details.

B. Draw shop drawings to an accurate scale that is large enough to indicate all pertinent features and methods.

C. Copies Required and Distribution: Unless otherwise indicated in individual specification sections, submit 6 sets of blueline prints.

1.6 PRODUCT DATA

A. Manufacturer's Standard Schematic Drawings:

1. Delete information which is not applicable to Project.
2. Supplement standard Drawings to provide additional information applicable to Project.

B. Manufacturer's catalog sheets, brochures, diagrams, schedules, performance charts, illustrations, and other standard descriptive data:

1. Clearly mark each copy to identify pertinent materials, products, or models.
2. Indicate dimensions and clearances required.
3. Indicate performance characteristics and capacities.
4. Indicate wiring diagrams and controls.

C. Copies Required and Distribution: Submit 6 copies.

1.7 SAMPLES

A. Samples:

1. Submit samples of sufficient size and quantity to clearly illustrate:

a. Functional characteristics of product or material, with integral parts and attachment devices.
b. Full range of colors, textures, and patterns.

2. Provide permanent identification for each sample.
3. Color and Pattern: Whenever a choice of color or pattern is available in a specified product, submit accurate color chips and pattern charts to the Architect/Engineer for review and selection.
4. Number Required: Submit 3 of each.

B. Field Samples: When specified, erect field samples and mock-ups at project site to illustrate materials, equipment, or workmanship and to establish standards by which completed work shall be judged.

C. After return of office samples or review of field samples, these items may be used in construction of project with approval of the Architect/Engineer.

1.8 MANUALS

A. Where Manuals are required to be submitted covering items included in Work, prepare Manuals in durable binders, approximately 8-1/2" by 11" in size, and provide following information:

1. Identification on, or readable through, front cover stating general nature of manual.
2. Neatly typewritten index at front of Manual, furnishing immediate information as to location in Manual of data or equipment involved.
3. Complete instructions regarding operation and maintenance of equipment involved.
4. Complete nomenclature of replaceable parts, their part numbers, current cost, and name and address of nearest vendor of parts.
5. Copy of all Guarantees and Warranties issued.
6. Copy of approved Shop Drawings with data concerning changes made during construction.

B. Extraneous Data: Where contents of Manuals include manufacturers' catalog pages, clearly indicate precise items included in this installation and delete, or otherwise clearly indicate, manufacturers' data which is not part of this installation.

C. Number of Copies Required: Deliver 6 copies to the Architect/Engineer for review, approval and distribution. The Architect/Engineer will return 3 copies to Contractor.

1.9 CERTIFICATES

A. Submit in triplicate, in accordance with requirements of each Specification Section.

1.10 COLOR SCHEDULES

A. The District shall review and approve color schedules prepared by the Architect/Engineer and distribute the approved schedules to Contractor.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

END OF SECTION 01 30 00

SECTION 01 40 50 - TESTING AND INSPECTION

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Testing and inspection services to meet requirements of the California Building Code (CBC), Title 24, Parts 1 and 2, as indicated on the Drawings.

C. Tests of materials are required by a DSA certified testing AGENCY as set forth in Section 4-335 of the California Building Standards Administrative Code.

1.02 RELATED SECTIONS

Provisions of the General Conditions, Supplemental Conditions and Division 01 apply to this Specification. Specifications that are referenced or related may include:

A. Section 01 04 50: Cutting and Patching

B. Section 01 10 00: Construction Documents

C. Section 01 30 00: Submittals

D. Section 01 50 00: Construction Facilities and Temporary Controls

E. Section 01 70 00: Contract Closeout

F. Section 01 74 00: Warranties and Guarantees

PART 2 – PRODUCTS (Not used)

PART 3 – EXECUTION

3.01 TESTS

A. OWNER will select and provide an independent DSA approved certified testing agency (AGENCY) to conduct tests, sampling, and testing of materials. AGENCY shall have DSA Laboratory Evaluation and Acceptance (LEA) Program acceptance. Selection of material to be tested shall be by the AGENCY and not by CONTRACTOR. Lab to be approved by Architect of record/Structural Engineer (where applicable) DSA.

B. Any material shipped from the source of supply prior to having satisfactorily passed such testing and inspection, or prior to the receipt of notice from IOR such testing and inspection is not required, shall not be incorporated into the Work.

C. OWNER will select, and directly reimburse, the AGENCY for costs of all DSA required tests and inspections; however, the OWNER may be reimbursed by CONTRACTOR for such costs for re-testing of deficient Work.

D. The independent testing AGENCY is not authorized to release, revoke, alter, or enlarge requirements of the Contract Documents or approve or accept any portion of the Work.

E. The AGENCY shall not perform any duties of CONTRACTOR.

F. CONTRACTOR shall provide an insulated curing box with the capacity for twenty (20) concrete cylinders and will relocate said box and cylinders as rapidly as required in order to provide for progress of the Work.

3.02 TEST REPORTS

A. Test reports shall include all tests performed, regardless of whether such tests indicate the material is satisfactory or unsatisfactory. Samples taken but not tested shall also be reported. Records of special sampling operations, when and as required, shall also be reported. Reports shall indicate the material (or materials) was sampled and tested in accordance with requirements of CBC, Title 24, Parts 1 and 2, as indicated on the Drawings. Test reports shall indicate specified design strength and specifically state whether or not the material (or materials) tested comply with the specified requirements.

3.03 VERIFICATION OF TEST REPORTS

A. Each testing AGENCY shall submit to the Division of the State Architect, in duplicate, a verified report covering all tests required to be performed by that AGENCY during the progress of the Work. Such report, covering all required tests, shall be furnished prior to Substantial Completion and/or, when construction on the Work is suspended, covering all tests up to the time of Work suspension.

3.04 INSPECTION BY OWNER

A. OWNER, and its representatives, shall have access, for purposes of inspection, at all times to all parts of the Work and to all shops wherein the Work is in preparation. CONTRACTOR shall, at all times, maintain proper facilities and provide safe access for such inspection.

B. OWNER, and its representatives, shall have the right to reject materials and/or workmanship deemed defective Work and to require correction. Defective workmanship shall be corrected in a satisfactory manner and defective materials shall be removed from the premises and legally disposed of without charge to OWNER. If CONTRACTOR does not correct such defective Work within a reasonable time, fixed by written notice and in accordance with the terms and conditions of the Contract Documents, OWNER may correct such defective Work and proceed in accordance with related Articles of the Contract Documents.

C. CONTRACTOR is responsible for compliance to all applicable local, state, and federal regulations regarding codes, regulations, ordinances, restrictions, and requirements.

3.05 INSPECTOR OF RECORD

A. An Inspector of Record (IOR) shall be employed by OWNER, and approved by ARCHITECT, STRUCTURAL ENGINEER and DSA in accordance with requirements of Title 24 of the California Code of Regulations with their duties specifically defined therein. Additional DSA certified inspectors may be employed and assigned to the Work by OWNER in accordance with the requirements of California Building Standards Administrative Code with their duties as specifically defined in Section 4-333(b).

B. Inspection of Work shall not relieve CONTRACTOR from any obligation to fulfill all terms and conditions of the Contract Documents.

C. CONTRACTOR shall be responsible for scheduling times of inspection, tests, sample taking, and similar activities of the Work.

3.06 TESTS AND INSPECTIONS

The following tests and inspections do not limit inspection of the Work but are required by DSA, other agencies, or are required in related Sections of the Contract Documents.

1. Concrete - CBC, Chapter 19A:

    a. Materials:

        1) Test of Materials: 1705A.3, ACI 318-14 Sections 26.12 & 26.13
        2) Portland Cement Tests: ACI 318, ASTM C 150.
        3) Concrete Aggregate: 1903A.5, ACI 318 Section 26.4.1.2, ASTM C 33.
        4) Reinforcing Bars: 1910A.2, ACI 318-14 Section 26.6.1.2
        5) Mix Designs: Table 1705A.3 Item 5, 1910A.1
        6) Admixtures: 1903A.6 ACI 318 Section 26.4.2.2 (b) and Table 26.4.2.2 (b)

    b. Quality:

        1) Proportions of Concrete: 1910A.1
        2) Mixing and Placing: Table 1705A.3 Item 5, 1910A.1
        3) Concrete Testing: 1905A.1.16, ACI 318-14 Section 26.12

    c. Inspection:

        1) Project Site Inspection: 1905A.7, 1705A.3.5
        2) Batch Plant: 1705A.3.3
        3) Weigh-Master Inspection: 1705A.3.3.1
        4) Reinforcing Bar Welding Inspection: 1705A.3.1 1903A.4.

2. Steel - CBC, Chapters 17A and 22A:

    a. Materials:

        1) Structural Steel: 2205A.1.
        2) Material Identification: 2203.A.1.

    b. Inspection and Tests:

        1) Test of Structural Steel: 1705A.2.
        2) Shop Fabrication Inspection: 1704A.2.5.
        3) Welding Inspection: 1705A.2.5.

3. Masonry - CBC, Chapter 21A:

    a. Materials:

        1) Masonry Units: 2103A.1.
        2) Mortar & Grout Aggregates: 2103A.3.1.
        3) Reinforcing Bars: 2103A.4.

b. Quality:

1) Portland Cement Tests: 2105A.2.
2) Mortar & Grout Tests: 2105A.3.
3) Masonry Core Tests: 2105.2
4) Reinforcing Bars: 2103A.4
5) Masonry Prism Tests: 2105A.2

c. Inspection:

1) Reinforced Masonry: 1705A.4.
2) Reinforcing Bar Welding: 1705A.3.1

END OF SECTION 01 40 50

SECTION 01 50 00 - CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Description of temporary utilities and protection of construction facilities which are to be provided and maintained by Contractor.

1.2 RELATED SECTIONS

A. General Conditions

1.3 TEMPORARY UTILITIES

A. Water:

1. Water used on work will be furnished and paid for by the Contractor. Contractor shall provide necessary temporary piping and temporary water meters from distribution point to points on site where water is necessary to carry on work, and upon completion of work shall remove temporary piping.
2. Provide suitable drainage system, subject to approval of the District Inspector, to carry construction waste water from site to an approved disposal location.

B. Electricity:

1. The Contractor will furnish and pay for electrical power necessary for construction purposes at site. The Contractor shall meter and pay for electrical utilities that are from sources installed temporarily for the project. Contractor shall provide necessary temporary wiring and lighting and shall remove all temporary wiring and lighting at the completion of the Work. Temporary wiring and lighting shall comply with requirements of the National Electrical Code. Contractor shall be responsible for all damage caused by overloading or other causes and the installation shall be satisfactory to the District Inspector.
2. Furnish and install area distribution boxes, so located that individual trades may use 100'-0" maximum length extension cords to obtain adequate power and artificial lighting, at points where required for work, for inspection and for safety.
3. Provide electricity needed for construction including connections for construction equipment requiring power.

C. Gas: Contractor shall provide and install gas equipment, gas meters and piping necessary to perform his work, and shall remove same upon completion of work. District shall pay for only the gas used in work which is drawn from existing meter sources..

D. Heating and Ventilation:

1. Provide, maintain, and pay for temporary heat sources needed for proper installation of work and to protect materials and finishes from damage due to weather.

2. Provide ventilation of enclosed areas to cure materials, to disperse humidity, and to prevent accumulation of dust, fumes, or gases.

E. Temporary Telephone: Contractor shall provide and pay all costs for all cellular telephones, business telephones, telephone, fax and data telephone lines at site for his use. Use of school telephones will not be permitted. The Contractor shall provide and pay all costs for two (2) telephone lines (1 voice, 1 fax) for the District Inspector.

F. Use means necessary to maintain temporary facilities and controls in proper and safe condition throughout progress of work.

G. Make required connections to existing utility systems with minimum disruption to services in existing utility systems. When disruption of existing service is required, do not proceed without the District Inspector's approval and, when required, provide alternate temporary service.

1.4 CONTRACTOR'S FACILITIES

A. Temporary Offices:

1. Contractor shall provide and maintain a trailer(s) on site for duration of project.

a. Trailer(s) shall have ample headroom; shall be properly lighted, heated and ventilated. Contractor shall provide an electric drinking fountain or bottled water.

2. Trailer(s), equipment and furniture shall remain Contractor's property. Contractor shall remove such property upon completion of work.

3. District's Inspector: The Contractor shall provide on site at the Contractor's sole expense, a temporary office structure of no less than 200 square feet and the said structure shall be utilized by the Inspector and Inspector shall be separate from space utilized by Contractor or construction personnel. All equipment and furnishings described herein shall remain the property of the Contractor and be maintained in good working order by the Contractor. Office is to be located as approved by the District Inspector and to be adequately maintained in fully operational condition until final acceptance of the project by the Board of Education. This office shall be of substantial waterproof construction with adequate natural light and ventilation. The door shall have a key-type lock and a deadbolt key lock. Equipment shall be as follows:

a. One office desk, a table satisfactory for the study of plans, one chair on wheels with arms, and two standard chairs, a lockable one 2-drawer filing cabinet with key, one plan rack and one large bookshelf.
b. Two private telephone lines, adequate electric lights, a plain paper facsimile machine and it’s supplies for the exclusive use of the District, and adequate air conditioning and heat for this office.
c. An electric water cooler shall be provided in the Inspector’s trailer for drinking water.

B. Storage Units:

1. Provide secure and waterproof storage units where required for the temporary storage of furniture, equipment and other items.

2. Storage Unit Construction: Walls, roof and doors minimum 16 gage steel; floors 1" tongue and groove hardwood or 3/4" minimum exterior type plywood, with undercarriage designed to accommodate forklift blades 42" to 60" long; doors at one end of storage unit, double wide swing out with waterproof gaskets and lockable steel locking bars.
3. Pay all charges and set the storage unit where directed by the District Inspector.
4. Remove storage unit from the site after removal of all the items that were temporarily stored and when directed by the District Inspector.

C. Sanitary Facilities:

1. Contractor shall provide temporary toilet facilities including which may consist of portable chemical toilets. Number of toilets shall be provided according to Cal OSHA requirement. Handwash facilities shall be provided according to Cal OSHA requirements.
2. Toilet facilities shall be kept supplied with toilet paper and kept in a clean and sanitary condition until completion of work, and then be removed from work site. Upon removal, that portion of site shall be properly cleaned and graded.

D. Contractor's Security Barricade:

1. Contractor shall erect temporary security barricade as required for safety and as specified. New or used material may be used.
2. Unless otherwise indicated or specified, barricade shall be constructed of 6'-0" high chain link fencing. Space posts not to exceed 10'-0" on centers. Posts shall be of following nominal pipe dimensions: terminal, corner, and gate posts 2-1/2", line posts 2". Chain link mesh shall be not less than #13 gage, 2" mesh, and in one width. Posts, mesh and accessories shall be galvanized. Contractor shall provide a durable green fabric screening in one width at all temporary security barricades.

    a. Mesh shall be attached to posts with #14 gage tie wire at 16" centers. A #6 gage steel tension wire with turnbuckles shall be installed at top and bottom of barricade fencing. Wire tie mesh to tension wires at 18" centers.
    b. Fabric shall be attached to mesh at top and bottom with wire ties at 2’0” centers.

3. Chain link fencing shall be free from barbs, icicles or other projections resulting from galvanizing process. Fence mesh and fabric having such defects will be rejected even though it has been erected.
4. Gates shall be fabricated of steel pipe with welded corners, and bracing as required. Mesh to be attached to frame at 12" centers. Provide all gate hardware of a strength and quality to perform satisfactorily until barricade is removed upon completion of work.
5. At completion of work, remove barricade and concrete post footings from site; backfill and compact fence footing holes. Existing surface paving that is cut into or removed shall be patched and sealed to match surrounding areas.

E. Other Enclosures:

1. Provide lockable, temporary weather-tight enclosures at openings in exterior walls to create acceptable working conditions, to allow for temporary heating and for security.
2. Provide protective barriers around trees, plants and other improvements designated to remain.

F. Storage Yards and Sheds:

1. Contractor shall fence and maintain storage yards in an orderly manner.

2. Storage for materials that cannot be stored outside may be stored within building.
3. Exact location, size and access of storage yards shall be approved by District Inspector.
4. Remove storage yards and sheds as rapidly as progress of work will permit.

G. Contractor's Parking: Contractor is responsible for parking offsite at his expense and in locations acceptable to the District and local governing authorities.

1.5 GENERAL ITEMS

A. Staging areas for delivery of materials and equipment will be at locations designated by the Project Manager.

B. Safety and Security Lighting: Provide the foot candles minimum inside building(s) and the foot candles outside that comply with Cal OSHA requirements..

C. Noise Control: Contractor shall comply with all noise ordinances of the local authorities. Additionally the Contractor shall provide suspend all operations during District testing of students, two (2) separate days anticipated.

1.6 TRENCHES

A. Open trenches for installation of utility lines (water, gas, electrical and similar utilities) and open pits outside barricaded working areas shall be barricaded at all times. Barricades, such as traffic safety type saw horses or post should be used. High visibility orange netting shall be strung between horses or posts. Trenches shall be backfilled and patch-paved within 72 hours after approval of installation by the District Inspector, or shall have "walk plates" installed.

B. Open trenches deeper than 3'-0", and not located within a public street access, shall be enclosed within an 6'-0" high chain-link fence.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

END OF SECTION 01 50 00

SECTION 01 57 23 – TEMPORARY STORM WATER POLLUTION CONTROL

PART 1 - GENERAL

1.1 The Contractor shall exercise every reasonable precaution to protect channels, storm drains, and bodies of water from pollution.

A. Conduct and schedule operations to minimize or avoid muddying and silting channels, drains, and waters.

B. As required, obtain permits for erosion and water pollution control from the appropriate jurisdictional agency before starting Work.

C. Provide any necessary water pollution control devices to prevent, control, and abate water pollution, and implement good housekeeping pollution control measures to reduce the discharge of pollutants from work sites to the maximum extent practicable. These water pollution control devices include drains, gutters, slope protection blankets and retention basins and shall be constructed concurrently with other Work at the earliest practicable time.

D. Exercise care in preserving vegetation and protecting property, to avoid disturbing areas beyond the limits of the Work. Promptly repair any damage caused by Contractor operations.

E. Comply with the specific requirements based on acreage of disturbed soil.

F. Penalties: Failure to comply with this Section may result in significant fines and possible imprisonment. The RWQCB or other prosecuting authority may assess fines of up to $32,500 per day for each violation. Should the Owner be fined or penalized as a result of the Contractor failing to comply with this Section, the Contractor shall reimburse the Owner for any and all fines, penalties and related costs.

G. Notification and Report: If pollution occurs in the work area for any reason or when the Contractor becomes aware of any violation of this Section, correct the problem and immediately notify the Inspector. In addition, submit a written report to the Engineer within seven (7) calendar days describing the incident and the corrective actions taken. If either the Inspector or Engineer is first to observe pollution or a violation, the Contractor shall also explain in the written report why the Work was inadequately monitored.

H. The provisions of this Section describe minimum compliance and do not preclude other more stringent stormwater pollution control measures that may be required in the Contract.

1.2 Definitions

A. “Construction activity": Operations such as clearing, grading, disturbances to the ground such as stockpiling, or excavation that results in soil disturbances. If construction activity is part of a larger common plan of development, the amount of disturbed soil is the total land area of disturbed soil that results under the common plan.

1.3 Liabilities & Penalties:

A. Payment of penalties for non-compliance by CONTRACTOR shall be the sole responsibility of CONTRACTOR.

B. Compliance with the Clean Water Act pertaining is the sole responsibility of CONTRACTOR. Any fine against OWNER due to non-compliance by CONTRACTOR, OWNER shall recover all costs of the fine by appropriate OWNER Assessment.

PART 2 - EXECUTION

2.1 Construction activity: Comply with the following minimum water quality protection requirements.

A. Retain eroded sediments and other pollutants on-site and do not allow transportation from the site by sheet flow, swales, area drains, natural drainage, or wind. Control slope and channel erosion by implementing an effective combination of best management practices (BMPs). Such BMPs include scheduling grading during non-rainy seasons, planting and maintaining vegetation on slopes and covering erosion-susceptible slopes.

B. Protect stockpiles of earth and other construction-related materials from being transported from the site by wind or water.

C. Properly store and handle fuels, oils, solvents, and other toxic materials to not contaminate the soil or surface waters, enter the groundwater, or be placed where they may enter a live stream, channel, drain, or other water conveyance facility. Protect all approved toxic storage containers from weather. Clean spills immediately and properly dispose of cleanup materials. Spills shall not be washed into live streams, channels, drains, or other water conveyance facilities. IF RAIN OR STORM WATER RUN OFF COMES IN CONTACT WITH POLLUTANTS (SUCH AS SOIL STABILIZERS, PAINT OR FLUID FROM VEHICLES) REPORT TO INSPECTOR IMMEDIATELY. CONTRACTOR WILL BE REQUIRED TO SAMPLE AND REMEDIATE CONTAMINATED WATER.

D. Do not wash excess or waste concrete into the public way or any drainage system. Retain concrete wastes on-site until they can be appropriately disposed of or recycled.

E. Deposit trash and construction-related solid wastes in covered receptacles to prevent contamination of rainwater and dispersal by wind.

F. Do not allow sediments and other materials to be tracked from the site by vehicle traffic. Stabilize construction entrance roadways to inhibit sediments from being deposited onto public ways. Immediately sweep up accidental depositions. Do not allow depositions to be washed away by rain or by any other means.

G. Contain non-stormwater runoff from equipment or vehicle washing and any other activity at the work site.

H. At completion of the Work, clear the worksite of debris and restore to a condition at least equal to or better than prior to construction.

PART 3 – MAINTENANCE

3.1 To ensure the proper implementation and functioning of control measures, the Contractor shall regularly inspect and maintain the construction site. The Contractor shall identify corrective actions and time needed to address any deficient measures or reinitiate any measures that have been discontinued. Inspections of the construction site shall be conducted by the Contractor to identify deficient measures, as follows:

1. Prior to a forecast storm;
2. At 24-hour intervals during extended precipitation events;
3. After all precipitation, which causes runoff capable of carrying sediment from the construction site; and;
4. Routinely, at a minimum of once every week during the rainy season (October 1st – April 30th) and once every month during non-rainy season (May 1st – September 30th).

3.2 All temporary and/or permanent post-construction control measures shall be maintained and regularly inspected by the Contractor after all improvements are in place and accepted by the Owner. Temporary and/or permanent post-construction landscaping maintenance shall include but not limited to, watering, seeding, hydro-seeding, matting, slope stabilization, re-vegetation, and any other maintenance control measures recommended by the Owner to insure proper erosion control and plant growth.

END OF SECTION 01 74 16

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PART 1 - SECTION 01 63 00 - SUBSTITUTIONS

PART 2 - GENERAL

2.1 SUMMARY

A. Section Includes: Procedures for submittal of requests for substitution for materials.

B. Related Documents: General Conditions and Division 1 are a part of this Section and the Contract for this Work and apply to this Section as if repeated fully herein.

2.2 GENERAL REQUIREMENTS

A. Submit a written request for proposed substitutions to the District's Representative according to the General Conditions.

B. Where materials or items of manufacturer are specified in groups and are made or furnished by one manufacturer, no substitution will be considered that is not made or furnished similarly by one manufacturer. Where the Contractor proposes to use a system of equipment other than that specified or detailed on the Drawings the substitution shall be proposed as a complete system.

2.3 REQUIREMENTS FOR SUBMITTING SUBSTITUTIONS:

A. Changes to approved drawings and specifications shall be made by Addenda or Construction Change Document (CCD) and approved by the Division of the State Architect as required by CCR, Title 24, Part 1, Section 4-338 (C), IRA-6. Prior to fabrication and installation.

1. Construction Change Documents must be signed by all of the following:

    a. Architect of Record
    b. Structural Engineer (where applicable)
    c. Designated Design Professional (where applicable)
    d. DSA

B. Submit written request for each proposed substitution on form shown at the end of this Section. Provide data substantiating request as well as a "Certificate of Suitability" certifying that the proposed substitution is equal or better in all respects to that specified and that it will, in all respects perform the function for which it is intended. Include with request all required samples. Submit 3 copies of all written requests and data for proposed substitutions.

C. Submit complete information to the Owner's Representative so that proper evaluation can be made. The burden of proof of equality of the substituted item shall be on the Contractor. Acceptance of such substitutions is entirely at the discretion of the Owner's Representative and District. All materials or items of manufacturer, which the Contractor proposes to substitute for those specified, must be accepted by the Owner's Representative before they may be ordered.

D. The Owner's Representative will issue to the Contractor a list setting forth those items for which substitutions are accepted. No substitution will be accepted for any materials or item of manufacture called for in the Contract Documents which is not of equal quality and utility and which does not possess equal design or color characteristics to those of the specified material or item.

E. If, in the opinion of the Owner's Representative or District, the proposed substitution is not equal or better in every respect to that so indicated or specified, or was not submitted for acceptance in the manner outlined above, the Contractor shall furnish the specified materials.

F. It shall be the responsibility of the Contractor, in proposing a substitution for any item herein specified, to inform all other trades, vendors, and subcontractors of effects said substitution will have upon their construction activities or products. Failure to so notify shall require that the Contractor make all payments arising from alterations in specified materials or methods necessary to complete the Work in an approved and acceptable manner.

PART 3 - PRODUCTS (Not Applicable)

PART 4 - EXECUTION (Not Applicable)

END OF SECTION 01 63 00

SUBSTITUTION REQUEST FORM

Re:

Project Name

Project Manual Section Number

Item

To:

Owner's Representative

From:

General Contractor

We hereby submit for your consideration the following product comparisons of the specified item and the proposed substitution:

A.	Comparison	Specified Item	Substitution
1.	Product Name/Model	_____	
2.	Manufacturer	_____	
	Address	_____	
	Phone Number	_____	
3.	Product Cost	_____	
	Installation/Labor Cost	_____	
4.	Delivery Time	_____	
	Installation Time	_____	
5.	Product Characteristics	_____	
		_____	
		_____	
		_____	
6.	Dimensions	_____	
	Effects	_____	
		_____	

7. Guarantee/Warranty _____

_____

8. ICC-ES No. _____

9. UL Rating _____

B. Substantiating Data:

Attach manufacturer's literature for both specified item and substitution.

C. Samples:

Provide samples for both specified item and substitution, if applicable.

D. Similar Projects

1. _____
Name Date

Address

2. _____
Name Date

Address

E. What Effect does this substitution have on applicable code requirements?

F. Change Data:

Attach complete information as to whether the proposed substitution:

1) Is equal in quality/service/ability to the Specified Item;
2) Will entail no changes in detail, construction, and scheduling of related work;
3) Will be acceptable in consideration of the required design and artistic effect;
4) Will provide no cost disadvantage to the District;
5) Will require no excessive or more expensive maintenance, including adequacy and availability of replacement parts; and
6) Will require no change of the construction schedule.

Submitted by:

_____
Signature Name
Title

_____

Firm Date

Address

Signature must be by persons having authority to legally bind his firm to the above terms. Failure to provide legally binding signature will result in retraction of approval.

* * * * * * *

For Use by Owner's Representative:

_____ Accepted _____ Not Accepted

Owner's Consultant:

By:

Date:

_____ Accepted _____ Not Accepted

School District:

By:

Date:

* * * * * * *

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SECTION 01 70 00 - CONTRACT CLOSEOUT

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. This Section includes administrative and procedural requirements for Contract Closeout, including but not limited to, the following:

1. Inspections.

B. Closeout requirements for specific Work activities are included in the appropriate Sections in Divisions 01 through 16.

1.2 RELATED SECTIONS

A. Section 01 30 00: Submittals

B. Section 01 40 50: Testing and Inspection

C. Section 01 50 00: Construction Facilities and Temporary Controls

D. Section 01 74 00: Warranties and Guarantees

E. Section 01 74 50: Cleaning

F. Section 01 75 00: Starting of Systems

G. Section 01 78 00: Operating and Maintenance Manuals

H. Section 01 78 50: Project Record Documents

1.3 REQUIREMENTS FOR PREPARATORY TO FINAL INSPECTION

A. Remove temporary facilities from the Project site.

B. Thoroughly clean the Buildings and Project site.

C. All plumbing and mechanical equipment shall operate quietly and free from vibrations. Properly adjust, repair, balance, or replace equipment producing objectionable noise or vibration in the occupied areas of the buildings. Provide additional brackets, bracing, or other methods to prevent objectionable noise or vibration. All systems shall operate without humming, surging, or rapid cycling.

D. Properly mount all operation instructions for equipment and post as specified in their respective Sections.

E. Job Record specifications and prints “as builts” shall be completed, signed, and submitted to the Owner’s Representative as specified in respective Specification Sections.

F. Submit to the Owner’s Representative, the material and equipment maintenance instructions, as specified in the body of the Specification Sections.

G. Submit to the Owner's Representative, all warranties, guarantees, and bonds, as specified in the body of the Specification Sections.

H. When requested, submit certificates indicating payment of all debts and Claims arising from the Work.

I. Deliver all tools which are a permanent part of equipment installed in the Work to the Owner.

J. Deliver all keys, construction and permanent, properly identified, to the Owner.

PART 2 - PRODUCTS (Not applicable)

PART 3 - EXECUTION

3.1 SUBSTANTIAL COMPLETION

A. Inspection Procedures: On receipt of a request for a certificate of Substantial Completion, Owner's Representative and/or Owner will either authorize commencement of inspection or advise Contractor of unfilled requirements. IOR, Owner's Representative, and/or Owner and Contractor will inspect the Work and Owner's Representative shall prepare a comprehensive punch list of items to be completed.

1. IOR will repeat inspection when requested by the Contractor and assure the Work is complete.
2. Results of the completed inspection will form a partial basis of the requirements for Final Completion.

B. Re-inspection Procedures: IOR, Contractor and Owner's Representative will inspect the Work upon notice the Work, including final inspection list items from earlier inspections, has been completed, except for items whose completion is delayed under circumstances acceptable to Owner's Representative.

1. Upon completion of inspection, OWNER'S REPRESENTATIVE will recommend Final Completion. If the Work is incomplete, OWNER'S REPRESENTATIVE will advise Contractor of Work that is incomplete or of obligations that have not been fulfilled but are required for Final Completion.
2. If necessary, re-inspection will be repeated, but may be assessed against Contractor if Owner is subject to additional professional service and or additional costs of inspection.

C. After all requirements preparatory to the final inspection have been completed as herein specified in the Specification Sections, the Contractor will notify the Owner's Representative and IOR to perform the final inspection.

END OF SECTION 01 70 00

SECTION 01 71 23 - FIELD ENGINEERING

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Surveying requirements for the Work.

1.02 RELATED SECTIONS

A. Section 31 20 00: Earthwork

B. Section 31 10 00: Site Clearing

1.03 SURVEY SERVICE

A. The CONTRACTOR shall provide all surveying services.

1.04 PAYMENT FOR SURVEYING

A. The payment for surveying shall be included in respective items of work and shall include, but not to be limited to, construction staking, location and/or relocation of conflicting utilities, locating survey monuments, professional office services and field calculations, and furnishing all labor, materials, tools, equipment and incidentals for doing all work involved. No additional compensation shall be allowed unless a separate bid item is provided.

PART 2 - PRODUCTS (Not applicable)

PART 3 - EXECUTION

3.01 SUBMITTALS

A. CONTRACTOR shall submit the name and address of the State of California licensed surveyor to CMR, ARCHITECT and OWNER including any changes as they may occur.

B. CONTRACTOR shall submit to OWNER and/or CMR, ARCHITECT copies of cut sheets, coordinate plots, data collector printouts, and other documentation as available to verify completeness and/or accuracy of field surveying work.

C. Statement of Compliance: CONTRACTOR shall submit a statement of certification signed and sealed by Surveyor, counter-signed by CONTRACTOR indicating compliance with grade elevations, slopes and tolerances.

D. Submit a certification, signed by the surveyor, confirming the elevations and locations of improvements are in conformance with the Contract Documents. The statement shall include survey notes for the finish floor and building pad,

showing the actual measured elevations on the completed sub-grade, recorded to the nearest 0.01'.

3.02 LAYOUT OF THE WORK

A. CONTRACTOR shall employ a State of California licensed surveyor to lay out the entire Work, set grades, lines, levels, control points, vertical and horizontal control, elevations, grids and positions. Before the commencement of Work, surveyor shall, in conjunction with OWNER and CMR provided engineering survey of the Project site, locate all reference points and benchmarks, then lay out all lines, elevations, and measurements for the entire Work including but not limited to, buildings, grading, paving and utilities.

B. All work under this contract shall be built in accordance with the lines and grades shown on the plans. Field survey for establishing these, and for the control of construction, shall be the responsibility of the Contractor. All such survey work including construction staking shall be done under the supervision of a California Licensed Land Surveyor or authorized Civil Engineer. Staking shall be done on all items ordinarily requiring grade and alignment, at intervals normally accepted by the agencies and trade involved.

C. The CONTRACTOR shall be responsible for any errors in the finished work, and shall notify the Engineer, in writing, within 24 hours, of any discrepancies, or design errors during the construction staking.

D. Contractor shall immediately remediate any areas found not to meet specification requirements.

3.03 SURVEY REQUIREMENTS

A. Establish a minimum of two permanent horizontal and vertical control points on the Project site, remote from the building area, referenced to data established by the survey control points.

B. Indicate the reference points on the project record drawings with the basis of elevation being the established benchmarks.

C. Establish lines, grades, locations and dimensions by instrumentation. From time to time, verify the layout of all Work by the same methods.

D. Provide grade stakes and elevations to construct over excavation and re-compaction, rough and final grades, paved areas, curbs, gutters, sidewalks, building pads, landscaped areas, and other areas as required.

E. Calculate and layout proposed finished elevations and intermediate control as required to provide smooth transitions between the spot elevations indicated in the Contract Documents.

F. Provide stakes and elevations for grading, fill, and topsoil placement.

G. Provide adequate horizontal and vertical control to locate utility lines, including but not limited to, storm, sewers, water mains, gas, electric and signal and provide vertical control in proportion to the slope of the line as required for accurate construction. Dry utilities will be based upon adequate horizontal and vertical control layout. Prior to trench closure, survey and record invert and flow line elevations. Survey and record top of curb and flow line elevations on finished concrete or AC surfaces at key locations such as BC's, EC's, grade breaks, corners or angle points in sufficient number to demonstrate the Work complies with the intent of the Contract Documents.

H. Provide horizontal and vertical control for batter boards for drainage, utility, and other on-site structures as required.

I. Furnish building corner offsets as required to adequately locate building pads. Provide cut and fill stakes within the building pad perimeter adequate to control both over excavation and re-compaction and the final sub-grade elevation of the building pad.

3.04 ESTABLISHMENT OF GRADES IN HARDSCAPE AREAS

A. All work shall conform to the lines, elevations, and grades shown on the Grading Plans. Three consecutive points set on the same slope shall be used together so that any variation from a straight grade can be detected. Any such variation shall be reported to the Engineer. In the absence of such report, the Contractor shall be responsible for any error in the grade of the finished work.

B. Areas having drainage gradients of 2 percent or more shall have elevation stakes, set with instrument, at grid intervals of 25 feet. Intermediate stakes may be set by using a tightly-drawn string line over the tops of adjacent stakes. Grade stakes must be set at all grade breaks, grade changes, etc.

C. Areas having drainage gradients of less than 2 percent shall have elevation stakes, set with instrument, at 10 foot intervals. Grade stakes must be set at all grade breaks, grade changes, etc.

D. Protect and maintain stakes in place until their removal is approved by the Owner. Grade or location stakes lost or disturbed by Contractor, shall be reset by the Surveyor at the expense of Contractor.

3.05 SEWER & STORM DRAIN PIPE INSTALLATION

A. All sewer and storm drain pipeline shall be staked by a licensed surveyor if slope of grade is less than 2% and a complete set of cut sheets shall be supplied to the Inspector. All construction staking shall be installed and verified for grade and alignment prior to the start of construction.

3.06 RECORD DRAWINGS

A. Upon Substantial Completion, CONTRACTOR shall obtain and pay for reproducible transparencies of the as built survey drawings. Deliver to

ARCHITECT, final “record” drawings of the original drawings and completed Work within specified tolerances.

B. Record drawings shall indicate locations by coordinate of all utilities onsite with top of pipe elevations at major grade and alignment changes, rim grate or top-of-curb and flow line elevations of all drainage structures and manholes.

C. Completed record drawing transparencies shall be signed and certified as correct and within specified tolerances by the licensed surveyor.

D. Attention is called to other sections of the Contract Documents requiring verification or measurements of installed Work by survey. Surveyor shall perform and certify all such surveys or verification are completed in accordance with the Contract Documents.

END OF SECTION 01 71 23

SECTION 01 74 00 - WARRANTIES AND GUARANTEES

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. This Section includes administrative and procedural requirements for warranties required by the Contract Documents, including manufacturers and/or installer's standard warranties on products and special product warranties.

B. Refer to General Conditions for terms of the guarantee period for the Work.

1.2 RELATED SECTIONS

A. Section 01 04 50: Cutting and Patching

B. Section 01 30 00: Submittals

C. Section 01 70 00: Contract Closeout

PART 2 - PRODUCTS (Not applicable)

PART 3 - EXECUTION

3.1 WARRANTY REQUIREMENTS

A. Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties shall not relieve Contractor of the warranty of the Work incorporating such materials, products, and/or equipment. Manufacturer's disclaimers and limitations on warranties do not relieve suppliers, manufacturers, installers, and Subcontractors of the requirement to countersign special warranties with Contractor.

B. Standard warranties are preprinted written warranties published by individual manufacturers for particular products and are specifically endorsed by the manufacturer to Owner.

C. Special warranties are written warranties required by or incorporated in the Contract Documents, either to extend time limits provided by standard warranties or to provide greater rights for Owner.

D. Related Damages and Losses: When correcting failed or defective warranted Work, remove and replace Work that has been damaged as a result of such failure or which must be removed and replaced to provide access for correction of warranted Work.

E. Reinstatement of Warranty: When Work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by written endorsement with the reinstated warranty equal to the original warranty.

F. Replacement Cost: Upon determination the Work covered by a warranty has failed and/or is defective, replace or rebuild the Work to an acceptable condition complying with requirements of the Contract Documents. Contractor is responsible for the cost of replacing or rebuilding defective Work regardless

of whether Owner has benefited from use of the Work through a portion of its anticipated useful service life.

G. Owner Recourse: Expressed warranties made to Owner are in addition to implied warranties and shall not limit the duties, obligations, rights, and remedies otherwise available under the law. Expressed warranty periods shall not be interpreted as limitations on the time in which Owner can enforce such other duties, obligations, rights, or remedies.

H. Rejection of Warranties: Owner reserves the right to reject warranties and to limit selection to products with warranties not in conflict with requirements of the Contract Documents.

I. Where the Contract Documents require a special warranty, or similar commitment on the Work or part of the Work, Owner reserves the right to refuse to accept the Work until Contractor presents evidence the entities required to countersign such commitments have done so.

3.2 SUBMITTALS

A. Submit written warranties to Owner's Representative prior to Final Completion of the Work. If the certificate of Substantial Completion designates a commencement date for warranties other than the date of Substantial Completion for the Work, submit written warranties as set forth in the certificate of Substantial Completion.

B. When a designated portion of the Work is partially used and/or occupied by Owner, submit properly executed warranties to OWNER'S REPRESENTATIVE within fifteen (15) days of the Partial Use or Occupancy of the designated portion of the Work.

C. When the Contract Documents require Contractor (s), or Contractor and a Subcontractor, installer, supplier or manufacturer to execute a special warranty, prepare a written document containing appropriate terms and identification, ready for execution by the required parties. Submit a draft to Owner, through the Owner's Representative, for approval fifteen (15) days in advance prior to final execution.

D. Refer to Divisions 02 through 16 for specific content requirements and particular requirements for submitting special warranties.

E. Form of Submittal: Prior to Final Completion of the Work, compile two copies of each required warranty properly executed by Contractor, or by Contractor and Subcontractor, installer, supplier, or manufacturer. Organize the warranty documents into an orderly sequence based on the Specifications.

F. Bind warranties and bonds in heavy-duty, commercial-quality, durable 3-ring, vinyl-covered loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8½ by 11" (115 by 280 mm) paper.

1. Provide heavy paper dividers with celluloid covered tabs for each separate warranty. Mark the tab to identify the item or installation. Provide a typed description of the product or installation, including the name of the product, and the name, address, and telephone number of the installer.
2. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project title and/or name, and name of Contractor.
3. When warranted Work requires operation and maintenance manuals, provide additional copies of each required warranty, as necessary, for inclusion in each required manual.

END OF SECTION 01 74 00

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SECTION 01 74 50 - CLEANING

PART 1 - GENERAL

1.1 DESCRIPTION

A. The CONTRACTOR shall be solely responsible for the cleaning of the Project site.

B. Keep premises, and adjacent private and public properties free from accumulation of waste, debris and rubbish caused by construction process.

C. At completion of Work, remove waste materials, rubbish, tools, equipment, machinery and surplus material, and clean all exposed surfaces. Remove remaining mock-ups and samples.

D. Leave Project clean and ready for occupancy.

1.2 RELATED SECTIONS

A. Section 01 50 00: Construction Facilities and Temporary Control.
B. Section 01 70 00: Contract Closeout

1.3 SAFETY

A. The CONTRACTOR shall be solely responsible for cleaning safety.

B. Standards: Maintain Project in accord with Federal, State, Local safety regulations, ordinances, anti-pollution laws and insurance standards.

C. Hazard Control: Maintain Project in accord with Federal, State, Local safety regulations, ordinances, anti-pollution laws and insurance standards.

D. Conduct cleaning and disposal operations to comply with Federal, State, Local safety regulations, ordinances, and anti-pollution laws.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 DURING CONSTRUCTION

A. The CONTRACTOR is solely responsible for the cleaning of all public and private property.

B. Keep premises, and adjacent private and public properties free from accumulations of waste materials and rubbish. Remove debris and dirt from public property promptly; clean sidewalks and adjacent streets daily when soiled by work performed under this Contract.

C. As often as necessary, and/or as required the CONTRACTOR shall clean site and dispose of waste materials, debris, and rubbish off the site in a legal manner. Remove all combustible materials in a legal manner.

D. Provide on-site containers for collection of waste materials, debris, and rubbish. Provide a collection can at each location used as an eating area. Pick-up and dispose of all garbage daily.

E. Remove waste materials, debris, and rubbish from site and legally dispose of at legal public or private dumping areas or recycling center off OWNER'S property.

F. Do not allow debris and combustible materials to accumulate in voids, cavities, and plenums created by wall partition, and ceiling construction. These areas must be thoroughly cleaned out before being sealed or closed off by installation of finish materials.

G. Do not allow debris to clog drains. Keep roof drains, scuppers, floor drains and area drains clean and free of debris.

H. Vacuum clean interior areas when ready to be painted, installation of carpet, installation of floor tile, etc. Refer to Sections for other provisions on preparations of finish surfaces.

I. Handle materials in a controlled manner with as few handling as possible; do not drop or throw materials from heights.

J. Schedule cleaning operations so that dust and other contaminants resulting from cleaning process will not fall on newly finished surfaces.

K. Wet down materials and rubbish to lay dust and prevent it form blowing.

3.2 FINAL CLEANING

A. Complete cleaning operations before requesting inspection for a certificate of Substantial Completion.

B. Employ experienced workers, or professional cleaners, for all final cleaning.

C. Clean each surface or unit to the condition expected in a normal, commercial building cleaning and maintenance program. Comply with manufacturer's instructions.

D. Remove labels that are not permanent labels.

E. Clean transparent materials, including mirrors and glass in doors and windows. Remove misplaced glazing compound and other substances. Replace chipped or broken mirrors, glass and other damaged transparent materials.

F. Clean exposed exterior and interior hard-surfaced finishes to a dust-free condition, free of stains, films, and similar foreign substances. Restore reflective surfaces to their original reflective condition. Leave concrete floors, walkways, and the like broom clean. Vacuum carpeted surfaces.

G. Wipe surfaces of mechanical and electrical equipment. Remove excess lubrication and other substances. Clean plumbing fixtures to a sanitary condition. Clean light fixtures and lamps.

H. Clean the site, including landscaped areas, of rubbish litter and other foreign substances.

1. Contaminated earth:

a. Final clean-up operation includes the removal and disposal of earth contaminated or unsuitable for support of plant life in planting areas, and filling of resulting excavations with suitable soil.

b. Contaminated areas include those used for disposal of waste concrete, mortar, plaster, masonry, and similar materials, areas in which washing out of concrete and plaster mixers or washing of tools and like cleaning operations have been performed, and areas that have been oiled, paved, or chemically-treated.

2. Sweep paved areas broom clean; remove stains, spills and other foreign deposits.

3. Rake grounds that are neither paved nor planted, to a smooth even-textured surface.

I. The CONTRACTOR is to keep Project clean until it is occupied by OWNER.

END OF SECTION 01 74 50

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SECTION 01 75 00 - STARTING OF SYSTEMS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Starting systems.

B. Demonstration and instructions.

1.2 RELATED SECTIONS

A. Section 01 10 00: Construction Documents

B. Section 01 40 50: Testing and Inspection

C. Section 01 70 00: Contract Close Out

PART 2 - PRODUCTS

PART 3 - EXECUTION

3.1 STARTING SYSTEMS

A. Coordinate schedule for start-up of various equipment and systems.

B. Notify OWNER'S REPRESENTATIVE, IOR and/or OWNER five (5) days prior to start-up of each item.

C. Verify that each piece of equipment of system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and/or other conditions which may cause damage.

D. Verify that tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.

E. Verify wiring and support components for equipment are complete and tested.

F. Execute start-up under supervision of responsible manufacturer's representative and CONTRACTORS' personnel in compliance with manufacturers' instructions.

G. When specified in individual specification Sections, require manufacturer to provide authorized representative to be present at site to inspect, check and approve equipment or system installation prior to start-up, and to supervise placing equipment or system in operation.

H. Submit a written report that equipment or system has been properly installed and is functioning correctly.

3.2 DEMONSTRATION

A. Demonstrate operation and maintenance of products to OWNER'S REPRESENTATIVE, OWNER, and/or others fifteen (15) days prior to date of final inspection.

B. Demonstrate Project equipment and instruct in a classroom environment located at the Project site and instructed by a qualified manufacturers' representative knowledgeable about the Project to OWNER'S REPRESENTATIVE, and OWNER.

C. For equipment or systems requiring seasonal operation, perform demonstration for other season within six (6) months.

D. Utilize operation and maintenance manuals as basis for instruction. Review contents of manual with OWNER'S personnel in detail to explain all aspects of operation and maintenance.

E. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shut-down of each item of equipment at scheduled at designated location.

F. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.

G. The amount of time required for instruction on each item of equipment and system is that specified in individual Sections.

END OF SECTION 01 75 00

SECTION 01 78 00 - OPERATING AND MAINTENANCE MANUALS

PART 1 - GENERAL

1.1 SUMMARY

A. Principal work in this Section:

1. Compilation of product data and related information appropriate for OWNER'S maintenance and operation of products furnished under the Contract.
2. Instructions of OWNER'S personnel in the maintenance of products and in the operation of equipment and systems.

B. Related work:

1. Submittals of shop drawings, product data and samples
2. Contract closeout submittals
3. Submittals of warranties

1.2 RELATED SECTIONS

A. Section 01 70 00: Contract Close Out
B. Section 01 74 00: Warranties and Guarantees
C. Section 01 78 50: Project Record Documents

1.3 SUBMITTALS

A. Preliminary:

1. Submit three (3) copies of proposed manual or manuals to the CMR, for review by ARCHITECT seven (7) days prior to request for final inspection, start-up of systems, and/or training, which ever comes first. Allow enough time for corrections and final review.
2. Show general arrangement, nature of contents in each portion or section, proposed method of binding, and covering for the manual or manuals.

B. Final:

1. Following instruction of operation and maintenance personnel, make all necessary revisions of the manual.
2. Submit specified number of copies of approved data in final form at final inspection or acceptance.
3. Distribution of final copies with be to CMR who will distribute to the OWNER.

1.4 QUALITY ASSURANCE

A. Preparation of data shall be done by personnel trained and experienced in maintenance and operation of the described products.

1.5 FORMAT

A. Prepare data in the form of an instruction manual for use by OWNER'S personnel.

B. Text: 20 lbs. white bond paper, 8 – 1/2 in. by 11 in.

C. Drawing:

1. Provide reinforced punched binder tab. Bind drawings with text.
2. Fan-fold larger drawings to size of text pages.

D. Fly-leaf: For each separate product or each piece of operating equipment provide the following.

1. Brief description of product, and major component parts of equipment.
2. Indexed tabs.

E. Cover: Identify each volume with typed or printed title **OPERATION AND MAINTENANCE INSTRUCTIONS.** List the following:

1. Title of Project.
2. Identity of separate structures as applicable
3. A brief and general identification of the subject matter covered in the manual.

F. Binders:

1. Commercial quality D-ring type three (3) ring binders with durable vinyl covers.
2. When multiple binders are used, correlate the date into related groupings.

G. Labels

1. Provide front and end spine labels for each manual clearly identified with the following information.

OPERATING AND MAINTENANCE INSTRUCTION
Name of school site
Address
City, CA. zip code

Name of Contractor
General subject of the manual
Space for approval date

1.6 CONTENT OF MANUAL

A. Table of contents:

1. List of each product required to be included, indexed to the content of the volume.
2. List, with each product, the name, address and telephone number of ;
   a. subcontractor and installer
   b. maintenance contractor, as appropriate
   c. local source of supply of parts, and replacements.

B. Product data:

1. Include only those sheets which are pertinent to the specific product.
2. Annotate each sheet to clearly identify the data applicable to the installation. Delete references to inapplicable information.

C. Drawings: Supplement product data with drawings as necessary to illustrate:

1. Relations of components parts of equipment and systems.
2. Project record drawings shall not be used as maintenance drawings.

D. Instructions:

1. Written text as required to supplement product data for the particular installation.

E. Warranties

1. Provide a copy of each warranty, guaranty, bond, and service contract issued.
2. Provide information sheet for OWNER'S personnel, giving the following information:

a. Proper procedures in the event of failure or emergency.
b. Instances which might affect the validity of warranties, guaranties, or bonds.

3. Warranties will be addressed to each Building in particular method for assurance of operations as if owned by one entity.

1.7 MANUAL FOR MATERIALS AND FINISHES

A. Instructions for care and maintenance including:

1. Manufacturer's recommendation for types of cleaning agents and methods.
2. Cautions against cleaning agents and methods which may be detrimental to the product.
3. Recommended schedule for cleaning and maintenance.

1.8 MANUAL FOR EQUIPMENT AND SYSTEMS

A. Content, for each unit of mechanical equipment and system, as appropriate:

1. Description of unit and component parts:

a. Function, normal operating characteristics, and limiting conditions.
b. Performance curves, engineering data and tests.
c. Complete nomenclature and commercial number of all replaceable
d. parts.

2. Operating procedures:

a. Start-up, break-in, routine, and normal operating instructions
b. Regulation, control, stopping, shut-down, and emergency instructions.
c. Summer and winter operating instructions.

3. Maintenance procedures:

a. Routine operations.
b. Guide to “trouble-shooting”.
c. Disassembly, repair, and reassembly.
d. Alignment, adjusting, and checking.

4. Servicing and lubrication:

a. Schedule for maintaining equipment.
b. List of manufacturer approved lubricants.

5. Manufacturer’s printed operating and maintenance instructions.
6. Description of sequence of operation by control manufacturer.
7. Original manufacturer’s parts list, illustrations, assembly drawings and diagrams required for maintenance.

a. Predicted life of parts subject to wear.
b. Items recommended to be stocked as spare parts.

8. Control diagrams by manufacturer on controls as installed in Project.
9. Coordination drawings of color-coded piping diagrams as installed by each subcontractor.
10. Charts of valve tag numbers with the location and function of each valve.
11. List of original manufacturer’s spare parts, manufacturer’s current prices and recommended quantities to be maintained in storage.

B. Content, of each electric and electronic system, appropriate:

1. Description of system and component parts.

a. Function, normal operating characteristics, and limiting conditions.
b. Performance curves, engineering data and test results.
c. Complete nomenclature and commercial number of replacement parts.

2. Circuit directories of panel boards.

a. Electrical service
b. Controls
c. Communications.

3. As-installed color coded wiring diagrams.
4. Operating procedures.

a. Routine and normal operating instructions.
b. Sequences required.
c. Special operating instructions.

5. Maintenance procedures:

a. Routine operations.
b. Guide to “trouble-shooting”.
c. Disassembly, repair, and reassembly.
d. Adjustment and checking.

6. Manufacturer's printed operating and maintenance instructions.

C. Prepare and include additional date when the need for such data becomes apparent during instruction of OWNER'S personnel.

1.9 INSTRUCTION OF OWNER'S PERSONNEL

A. Prior to final inspection of acceptance, instruct OWNER'S designated operating and maintenance personnel in the operation, adjustment and maintenance of all products, equipment, and systems installed in Project.

B. Provide services on factory-trained instructors from the manufacturer of each major item of equipment of system.

C. Operating and maintenance manual shall constitute the basis of instruction.

D. Review contents of manual(s) with personnel in full detail to explain all aspects of operations and maintenance.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

END OF SECTION 01 78 00

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SECTION 01 78 50 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. This Section specifies administrative and procedural requirements governing Project Record Documents.

1.2 RELATED SECTIONS

A. Section 01 10 00: Construction Documents
B. Section 01 30 00: Submittals
C. Section 01 40 50: Testing and Inspection
D. Section 01 70 00: Contract Closeout
E. Section 01 74 00: Warranties and Guarantees
F. Section 01 78 00: Operating and Maintenance Manuals

1.3 SUMMARY

A. Maintain one copy of the following in the CONTRACTOR'S field office at the site.

1. Contract Drawings, including DSA stamped set.
2. Complete Set of Specifications and Addenda.
3. Reviewed shop drawings.
4. Bulletins, change orders, field change authorization, request of information, and all other modifications to Contract.
5. Approved submittal.

B. File record documents apart from construction documents and maintain in clean, dry, legible condition. Make record documents available for review by IOR, ARCHITECT, OWNER, and OWNER'S representatives during regular business hours. The CONTRACTOR will use all means necessary to protect "Project Record Documents" set from deterioration, loss or damage until completion of work.

C. Do not use record documents for construction purpose.

D. Record documents will be subject to a monthly review by the OWNER'S representatives prior to approval of each progress payment.

1.4 PAYMENTS

A. The OWNERS representative's approval of current status of "Project record Documents" will be a prerequisite to the OWNER'S representative's approval of requests for progress payments and request for final payment

1. Progress Approvals: Prior to submitting each request for progress payments, secure the IOR approval of status of "Project Record Documents".

B. Final Payment: Prior to submitting request for final payment and final inspection, CONTRACTOR shall submit "Project Record Documents" set to the OWNER'S Representative and/or OWNER, with transmittal letter, in duplicate, containing date, Project title and number, CONTRACTOR'S name and address, title and number of each record document.

C. CONTRACTOR shall certify that the "Project Record Documents" are complete and accurately reflect all changes or modifications to the original Construction Documents.

D. Transmittal letters with signature of CONTRACTOR or its authorized representative shall be notarized by state authorized agent.

1.5 RECORDING

A. Promptly following Contract Award, CONTRACTOR shall secure from the OWNER'S Representative or OWNER one complete set of Specifications and Contract Drawings and clearly mark them as "Project Record Documents".

B. CONTACTOR shall keep record documents current.

C. CONTACTOR shall be responsible for maintaining and recording changes on "Project Record Documents".

D. Do not use "Project Record Documents" set for any other purpose except entry of new data and for review by the OWNERS' representatives, IOR, ARCHITECT, and/or OWNER. Maintain separate job sets for subcontractors and workers daily use.

E. CONTRACTOR shall record entries and properly dimension deviations on the record drawing within 24 hours after receipt of information of work in affected area.

F. Making entries on "Project Record Documents"

1. Use erasable colored pencils, other than blue or colors not easily seen, not ink or indelible pencil.
2. Clearly describe change by note and by graphic line as required.
3. Date all entries.
4. Call attention to entry by a "cloud" around area or areas affected.
5. In event of overlapping changes, different colors may be used for each entry.
6. RFI submissions shall be referenced on each affected sheet, Drawing and/or Shop Drawing.

1.6 RECORD DRAWINGS

A. Maintain a clean, undamaged set of blue or black line white prints of Drawings and Shop Drawings. Mark the set to show the actual installation where the installation varies substantially from the Work as originally shown. Mark which Drawing is most capable of showing conditions fully and accurately. Where Shop Drawings are used, record a cross-reference at the corresponding location on the Drawings. Provide detailed and accurate field dimensions for concealed elements that would be difficult to measure and record at a later date.

1. Utility location and depth below finished grade and/or above ceilings and attic spaces shall be fully dimensioned and indicated on record drawings. Dimensions shall be

measured from building lines or permanent landmarks and shall be triangulated to those features.

2. Dimensions shall be taken to building lines or permanent landmarks.
3. Horizontal and vertical location of underground utilities are appurtenances referenced to permanent surface improvements. Cut-off points and points of connection of utilities.
4. Location of internal utilities and appurtenances concealed in construction referenced to visible and accessible features of structure.
5. Details not on original Contract Drawing.
6. Do not permanently conceal any work until required information has been recorded.

B. Prior to Final Completion of the Work, and review of the project record drawings by ARCHITECT, the CONTRACTOR shall prepare a final set of project record drawings using reproducible Mylar (5 mil.) and electronic CAD files on CD's of all Contract Drawing. Submit final set of transparencies and CD's to OWNER'S Representative who will then forward the project record drawings to the ARCHITECT.

1. Incorporate on transparencies and AUTO CAD files all changes noted on record set. This requirement applies to all disciplines. Work shall be performed by experienced, competent draftsmen. AUTO CAD work shall be performed in the same protocol as the files provided. Identify documents as "**RECORD DRAWINGS".**

1.7 RECORD SPECIFICATIONS

A. Maintain two complete copies of the Specifications, including Addenda. Include with the Specifications two copies of other written Contract Documents, such as Change Orders and/or Construction Directives issued during construction.

1. Mark these record documents to show substantial variations in actual Work performed in comparison with the text of the Specifications and modifications.
2. Give particular attention to substitutions and selection of options and information on concealed Work that cannot otherwise be readily discerned later by direct observation.
3. Note related record document information with Product Data.
4. Prior to Final Completion of the Work, submit record Specifications to OWNER'S representative for ARCHITECT review, and for OWNER'S records.

1.8 RECORD PRODUCT DATA

A. Maintain two copies of each Product Data submittal. Note related Change Orders and Construction Directives and mark-up of record drawings and Specifications.

1. Mark these documents to illustrate significant variations in actual Work performed in comparison with information submitted. Include variations in products delivered to the Project site and from the manufacturer's installation instructions and recommendations.
2. Provide detailed and accurate information regarding concealed products and portions of Work that cannot otherwise be readily discerned later by direct observation. The CONTRACTOR should give particular attention to concealed areas of Work.
3. Prior to Final Completion of the Work, submit complete set of record Product Data to the OWNER'S Representative for the ARCHITECT'S review and for OWNER records.

1.9 RECORD SAMPLES

A. Immediately prior to Substantial Completion, CONTRACTOR shall meet with OWNER'S representative and/or OWNER, ARCHITECT at the Project site to determine which Samples are to be transmitted to OWNER for record purposes. Comply with OWNER'S representative for OWNER instructions regarding delivery to OWNER storage area.

1.10 MISCELLANEOUS RECORDS

A. Refer to other Specification sections for requirements of miscellaneous record keeping and submittals in connection with actual performance of the Work. Immediately prior to the date of Final Completion, complete and compile miscellaneous records and place in good order. Identify miscellaneous records properly and bind or file, ready for continued use and reference. Submit to OWNER'S representative for ARCHITECT review and for OWNER records.

1.11 SUBMITTALS

A. Deliver all "Project Record Documents" to OWNER'S representative at completion of Project as specified in Specification Sections.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

END OF SECTION 01 78 50

SECTION 02 07 00 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Related Documents: Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specifications, apply to this section.

B. Related Sections:

1. 01 04 50 Cutting and Patching

C. Definitions: As follows:

1. Remove: Remove and legally dispose of items except those indicated to be reinstalled, salvaged, or to remain the District's property.
2. Remove and Salvage: Items indicated to be removed and salvaged remain the District's property. Remove, clean, and pack or crate items to protect against damage. Identify contents of containers and deliver to District's designated storage area.
3. Salvage and Reuse In New Work: Remove items indicated; clean, service, and otherwise prepare them for reuse; store and protect against damage. Reinstall items in locations indicated.
4. Existing to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by the Architect, items may be removed to a suitable, protected storage location during selective demolition and then cleaned and reinstalled in their original locations.
5. Replace: Remove and legally dispose of existing item(s) indicated and install new like item(s) that conform(s) to project specifications.

D. Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain the District's property, demolished materials shall become the Contractor's property and shall be removed from the site with further disposition at the Contractor's option.

E. Record drawings at Project closeout according to Division 1 Section "Contract Closeout."

1. Identify and accurately locate capped utilities and other subsurface structural, electrical, or mechanical conditions.

F. Regulatory Requirements: Comply with local governing EPA notification regulations before starting selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction including, but not limited to, the City of Santa Ana. Comply with California Fire Code Article 87.

G. District will occupy portions of the building immediately adjacent to selective demolition area. Conduct selective demolition so that District's operations will not be disrupted. Provide not less than 72 hours' notice to District of activities that will affect District's operations.

H. District assumes no responsibility for actual condition of buildings to be selectively demolished.

I. Storage or sale of removed items or materials on-site will not be permitted.

PART 2 - PRODUCTS (Not applicable)

PART 3 - EXECUTION

3.1 GENERAL

A. Survey the condition of the building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of the structure or adjacent structures during selective demolition.

B. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.

C. Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.

D. Utility Requirements: Locate, identify, shut off, disconnect, and seal or cap off indicated utility services serving building to be selectively demolished.

1. Where utility services are required to be removed, relocated, or abandoned, provide bypass connections to maintain continuity of service to other parts of the building before proceeding with selective demolition.

E. Drain, purge, or otherwise remove, collect, and dispose of chemicals, gases, explosives, acids, flammables, or other dangerous materials before proceeding with selective demolition operations.

F. Conduct demolition operations and remove debris to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.

G. Conduct demolition operations to prevent injury to people and damage to adjacent buildings, facilities, and site improvements to remain. Ensure safe passage of people around selective demolition area.

1. Provide temporary weather protection, during interval between demolition and removal of existing construction, on exterior surfaces and new construction to ensure that no water leakage or damage occurs to structure or interior areas.
2. Protect walls, ceilings, floors, and other existing finish work that are to remain and are exposed during selective demolition operations.
3. Cover and protect furniture, furnishings, and equipment that have not been removed.

H. Provide and maintain interior and exterior shoring, bracing, or structural support to preserve stability and prevent movement, settlement, or collapse of building to be selectively demolished.

I. Use water mist, temporary enclosures, and other suitable methods to limit the spread of dust and dirt. Comply with governing environmental protection regulations.

J. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

K. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before start of selective demolition.

L. Remove structural framing members and lower to ground by method suitable to avoid free fall.

M. Promptly patch and repair holes and damaged surfaces caused to adjacent construction by selective demolition operations.

N. Where repairs to existing surfaces are required, patch to produce surfaces suitable for new materials.

O. Restore exposed finishes of patched areas and extend finish restoration into adjoining construction to remain in a manner that eliminates evidence of patching and refinishing.

P. Patch and repair floor and wall surfaces in the new space where demolished walls or partitions extend one finished area into another. Provide a flush and even surface of uniform color and appearance.

Q. Patch, repair, or rehang existing ceilings as necessary to provide an even-plane surface of uniform appearance.

R. Disposal: Promptly dispose of demolished materials. Do not allow demolished materials to accumulate on-site.

1. Do not burn demolished materials.
2. Dispose of demolished materials at designated spoil areas on District's property.
3. Transport demolished materials off District's property and legally dispose of them.

S. Sweep the building broom clean on completion of selective demolition operation.

T. Where performing contracted scope of work requires coring of existing concrete or CMU structures (including CMU Walls and concrete Floors), contractor shall obtain and document means of verifying existence and location of embedded steel reinforcing materials within said concrete and CMU assemblies. Contractor shall locate reinforcement by means of non-invasive technology such as X-ray photography for the purposes of protecting said reinforcement in place and shall not damage any reinforcement materials (rebar, etc.) unless specifically detailed as such and approved by the authority having jurisdiction.

END OF SECTION 02 07 00

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SECTION 06 10 00 - ROUGH CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY

A. Submittals: Submit the following:

1. Wood treatment data, including chemical treatment manufacturer's instructions for handling, storing, installing, and finishing treated materials.

PART 2 - PRODUCTS

A. Lumber, General: Comply with DOC PS 20 and with applicable grading rules of inspection agencies certified by the American Lumber Standards Committee's (ALSC) Board of Review. Provide dressed lumber, S4S, with each piece factory marked with grade stamp of inspection agency.

1. For exposed lumber, furnish pieces with grade stamps applied to ends or back of each piece, or omit grade stamps and provide grade-compliance certificates issued by inspection agency.

2. Provide dry lumber with 19 percent maximum moisture content at time of dressing for 2-inch nominal (38-mm actual) thickness or less, unless otherwise indicated.

B. Wood-Preservative-Treated Materials: Comply with applicable requirements of AWPA U1 (lumber) and AWPA M4 (plywood) per CBC 2303.1.8. Mark each treated item with the Quality Mark Requirements of an inspection agency approved by ALSC's Board of Review.

1. Pressure treat aboveground items with waterborne preservatives to a minimum retention of 0.25 lb/cu. ft. (4.0 kg/cu. m). After treatment, kiln-dry lumber and plywood to a maximum moisture content of 19 and 15 percent, respectively. Treat indicated items and the following:

   a. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
   b. Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.
   c. Wood framing members less than 18 inches (460 mm) above grade.
   d. Wood floor plates installed over concrete slabs directly in contact with earth.

2. Pressure treat wood members in contact with ground or freshwater with waterborne preservatives to a minimum retention of 0.40 lb/cu. ft. (6.4 kg/cu. m).

3. Complete fabrication of treated items before treatment, where possible. If cut after treatment, apply field treatment complying with AWPA M4 to cut surfaces. Inspect each piece of lumber or plywood after drying and discard damaged or defective pieces.

C. Fire-Retardant-Treated Materials: Comply with applicable requirements of AWPA C20 (lumber) and AWPA C27 (plywood). Identify fire-retardant-treated wood with appropriate classification marking of UL; U.S. Testing; Timber Products Inspection, Inc.; or another testing and inspecting agency acceptable to authorities having jurisdiction.

1. Research or Evaluation Reports: Provide fire-retardant-treated wood acceptable to authorities having jurisdiction and for which a current model code research or evaluation report exists that evidences compliance of fire-retardant-treated wood for application indicated.

2. Interior Type A: For interior locations, use chemical formulation that produces treated lumber and plywood with the following properties under conditions present after installation:

   a. Bending strength, stiffness, and fastener-holding capacities are not reduced below values published by manufacturer of chemical formulation under elevated temperature and humidity conditions simulating installed conditions when tested by a qualified independent testing agency.
   b. No form of degradation occurs due to acid hydrolysis or other causes related to treatment.
   c. Contact with treated wood does not promote corrosion of metal fasteners.

3. Exterior Type: Use for exterior locations and where indicated.

4. Inspect each piece of treated lumber or plywood after drying and discard damaged or defective pieces.

D. Dimension Lumber: Provide dimension lumber of grades indicated in the Structural Drawings.

E. For timbers of 5-inch nominal (117-mm actual) size and thicker, provide Douglas fir-larch, No. 1 grade per NLGA, WCLIB, or WWPA rules.

F. Miscellaneous Lumber: Provide No. 2 or Standard grade lumber of any species for support or attachment of other construction, including rooftop equipment curbs and support bases, cant strips, bucks, nailers, blocking, and similar members.

G. Wood-Based Structural-Use Panels: Provide plywood panels complying with DOC PS 1, "U.S. Product Standard for Construction and Industrial Plywood," in all cases.

1. Trademark: Factory mark structural-use panels with APA trademark evidencing compliance with grade requirements.

2. Plywood Backing Panels: For mounting electrical or telephone equipment, provide fire-retardant-treated plywood panels with grade, C-D Plugged Exposure 1, in thickness indicated or, if not otherwise indicated, not less than 15/32 inch (11.9 mm) thick.

H. Air-Infiltration Barrier: Asphalt-saturated organic felt complying with ASTM D 226, Type I (No. 15 asphalt felt), unperforated.

I. Fasteners: Size and type indicated. Where rough carpentry is exposed to weather, in ground contact, or in area of high relative humidity, provide fasteners with a hot-dip zinc coating per ASTM A 153 or of Type 304 stainless steel.

1. Power-Driven Fasteners: CABO NER-272.

2. Bolts: Steel bolts complying with ASTM A 307, Grade A (ASTM F 568, Property Class 4.6); with ASTM A 563 (ASTM A 563M) hex nuts and, where indicated, flat washers.

J. Metal Framing Anchors: Provide galvanized steel framing anchors of structural capacity, type, and size indicated and as follows:

1. Manufactured by Simpson or Division of the State Architect approved equal.

2. Galvanized Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A 653, G60 (ASTM A 653M, Z180) coating designation; structural, commercial, or lock-forming quality, as standard with manufacturer for type of anchor indicated.

K. Quality Assurance

1. Lumber Grading Agency: Certified by specified agency and approved by Division of State Architect.

2. Plywood Grading Agency: Certified by specified agency and approved by Division of State Architect.

3. Provide Certificate of Inspection or grade mark by an approved inspection agency on each piece of lumber and plywood, indicating compliance with applicable standards or grading rules specified in the referenced standards and this Section.

4. Provide quality mark by an approved inspection agency on each piece of preservative-treated lumber and plywood, indicating compliance with applicable standards or grading rules specified in the referenced standards and this Section.

5. Provide on-site or other approved quality control program acceptable to Architect and designed to test lumber materials prior to installation in order to demonstrate compliance with moisture content criteria.

PART 3 - EXECUTION

A. General:

1. Discard units of material with defects which might impair quality of work, and units which are too small to use in fabricating work with minimum joints or optimum joint arrangement.

2. Set carpentry work to required levels and lines, with members plumb and true to line and cut and fitted.

3. Securely attach carpentry work to substrate by anchoring and fastening as shown and as required by recognized standards.

4. Countersink nail heads on exposed carpentry work and fill holes.

5. Use common wire nails, except as otherwise indicated. Use finishing nails for finish work. Select fasteners of size that will not penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting of wood; predrill as required.

B. Wood Grounds, Nailers, Blocking And Sleepers:

1. Provide wherever shown and where required for screeding or attachment of other work. Form to shapes as shown and cut as required for true line and level of work to be attached. Coordinate location with other work involved.

2. Attach to substrates as required to support applied loading. Countersink bolts and nuts flush with surfaces, unless otherwise indicated. Build into masonry during installation of masonry work. Where possible, anchor to formwork before concrete placement.

3. Provide permanent grounds of dressed, preservative treated, key- beveled lumber not less than 1-1/2" wide and of thickness required to bring face of ground to exact thickness of finish material involved. Remove temporary grounds when no longer required.

C. Wood Furring:

1. Install plumb and level with closure strips at edges and openings. Shim with wood as required for tolerance of finished work.

2. Firestop furred spaces on walls at each floor level and at ceiling line of top story, with wood blocking or noncombustible materials, accurately fitted to close furred spaces.

3. Furring to Receive Gypsum Drywall: Unless otherwise indicated, provide 1" x 2" furring at 16" o.c., vertically.

4. Suspended Furring: Provide size and spacing shown, including hangers and attachment devices. Level to a tolerance of 1/8" in 10', except 1/4" in 10' for thick-coat plaster work.

D. Wood Framing, General:

1. Provide framing members of sizes and on spacings shown, and frame openings as shown, or if not shown, comply with recommendations of 2013 California Building. Do not splice structural members between supports.

2. Anchor and nail as shown, and to comply with 2013 California Building.

3. Firestop concealed spaces of wood framed walls and partitions, including furred spaces, at each ceiling and floor level, at intervals not exceeding 10 feet vertically, and at the ceiling line of the top story. Where firestops are not automatically provided by the framing system used, use closely-fitted wood blocks of nominal 2" thick lumber of the same width as framing members. Firestop shall be provided as delineated in Section 708.2 CBC.

E. Stud Framing:

1. General: Provide stud framing of size and spacing indicated or, if not otherwise indicated, of the following sizes and spacings. Arrange studs so that wide face of stud is perpendicular to direction of wall or partition and narrow face is parallel. Provide single bottom plate and double top plates using 2" thick members with widths equaling that of studs; except single top plate may be used for non-load-bearing partitions. Nail or anchor plates to supporting construction.

2. For exterior walls provide 2" x 6" wood studs spaced 16" o.c. unless noted otherwise on drawings

3. For interior partitions and walls provide 2" x 6" wood studs spaced 16" o.c. unless noted otherwise on drawings

4. Construct corners and intersections with not less than 3 studs. Provide miscellaneous blocking and framing as shown and as required for support of facing materials, fixtures, specialty items and trim.

5. Provide continuous horizontal blocking row at mid- height of single-story partitions over 8' high and at midpoint of multi- story partitions, using 2" thick members of same width as wall or partitions.

6. Frame openings with multiple studs and headers. Provide nailed header members of thickness equal to width of studs. Set headers on edge and support on jamb studs.

7. For non-bearing partitions, provide double-jamb studs and headers not less than 4" deep for openings 3' and less in width, and not less than 6" deep for wider openings.
8. For load-bearing partitions, provide double-jamb studs for openings 6' and less in width, and triple-jamb studs for wider openings. Provide headers of depth shown.

9. Plywood Wall Sheathing: Install plywood over all exterior walls unless noted otherwise on drawings. Thickness and nailing shall be as indicated on structural drawings.

F. Rafter and Ceiling Joist Framing:

1. Rafters: Provide member size and spacing shown. Notch to fit exterior wall plates and toe nail or use special metal framing anchors. Double rafters to form headers and trimmers at openings in roof framing (if any), and support with metal hangers. Where rafters abut at ridge, place directly opposite each other and nail to ridge member or use metal ridge hangers.

2. Provide special framing as shown for eaves, overhangs, dormers and similar conditions, if any.

3. Plywood Roof Sheathing: Install plywood over rafters or decking as indicated on drawings. Thickness and nailing shall be as indicated on structural drawings.

G. Timber Framing:

1. Provide wood beams and girders of the size and spacing shown. Install with crown edge up and provide not less than 4" bearing on supports. Provide continuous members unless shown; tie together over supports if not continuous.

2. Where built-up beams or girders of nominal 2" dimension lumber on edge are shown, fasten together with 2 rows of 16d nails spaced not less than 32" o.c. Locate one row near top edge and other near bottom edge. Locate end joints in members over supports; for continuous members, stagger ends at quarter points between supports.

3. Provide wood posts of the sizes shown. Provide metal anchoring and attachment devices as shown.

H. Installation of Construction Panels:

1. General: Comply with applicable recommendations contained in Form No. E 30F, "APA Design/Construction Guide - Residential & Commercial," for types of plywood products and applications indicated.

2. Fastening Methods: Fasten panels as indicated on plans.

I. Building Paper: Cover all wall sheathing with building paper to comply with manufacturer's printed directions.

END OF SECTION 06 10 00

SECTION 07 90 10 - JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

A. Preconstruction Joint Sealant-Substrate Tests: Submit substrate materials representative of actual joint surfaces to joint sealant manufacturer for laboratory testing of joint sealants for adhesion to primed and unprimed substrates and for compatibility with joint substrates and other joint-related materials.

B. Submittals: In addition to product data submit the following:

1. Samples of each type and color of joint sealant required.
2. Certified test reports for joint sealants evidencing compliance with requirements.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Compatibility: Provide joint sealants, joint fillers, and other related materials that are compatible with one another and with joint substrates under service and application conditions, as demonstrated by testing and field experience.

B. Colors: Provide color indicated of exposed joint sealants or, if not otherwise indicated, as selected by District=s Representative from manufacturer's standard colors.

C. Elastomeric Sealant Standard: Provide manufacturer's standard chemically curing, elastomeric sealant of base polymer indicated complying with ASTM C 920 requirements.

1. “Use” definitions:

a. Use “T” : Joint in traffic areas.
b. Use “NT” : Joint in nontraffic areas.
c. Use “M” : Sealant tested on mortar.
d. Use “G” : Sealant tested on glass.
e. Use “A” : Sealant tested on aluminum.
f. Use “O” : Sealant tested on substrates on than above standards.

2. Sealant No. 1: Multi-component Polyurethane Sealant; Type M; Grade NS; Class 25, Uses NT, M, A, O.

a. Provide one of the following products:

1) Dymeric: Tremco, Inc.,
2) Dynatrol II: Pecora Corp.,
3) Permapol RC-2: Products Research & Chemical Corp.,
4) Or equal.

3. Sealant No. 2: One-component Polyurethane Sealant; Type S; Grade NS; Class 25, Uses NT, M, A, O.

a. Provide one of the following products:

1) Dymeric: Tremco, Inc.,
2) Dynatrol I: Pecora Corp.,
3) Permapol RC-1: Products Research & Chemical Corp.,
4) Or equal.

4. Sealant No. 3: Silicone rubber based one-part non-acid curing sealant; Type S; Grade NS; Class 25, Uses NT, G, A, O.

   a. Provide one of the following products:

      1) Dow Corning 790; Dow Corning Corp.,
      2) Rhodorsil 5C; Rhone-Pouleng Inc.,
      3) Silpruf SCS 2000; General Electric,
      4) Spectrum 2; Tremco,
      5) Or equal.

5. Sealant No. 4: Acrylic terpolymer, solvent based, one-part, thermoplastic sealant compound;; Type S; Grade NS; Uses NT, M, A, O; recommended by manufacturer for general use as an exposed building construction sealant.

   a. Provide one of the following products:

      1) One Part Acrylic; Dap Inc.,
      2) Mono; Tremco, Inc.,
      3) 60+ Unicrylic; Pecora Corp.,
      4) Or equal.

6. Sealant No. 5: Two-component Polyurethane Sealant; Type M; Grade P; Class 25, Use T.

   a. Provide one of the following products:

      1) N.R. - 200 Urexpan; Pecora Corp.
      2) Sonolastic Paving Joint Sealant; Sonneborn,
      3) THC-900; Tremco, Inc.,
      4) Or equal.

7. Sealant No. 6: Butyl Rubber Sealant; solvent-based with minimum 75% solids, non-sag consistency, tack-free time of 24 hours or less, paintable, non-staining; complying with FS TT-S-001657.

   a. Provide one of the following products:

      1) BC-158 Butyl Rubber; Pecora Corp.,
      2) Butly Flex; Dap, Inc.,
      3) Tremco Butyl Sealant; Tremco, Inc.
      4) Or equal.

8. Sealant No. 7: Mildew-Resistant One-Part Silicone Rubber Sealant; Type S; Grade NS; Class 25, Uses NT, A, O; compounded specifically for mildew resistance and recommended by manufacturer for interior joints in wet areas; passing ANSI A136.1 test for mold growth.

   a. Provide one of the following products:

1) Tremco Proglaze; Tremco, Inc.,
2) Dow Corning 786: Dow Corning Corp.,
3) Silicone Sanitary 1702 Sealant; General Electric Co.,
4) Or equal.

9. Compressible Joint Filler: Manufacturer's standard open-cell, flexible foam strip of polyurethane or other weather resistant foam, saturated with butylene or other nondrying liquid sealant/adhesive, to a formulation which will form a paintable watertight joint at 50% compression, without staining, migrating, hardening or other performance failure.

a. Sandell Mfg. Co. APoly-tite@, (617) 491-0540,
b. Or equal (no known equal).

10. Sealant Backings, General: Nonstaining; compatible with joint substrates, sealants, primers, and other joint fillers; approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

a. Plastic Foam Joint Fillers: Preformed, compressible, resilient, nonwaxing, nonextruding strips of plastic foam of material indicated below, and of size, shape, and density to control sealant depth and otherwise contribute to producing optimum sealant performance.

1) Open-cell polyurethane foam.
2) Closed-cell polyethylene foam, nonabsorbent to liquid water and gas, nonoutgassing in unruptured state.
3) Proprietary, reticulated, closed-cell polymeric foam, nonoutgassing, with a density of 2.5 pcf and tensile strength of 35 psi per ASTM D 1623, and with water absorption less than 0.02 gram/cubic centimeter per ASTM C 1083.
4) Any material indicated above.

b. Elastomeric Tubing Joint Fillers: Neoprene, butyl, EPDM, or silicone tubing complying with ASTM D 1056, nonabsorbent to water and gas, and capable of remaining resilient at temperatures down to -26 deg F (-32 deg C).
c. Bond-Breaker Tape: Polyethylene tape or other plastic tape as recommended by sealant manufacturer for preventing bond between sealant and joint filler or other materials at back of joint.

11. Primer: As recommended by joint sealant manufacturer where required for adhesion of sealant to joint substrates indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint sealant performance. Do not proceed with installation of joint sealants until unsatisfactory conditions have been corrected.

B. Preparation

1. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with recommendations of joint sealant manufacturer and the following requirements:

a. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
b. Clean concrete, masonry, unglazed surfaces of ceramic tile, and similar porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air.
c. Remove laitance and form release agents from concrete.
d. Clean metal, glass, porcelain enamel, glazed surfaces of ceramic tile, and other nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.

2. Joint Priming: Prime joint substrates where indicated or where recommended by joint sealant manufacturer based on preconstruction joint sealant-substrate tests or prior experience. Apply primer to comply with joint sealant manufacturer's recommendations. Confine primers to areas of joint sealant bond; do not allow spillage or migration onto adjoining surfaces.
3. Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

C. Installation of Joint Sealants:

1. General: Comply with joint sealant manufacturer's printed installation instructions applicable to products and applications indicated, except where more stringent requirements apply.
2. Sealant Installation Standard: Comply with recommendations of ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
3. Acoustical Sealant Application Standard: Comply with recommendations of ASTM C 919 for use of joint sealants in acoustical applications as applicable to materials, applications, and conditions indicated.
4. Installation of Sealant Backings: Install sealant backings to comply with the following requirements:

a. Install joint fillers of type indicated to provide support of sealants during application and at position required to produce the cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

1) Do not leave gaps between ends of joint fillers.
2) Do not stretch, twist, puncture, or tear joint fillers.
3) Remove absorbent joint fillers that have become wet prior to sealant application and replace with dry material.

b. Install bond breaker tape between sealants where backer rods are not used between sealants and joint fillers or back of joints.

5. Installation of Sealants: Install sealants by proven techniques that result in sealants directly contacting and fully wetting joint substrates, completely filling recesses provided for each joint configuration, and providing uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability. Install sealants at the same time sealant backings are installed.
6. Tooling of Nonsag Sealants: Immediately after sealant application and prior to time skinning or curing begins, tool sealants to form smooth, uniform beads of configuration indicated, to eliminate

air pockets, and to ensure contact and adhesion of sealant with sides of joint. Remove excess sealants from surfaces adjacent to joint. Do not use tooling agents that discolor sealants or adjacent surfaces or are not approved by sealant manufacturer.

a. Provide concave joint configuration per Figure 5A in ASTM C 1193, unless otherwise indicated.

D. Cleaning: Clean off excess sealants or sealant smears adjacent to joints as work progresses by methods and with cleaning materials approved by manufacturers of joint sealants and of products in which joints occur.

E. Protection: Protect joint sealants during and after curing period from contact with contaminating substances or from damage resulting from construction operations or other causes so that they are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so that and installations with repaired areas are indistinguishable from original work.

END OF SECTION 07 90 10

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SECTION 09 65 00 - RESILIENT FLOORING

PART 1- GENERAL

1.1 Summary: This Section includes the following:

A Resilient Flooring

B Resilient Wall Base

C Edge trim and accessories

1.2 Submittals:

A Product data for each type of product specified.

1 Certification by flooring manufacturer that products supplied for tile installation comply with local regulations controlling use of volatile organic compounds (VOC's).

B Samples:

1 Manufacturer's standard sample units of flooring showing full range of colors and patterns available for each type of flooring indicated.

2 Heat-Welded Seam Samples: For each flooring product and welding bead color and pattern combination required; with seam running lengthwise and in center of 6-by-9-inch. Sample applied to a rigid backing and prepared by Installer for this Project.

C Calcium chloride test results.

D Maintenance data for each flooring product to include in Operating and Maintenance Manual specified in Division 1.

1.3 Quality Assurance:

A Resilient Flooring shall be stable, Firm, and slip resistant. CBC Section 11B-302.1

B Single-Source Responsibility for Flooring: Obtain each type, color, and pattern of flooring from a single source with resources to provide products of consistent quality in appearance and physical properties without delaying progress of the Work.

C Fire Performance Characteristics: Provide resilient flooring with the following fire performance characteristics as determined by testing products per ASTM test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.

1 Critical Radiant Flux: 0.45 watts per sq. cm or more per ASTM E 648.

2 Smoke Density: Less than 450 per ASTM E 662.

D Coefficient of Friction: Provide resilient flooring demonstrating a coefficient of friction of at least 0.6 per ASTM D 2047 complying with CBC Section 1124B.1/ADA Standards 4.5.1.

E Delivery, Storage, and Handling:

1 Deliver tile flooring and installation accessories to Project site in original manufacturer's unopened cartons and containers each bearing names of product and manufacturer, Project identification, and shipping and handling instructions.

2 Store flooring materials in dry spaces protected from the weather with ambient temperatures maintained between 50 deg F (10 deg C) and 90 deg F (32 deg C).

3 Store flooring on flat surfaces. Move flooring and installation accessories into spaces where they will be installed at least 48 hours in advance of installation.

F Project Conditions

1 Substrate Conditions: Moisture vapor emission of 5 lb. per 1000 square feet or less. pH of 9 or less.

2 Maintain a minimum temperature of 70 deg F (21 deg C) in spaces to receive flooring for at least 48 hours prior to installation, during installation, and for not less than 48 hours after installation.

3 After this period, maintain a temperature of not less than 55 deg F (13 deg C).

4 Do not install flooring until it is at the same temperature as the space where it is to be installed.

5 Close spaces to traffic during tile installation.

G Sequencing and Scheduling:

1 Install flooring and accessories after other finishing operations, including painting, have been completed.

2 Do not install flooring over concrete slabs until the slabs are sufficiently dry to bond with adhesive as determined by tile manufacturer's recommended bond and moisture test.

H Extra Materials: Deliver extra materials to District. Furnish extra materials matching products installed as described below, packaged with protective covering for storage and identified with labels clearly describing contents.

1 Floor Tile: Furnish not less than one box for each 50 boxes or fraction thereof, of each class, wearing surface, color, pattern and size of resilient floor tile installed.

PART 2- PRODUCTS

2.1 Resilient Flooring

A Manufacturer:

1 Armstrong: P O Box 3001, Lancaster, PA 17604. Web: www.armstrong.com. Phone: 1-877-ARMSTRONG.

2 Local contact: Collins & Aikman Floorcoverings, DBA Tandus: 1231 East Dyer Road, Suite 155; Santa Ana, California 92705. Contact; Mr. Jack Vombaur, account executive or Ms. Raelene Barress, Assistant. Phone: 1-800-241-4902 x1605

B Series: Marmorette with NATURECote.

C Form: Sheet - 6.5 feet wide x 98.4 feet maximum length.

D Fire test data:

1 ASTM E 648: Critical radiant flux, class I: 0.45 or more watts/cm2.

2 ASTM E 662: Smoke developed 450 or less.

E Static load limit: ASTM F 970 (modified): 250 psi.

F Gauges: 0.100 in overall (nominal)

G Color: As selected by Architect from Manufacturer's Standard line of patterns including the following:

1 Blue bird #LP049

2 Sand #LP092

3 Silver Gray #LP050

4 Light Chocolate #LP065

2.2 Resilient Base and Accessories

A Manufacturer:

1 VPI Corporation, P O Box 451, Sheboygan, WI 53082-0451. Web: www.vpiflooring.com. Phone: 1-800-874-4240, Fax: 1-920-458-1368. E-mail: floor@vpicorp.com

2 Local contact: & Aikman Floorcoverings, DBA Tandus: 1231 East Dyer Road, Suite 155; Santa Ana, California 92705. Contact; Mr. Jack Vombaur, account executive or Ms. Raelene Barress, Assistant. Phone: 1-800-241-4902 x1605

B Rubber wall base: Base per ASTM F 1861-02 – VPI thermoplastic rubber wall base, type “TP”. Top-set, cove or straight base, 2 ½, 4 or 6 inches high as indicated on the drawing documents. If not indicated district standard is 6” high top-set base. Base to be 1/8” thick.

C Color: To be selected, by the architect, from one of four District selected “standard” colors:

1 Inkwell #21

2 Chocolate #64

3 Jet #01

4 Burnt Umber #54

D Manufacturing Tolerances

1 Precision control gauge to assure smooth surface with no high edges.

2.3 Installation Accessories:

A Trowel able Underlayment's and Patching Compounds: Latex-modified, Portland-cement-based formulation provided or approved by flooring manufacturer for applications indicated.

B Adhesives (Cements): Water-resistant type recommended by tile manufacturer to suit resilient flooring products and substrate conditions indicated.

1 Resilient Adhesive: Provide W.F. Taylor, phone 1-909-360-6677, or equal, Envirotec low VOC adhesive, Series as recommended by manufacturer. Adhesive VOC emissions shall not exceed maximum 0.60 mg/square meter/hour after 24 hours per EPA D.E.C. Testing method. Confirm adhesive compatibility with resilient flooring manufacturer prior to installation.

2 Wall base adhesive: VPI number 600 acrylic copolymer wall base adhesive. 0 calculated VOCs.

C Moisture vapor and pH reducer: Water based, penetrating, in-organic topical slab treatment

1 Water Vapor Transmission: ASTM E 96, 1.33 grains/hr/sq ft

2 Alkali Resistance: ASTM D 1308, pass.

3 Adhesion Strength: ASTM D 4541, 500 psi

D Edging Strips: Extruded aluminum with mill finish, of height required to protect exposed flooring edge, and in maximum lengths to minimum running joints.

PART 3- EXECUTION

3.1 Examination:

A General: Examine areas where installation of flooring will occur, with Installer present, to verify that substrates and conditions are satisfactory for flooring installation and comply with flooring manufacturer's requirements and those specified in this Section.

B Moisture Testing

1 Conduct anhydrous calcium chloride testing using prepackaged kit systems approved by flooring manufacturer. Contractor shall employ an independent testing service or lab for moisture testing procedure, including placement and removal. Testing service shall be acceptable to Architect.

2 Provide test at coverage rate required by flooring manufacturer, with minimum of 3 tests/first 1,000 square feet and 1 test per each 1,000 square feet after. Distribute uniformly throughout building. Prepare map or diagram of test locations in each building.

3 Conduct one set of tests 60 days prior to scheduled flooring installation. Submit test results to Architect within 48 hours of test receipt.

4 Conduct second set of tests 14 days prior to scheduled flooring installation. Submit test results to Architect within 48 hours of test receipt.

5 Submit testing to Architect prior to beginning slab preparation or flooring work.

C Evaluate existing floor surface. Prepare surface and apply underlayment to all floor surfaces exhibiting the following characteristics:

1 Cracks, gouges or holes exceeding 1/16 inch in any dimension.

2 Cracks with adjacent surfaces exceeding 1/16 inch in height.

3 All expansion, weakened plane or construction joints.

4 All surfaces exhibiting rough or abraded texture exceeding 1/16 inch amplitude.

5 All surfaces with gap exceeding 3/16 inch under 10 foot metal straight edge.

D Provide approved underlayment over all plywood sub-floor conditions, alternating joints.

E Prepare existing concrete substrate as recommended by manufacturer, including mechanical shot-blasting or equivalent.

1 Acid etching is not acceptable.

2 Prepare existing cracks in substrate as recommended by manufacturer.

3 Apply filler and trowel to leave a smooth, flat, hard surface.

4 Prohibit traffic from area until filler is cured. Vacuum clean substrate.

F Clean floor and base surfaces and buff floor WITHOUT use of waxes or sealers in accordance with manufacturer's instructions.

G Substrates: Verify that substrates comply with ASTM F 710 and the following:

1 Moisture vapor emission of 5 lb. per 1000 square feet or less. pH of 9 or less.

2 Substrates are dry and free of curing compounds, sealers, hardeners, and other materials whose presence would interfere with bonding of adhesive.

3 Substrates are free of cracks, ridges, depressions, scale, transitions, and foreign deposits of any kind.

H Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 Preparation:

A General: Comply with manufacturer's installation specifications to prepare existing and new

substrates indicated to receive flooring.

B Remove coatings, including curing compounds, and other substances that are incompatible with flooring adhesives and that contain soap, wax, oil, or silicone, by using a commercially available wax stripper.

C Apply moisture vapor and pH reducer per manufacturer's recommendations if moisture vapor emissions are greater than 5 lb. per 1000 square feet or pH is greater than 9.

D Evaluate existing floor surface. Prepare surface and apply underlayment to ALL floor surfaces exhibiting the following characteristics:

1 Cracks, gouges or holes exceeding 1/16 inch in any dimension.

2 Cracks with adjacent surfaces exceeding 1/16 inch in height.

3 All expansion weakened plane or construction joints.

4 All surfaces exhibiting rough or abraded texture exceeding 1/16 inch amplitude.

5 All surfaces with gap exceeding 3/16 inch under 10 foot metal straight edge.

E Broom or vacuum clean new and existing substrates to be covered by flooring immediately before flooring installation. Examine substrates for moisture, alkaline salts, carbonation, or dust.

3.3 Installation:

A General:

1 Comply with manufacturer's installation directions and other requirements indicated that are applicable to each type of flooring installation included in Project.

2 Where demountable partitions and other items are indicated for installing on top of finished flooring , install flooring before these items are installed.

3 Scribe, cut, and fit flooring to butt tightly to vertical surfaces, permanent fixtures, built-in furniture including cabinets, pipes, outlets, edgings, thresholds, and nosings.

4 Extend tiles into toe spaces, door reveals, closets, and similar openings.

5 Install flooring on covers for telephone and electrical ducts, and similar items occurring within finished floor areas. Maintain overall continuity of color and pattern with pieces of flooring installed on these covers. Tightly adhere edges to perimeter of floor around covers and to covers.

6 Tightly cement flooring to substrates without producing open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, or other surface imperfections in completed tile installation. Hand roll flooring to assure adhesion.

B Resilient Wall Base: Apply wall base to walls, columns, pilasters, casework and other permanent fixtures in rooms or areas where base is required. Install base in lengths as long as practicable, with preformed corner units. Tightly bond base to substrate throughout length of each piece, with continuous contact at horizontal and vertical surfaces.

1 On irregular surfaces, fill voids behind base and along top edge with manufacturer's recommended adhesive filler.

2 Install coved base at resilient tile flooring unless indicated otherwise.

3 Install coved base at direct glue-down carpet.

4 Install base on floor mounted fixed casework.

3.4 Cleaning and Protection:

A Perform the following operations immediately after completing flooring installation:

1 Remove visible adhesive and other surface blemishes using cleaner recommended by flooring manufacturers.

2 Sweep or vacuum floor thoroughly.

3 Do not wash floor until after time period recommended by flooring manufacturer.

4 Damp-mop flooring to remove black marks and soil.

B Protect flooring against mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period. Use protection methods indicated or recommended by flooring manufacturer.

1 Apply manufacturer recommended floor polish to flooring surfaces that are free from soil, visible adhesive, and surface blemishes.

2 Cover flooring with undyed, untreated building paper until inspection for Substantial Completion.

3 Do not move heavy and sharp objects directly over flooring. Place plywood or hardboard panels over tiles and under objects while they are being moved. Slide or roll objects over panels without moving panels.

C Clean flooring not more than 4 days prior to dates scheduled for inspections intended to establish date of Substantial Completion in each area of Project. Clean flooring using method recommended by manufacturer.

1 Strip protective floor polish that was applied after completing installation prior to cleaning.

2 Reapply two coats of District provided floor polish after cleaning.

END OF SECTION

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SECTION 09 68 16 – SHEET CARPETING

PART 1- GENERAL

1.1 SUMMARY

A This Section includes Carpeting / VCTT (Vinyl Cushion Tufted Textile), installation, and accessories.

1.2 RELATED SECTIONS

A The following sections contain requirements that relate to this Section:

1 Section 09650 - Resilient Flooring - Resilient Wall Base

1.3 SUBMITTALS:

A Product data for each type of carpet material and installation accessory required. Submit written data on physical characteristics, durability, resistance to fading, and flame resistance characteristics.

B Shop drawings showing layout and seaming diagrams. Indicate pile or pattern direction and locations and types of edge strips. Indicate columns, doorways, enclosing walls or partitions, built-in cabinets, and locations where cutouts are required in carpet. Show installation details at special conditions.

C Samples for verification purposes in manufacturer's standard size, showing full range of color, texture, and pattern variations expected. Prepare samples from same material to be used for the Work. Submit the following:

1 12-inch-square samples of each type of carpet material required.

2 12-inch-long samples of each type exposed edge stripping and accessory item.

D Certificate:

1 Submit a certificate from carpet manufacturer that materials supplied comply with fire hazard resistance standards specified.

2 Submit a manufacturer certification that the Installer(s) is approved by the manufacture to install the specified product.

E Installer’s/Subcontractor’s Experience Qualifications: Submit list of not less than 5 projects with similar scope of work, extending over period of not less than 5 years, indicating installer’s experience record.

F Calcium chloride test results.

1.4 QUALITY ASSURANCE

A Comply with the following as a minimum requirement:

1 Carpet shall be securely attached and shall have a firm cushion, pad, or backing or no cushion or pad. It shall have a level loop, textured loop, level cut pile, or level cut/uncut pile texture. Pile height shall be ½" maximum. CBC Section 11B-302.2

2 Exposed Edges shall be fastened to floor surfaces and shall have trim on the entire length. Carpet edges shall comply with CBC Section 11B-303. CBC Section 11B-302.2

3 Manufacturer's installation instructions.

B Requirements of Regulatory Agencies: Carpeting shall meet requirements of federal, state and local regulatory agencies for flammability, static control, or other properties as specified, with testing documentation from the manufacturer by a third party laboratory.

C Carpet Installation: Comply with CRI 104 - Standard for Installation of Textile Floor Covering Materials.

D Each color of carpet shall be of the same dye lot.

E Pre-Installation and Progress meetings: Prior to start of work of this section and after approval of submittals, schedule an on site Pre-Installation between Contractor, Supervising Installer, OAR and IOR to review construction drawings and installation procedures in accordance with the requirements of this specification.

1.5 DELIVERY, STORAGE AND HANDLING

A Full or cut rolls of carpeting shall be cut, packaged and identified by the factory. Distributor, dealer, or vendor cutting, re-packaging, and re-labeling is not permitted.

B Store material at least 24 hours at room temperature prior to installation and in accordance to all manufacturer's instructions.

C Deliver fire-rated materials with testing agency labels and required fire classification numbers attached and legible.

1.6 JOB CONDITIONS

A Ventilation and Temperature: Verify areas to be carpeted are ventilated to remove fumes from installation materials, and areas are within temperature range recommended by the various material manufacturers for Project site installation conditions. The temperature of a concrete slab must be stabilized above 65 degrees both 12 hours prior to and after the installation. The following environmental conditions inside the building are critical for proper installation. Temperature must be between 65 degrees F and 95 degrees F and the humidity between 10% and 65% for at least 72 hours before and 72 hours after installation. In addition, any adhesives, edge sealers and seam sealers should be stored under these conditions for a minimum of 24 hours prior to installation.

B Protection: Prohibit traffic on carpet for at least 12 hours after installation. Cover carpet with heavy non-staining kraft paper in areas where the Work of other trades is to be performed and/or traffic and passage areas. Protect carpet from damage or soiling. Maintain protection in place until Substantial Completion.

C Substrate Conditions: Moisture vapor emission of 5 lb. per 1000 square feet or less. pH of 9 or less.

1.7 EXTRA MATERIALS

A Deliver extra materials to Owner. Furnish extra materials matching products installed as described below, packaged with protective covering for storage and identified with labels describing contents.

1 Carpet: Before installation begins, furnish quantity of full width for each type of material equal to 5 percent of amount installed.

1.8 WARRANTY

A Provide manufacturers standard, printed 25 year non pro-rated warranty against the following defects for the stated period after acceptance of installation:

1 Edge Ravel: No edge ravel based on normal use, wet and dry condition of use, and without use of seam sealers for lifetime of material.

2 Secondary Back Adhesion: The cushion and backing system will have no delamination based on normal use for the life of the installation.

3 Tuft Bind: No edge raveling, yarn zippering or yarn pulls as determined by the non-prorated warranty.

4 Excessive Static Electricity, defined as exceeding 3.0 Kilovolts at 20% RH and 70 degrees F per AATCC 134 for lifetime of material.

5 Manufacturers published warranty for stain release.

6 Manufacturers published warranty for colorfastness.

B Use of chair pads shall not be a pre-condition for warranty coverage

C Carpeting exhibiting defects as defined shall be replaced or repaired by the manufacturer. Secondary warranties involving those other than the manufacturer are not acceptable.

1.9 CONTRACTOR GUARANTY

A Provide guaranty, in Owner's Representative approved form, against the following defects for a period of 5 years after acceptance of installation:

1 Doming, wrinkling or delamination from substrate.

2 Separation, lifting, puckering or other seam defects.

3 Loose yarn tufts, strays or other yarn pieces at seams or edges.

PART 2- PRODUCTS

2.1 MANUFACTURERS

A Basis of Design: Characteristics of specific products manufactured by Collins & Aikman Floorcoverings Inc DBA Tandus are indicated to establish required level of quality, appearance, and performance. The Owner's Representative may consider comparable products by alternate manufacturers listed in this Section, and requests for substitutions, under the provisions of the General Conditions and Division 1 Specification Sections.

2.2 CARPET

A Type: VCTT / Vinyl Cushion Tufted Textile. The wear layer will be Anton type 6.6. The backing will be vinyl cushion with a pre-applied adhesive to 100% of the backing.

B Series: Powerbond.

1 Style:

a C&A "Aragon", Blue Shadow: 6' Powerbond cushion RS

C Construction:

1 Minimum gauge/stitch count: 1/12 inch / 9.5 stitches per inch.

2 Wear layer minimum weight: 18 oz face weight

3 Product density: factor 10,588

4 Pile Height: 0.117 inch average

5 Wear Layer: DuPont Type 6.6, Antron Legacy and Lumina BCF Nylon with Ensure soil resistant treatment.

a Alternate yarn manufacturers are not acceptable.

D Backing:

1 Primary: synthetic / non-woven.

2 Secondary: vinyl cushion Powerbond with pre-applied adhesive to 100% of the backing at the time of manufacturing.

E Fire/Habitability Criteria

1 Critical Radiant Flux: Minimum 0.45 w/sq cm per ASTM E 648, (Class 1 per UFC Appendix IV).

2 Smoke Density: 450 or less, per ASTM E 662.

3 Static Propensity: 3.0 KV or less per AATCC 134.

4 Air quality:

a Comply with State of California criteria for indoor air criteria, including VOC and particle emissions or approved equivalent test standard.

b No detectable levels of formaldehyde or 4-PC.

2.3 ACCESSORIES

A Adhesives: None, the carpet manufacturer is to apply adhesive to 100% of the backing (RS dry adhesive system).

B Primers (where required): Water based, of types recommended by carpet manufacturer, free of 4-PC. Solvent based products not permitted.

C Seam sealer: Type as recommended by carpet manufacturer.

D Transition Strip: Johnsonite, vinyl type, #CTA-xx-A, color as selected.

2.4 OTHER MATERIALS

A Provide all other materials, not specifically described but required for complete and proper installation of this work, as selected by the contractor and subject to the approval of the Owner's Representative.

PART 3- EXECUTION

3.1 EXAMINATION

A Before installation is started, examine surfaces to receive carpet. Deficiencies shall be corrected before starting Work of this section.

B Field verify dimensions and other conditions affecting this Work before commencing carpet installation.

3.2 PREPARATION

A Moisture testing

1 Conduct anhydrous calcium chloride testing using prepackaged kit systems approved by flooring manufacturer.

2 Provide test at coverage rate required by flooring manufacturer, with minimum of 3 tests/first 1,000 square feet and 1 test per each 1,000 square feet after. Distribute uniformly throughout building. Prepare map or diagram of test locations in each building.

3 Conduct one set of tests 60 days prior to scheduled flooring installation. Submit test results to Owner's Representative within 48 hours of test receipt.

4 Conduct second set of tests 14 days prior to scheduled flooring installation. Submit test results to Owner's Representative within 48 hours of test receipt.

5 Submit testing to Owner's Representative prior to beginning slab preparation or flooring work.

6 Evaluate floor surface. Prepare surface and apply filler to all floor surfaces exhibiting the following characteristics:

1 Cracks, gouges or holes exceeding 1/16 inch in any dimension.

2 Cracks with adjacent surfaces exceeding 1/16 inch in height.

3 All expansion weakened plane or construction joints.

4 All surfaces exhibiting rough or abraded texture exceeding 1/16 inch amplitude.

5 All surfaces with gap exceeding 3/16 inch under 10-foot metal straight edge.

B Filler Installation:

1 Prepare existing concrete substrate as recommended by filler manufacturer, including mechanical shot-blasting or equivalent.

2 Acid etching is not acceptable.

3 Prepare existing cracks in substrate as recommended by manufacturer.

4 Apply filler and trowel to leave a smooth, flat, hard surface.

5 Prohibit traffic from area until filler is cured. Vacuum clean substrate.

C Floor Preparation:

1 Remove all outlet floor plates and utility covers, doorstops, and similar components. Label and store for re-installation.

2 Remove all curing compounds, waxes, grease, paint and other coatings. Vacuum substrate clean. Damp mop to remove dust that may remain after first vacuuming, allow surface to dry, and again vacuum; repeat procedure if necessary to eliminate all dust. Do not furnish oiled or chemical treated sawdust or any similar product for dust removal.

3 Apply primers as recommended by carpet manufacturer.

3.3 INSTALLATION

A General: Install carpet in accordance with requirements of CRI 104, except where more stringent requirements are specified herein or recommended by carpet materials manufacturers.

B Install carpet rolls in each dye lot in the number sequence as furnished by manufacturer. Roll out carpet in one direction and do not reverse direction at any locations. Align carpet with centerline of room or space, and adjust at edges for wall variations.

C Color Control: Install dye lot in the number sequence at locations indicated to prevent shading variations. Install only one dye lot for each area of building unless otherwise reviewed. If more than one dye lot is required, obtain prior review of color match between dye lots and, Owner’s written approval.

D Carpet Runs: Install carpet in one-piece lengths between permanent walls unless otherwise required. Seams are permitted only where shown on the layout Shop Drawings. Install corridor carpet in one-piece sizes for full length and width, cross seaming only where corridors change direction.

E Laying and Seaming: Cut carpet for seams between tuft rows and prevent damage to tufts or loops, prevent edge ravels, and preserve uniform tuft row alignment and spacing on both sides and across seams. Install carpet with tuft or loop rows in straight lines both ways, free of offsets, waviness, distortion, or misalignment. Cut seam edges straight and square with backing. Trim carpet at walls, columns, and penetrations for a compressed fit.

F Doorways: Extend carpet (Permanent Mats) into doorways without piecing in and seam to the carpet on other side of door under door centerline except where metal thresholds occur; no small filler pieces of carpet will be permitted at doorways.

3.4 PERMANENT MATS

A Material Geometric Tile Triad Mat Series (Collins & Aikman Floorcoverings Inc DBA Tandus)

B Size 18” x 18”

C Backing: Special non-thermoplastic tri-grip® cleated SBR.

D Weight: 135.0 +/- 5%

E Mat Installation

1 Install using a full spread solvent free releasable or permanent adhesive.

2 Matting is to be cut “net” to the carpet material.

3 Quarter inch silicone bead is to be applied to the carpet edge where mat meets carpet.

4 Snap down reducer / transition strip is to be installed where matting material meets the threshold (door entryway).

F Matting applications: Where carpet material meets exterior doorways.

1 Exterior single door entryway will have a 4.5’ x 4.5’ mat area.

2 Exterior double door entryway will have a 7.5’ x 9’ mat area.

3 Exterior double door corridor entryway will have a 7.5’ x 18’ mat area.

3.5 PROTECTION

A Protect the Work of this section until Substantial Completion. Prohibit traffic on carpet for at least 12 hours after installation. Cover carpet with heavy non-staining kraft paper in areas when the work of other trades is to be performed and/or traffic and passage areas. Protect carpet from damage or soiling. Maintain in place until substantial completion.

3.6 CLEANING

A As each carpeted area is completed, clean up all dirt and debris, remove spots and soiling with proper cleaner, trim off loose threads with sharp scissors, and vacuum entire area clean.

3.7 CLEAN-UP

A Remove rubbish, debris, and waste materials and legally dispose of off the Project site.

3.8 INSTRUCTION

A Before Substantial Completion of the Work, provide a 4 hour Owner instruction period for proper maintenance of carpeting. Instructions shall be provided by technical representative of manufacturer.

END OF SECTION

SECTION 09 90 00- PAINTING

PART 1- GENERAL

1.1 SUMMARY

A Related Documents: Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specifications, apply to this section.

B This section includes surface preparation and field painting of the following:

1 Exposed interior items and surfaces.

2 Surface preparation, priming, and finish coats specified in this Section are in addition to shop priming and surface treatment specified in other Sections.

C Paint exposed surfaces except where a surface or material is specifically indicated not to be painted or is to remain natural. Where an item or a surface is not specifically mentioned, paint the item, or surface the same as similar adjacent materials or surfaces. If the schedules do not indicate color or finish, the Architect will select from standard colors and finishes available.

1 The Work includes field painting of existing and new exposed conduit, pipes, ducts, hangers, exposed steel and iron work, and exposed primed metal surfaces.

D Do not paint prefinished items, concealed surfaces, finished metal surfaces, operating parts, and labels unless specifically indicated otherwise in the drawings.

1 Labels: Do not paint over Underwriters Laboratories (UL), Factory Mutual (FM), or other code-required labels or equipment name, identification, performance rating, or nomenclature plates.

2 Toilet enclosures.

3 Finished mechanical and electrical equipment.

4 Light fixtures.

1.2 SUBMITTALS

A For each paint system specified, provide the following:

1 Material List: Provide an inclusive list of required coating materials. Indicate each material and cross-reference specific coating, finish system, and application. Identify each material by manufacturer's catalog number and general classification.

2 Manufacturer's Information: Provide manufacturer's technical information, including label analysis and instructions for handling, storing, and applying each coating material proposed for use.

B Samples for Verification: Prior to beginning work, Architect will furnish color selection information from manufacturer selected for surfaces to be painted. Submit samples for Architect's review of color and texture only.

1 Provide three stepped paint-out samples of each color, defining each separate coat, including primers. Samples to be 8 ½ X 11 minimum.

2 Provide a list of materials and applications for each coat of each sample. Label each sample for location and application.

1.3 QUALITY ASSURANCE

A Source Limitations: Obtain primers, and undercoat materials for each coating system from the same manufacturer as the finish coats.

B Codes and Standards: Conform work and materials to regulations of State Fire Marshal, Safety Color Coding in conformance with OSHA, and all local or State Ordinances, having jurisdiction. Conform to the most stringent requirements and authorities having jurisdiction.

1 Conform to the requirements of the California Air Resources Board (CARB).

C WORKMANSHIP

1 All work will be performed by experienced skillful craftsmen to assure finished work of first class quality and durability.

2 All paints and coatings shall be mixed and applied strictly in accordance with the manufacturer's printed instructions.

3 All materials shall be applied evenly with proper film thickness and free of runs, sags, skips and other defects. Enamel shall be sanded lightly between coats, dusted, and cleaned before recoating.

4 All work shall be done under favorable weather conditions, or the work shall be suitably protected from the weather.

5 Contractor must take responsibility for surface preparation and material application.

1.4 DELIVERY, STORAGE AND HANDLING

A Deliver materials to the job site in new, original, and unopened containers.

B Include on label of containers.

1 Manufacturer's name.

2 Type of paint.

3 Manufacturer's stock number.

4 Manufacturer's color name and number.

5 Application instructions.

6 Instructions for thinning or reducing, where applicable.

C Storage of materials:

1 Store only acceptable project materials on site.

2 Store in suitable location.

3 Restrict storage to paint materials and related equipment.

4 Comply with health and fire regulations.

D Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45 deg F (7 deg C). Maintain containers in clean condition, free of foreign materials and residue. Protect from freezing. Keep storage area neat and orderly. Remove oily rags and waste daily.

1.5 CONDITIONS

A Environmental Requirements:

1 Comply with manufacturer's recommendations as to environmental conditions under which coatings and coating systems can be stored and applied.

2 Do not paint when there is a threat of rain within 48 hours or when surface or air temperatures are at or below 50 degrees.

3 Comply with current applicable local, state, and federal regulations and requirements.

1.6 EXTRA MATERIALS

A Furnish extra paint materials from the same production run as the materials applied in the quantities described below. Package paint materials in unopened, factory-sealed containers for storage and identify with labels describing contents. Deliver extra materials to the District.

B One five-gallon container, each color, each sheen.

PART 2- PRODUCTS

2.1 PRODUCT DESCRIPTION: This section of specifications makes reference to product names, model numbers, components of systems descriptions identified with a specific manufacturer. Such reference is made solely to identify a standard of quality.

A Available Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated into the work include but are not limited to the following:

1 Dunn Edwards Paint Co.

2 Approved Equal

B Material Compatibility: Provide primers, undercoats, and finish-coat materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.

C Material Quality: Provide manufacturer's best-quality paint material of the various coating types specified. Material containers not displaying manufacturer's product identification will not be acceptable.

1 Proprietary Names: Use of manufacturer's proprietary product names to designate colors or materials is not intended to imply that products named are required to be used to the exclusion of equivalent products of other manufacturers.

D Contractor shall anticipate the following variety of colors throughout the project:

1 Exterior Wall Colors: 2 colors

2 Exterior Trim and Accent Colors: 4 colors

3 Interior Wall Colors: 2 colors

4 Interior Trim and Accent Colors: 4 colors E

Deliver paints ready mixed to job site.

F All paints and coatings shall be mixed and applied strictly in accordance with the manufacturer's printed instructions.

G Use tinting colors recommended by manufacturer for specific type of finish.

PART 3- EXECUTION

3.1 EXAMINATION

A Examine substrates, areas, and conditions under which painting will be performed for compliance with application requirements. Do not begin to apply paint until unsatisfactory conditions have been corrected and surfaces receiving paint are thoroughly dry. No painting shall be done on painted surfaces until the District Inspector approves surfaces.

B Review other Sections in which primers are provided to ensure compatibility of the total system for various substrates.

3.2 PREPARATION

A General Procedures: Paint prior to installation of all hardware and accessories, or remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and similar items

already installed that are not to be painted. If removal is impractical or impossible because of the size or weight of the item, provide surface-applied protection before surface preparation and painting. After completing painting operations in each space or area, reinstall items removed using workers skilled in the trades involved.

B Cleaning: Before applying paint or other surface treatments, clean the substrates of substances that could impair the bond of the various coatings. Remove oil and grease before cleaning. Clean floors in rooms being painted of all loose dirt and dust. Schedule cleaning and finishing so dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces.

C Surface Preparation: Clean and prepare surfaces to be painted according to manufacturer's written instructions for each particular substrate condition.

1 Cementitious Materials: Remove efflorescence, chalk, dust, dirt, grease, oils, and release agents. Roughen as required to remove glaze. If hardeners or sealers have been used to improve curing, use mechanical methods of surface preparation. Use abrasive blast-cleaning methods if recommended by paint manufacturer.

a Determine alkalinity and moisture content of surfaces by performing appropriate tests. If surfaces are sufficiently alkaline to cause the finish paint to blister and burn, correct this condition. Do not paint surfaces where moisture content exceeds that permitted in manufacturer's written instructions.

b Clean existing exterior unpainted masonry wall surfaces with muriatic solution. Do not paint exterior unpainted masonry wall surfaces.

2 Wood: Clean surfaces of dirt, oil, and other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sand surfaces exposed to view smooth and dust off.

a Scrape and clean small, dry, seasoned knots, and apply a thin coat of recommended knot sealer before applying primer. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood filler to match natural wood finish. Sand smooth when dried.

b Prime or seal wood to be painted immediately on delivery. Prime edges, ends, faces, undersides, and backsides of wood.

c Seal tops, bottoms, and cutouts of unprimed wood doors with a sealer immediately on delivery.

3 Ferrous Metals: Clean ungalvanized ferrous-metal surfaces that have not been shop coated; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent or mechanical cleaning methods that comply with the Steel Structures Painting Council's (SSPC) recommendations.

a Touch up bare areas and shop-applied prime coats that have been damaged. Wire-brush, clean with solvents recommended by paint manufacturer, and touch up with the same primer as the shop coat.

b Prime all bare metal with suitable metal primer.

4 Galvanized Surfaces: Clean galvanized surfaces with nonpetroleum-based solvents so surface is free of oil and surface contaminants. Remove pretreatment from galvanized sheet metal fabricated from coil stock by mechanical methods.

D Preparation of Existing Surfaces:

1 Wood, plaster and metal surfaces shall be washed with TSP (tri-sodium phosphate), to remove dirt, grease and other foreign materials and rinsed with clean water and then sandpapered and dusted off. Surfaces shall have wax completely removed before painting. Degloss all glossy and previously enameled surfaces to provide a roughened surface or "tooth" for good adhesion on subsequent coats.

2 Checked, cracked, blistered, loose and alligatored paint on wood and metal surfaces shall have the paint removed down to original finished surface, hand sanded and dusted clean.

3 All rust must be removed prior to coating metal surfaces.

4 Voids around doors, windows, fixtures, other permanent items shall be caulked with sealant compound specified in Section 07901. Spot prime patched and repaired areas with a primer-sealer as recommended by the paint manufacturer for the surfaces to be refinished.

5 Wood surfaces: Fill holes and blemished wood with wood patching compound and prime.

6 Existing Clear Finish Wood Casework to Remain: Clean and protect existing hardware to remain. Strip existing exposed casework surfaces to bare wood. Fill holes and blemished wood surfaces with wood patching compound. Sand exposed surfaces using at least 150 grit or finer sandpaper, and thoroughly clean all surfaces before applying stain, sealer, and finish.

7 Gypsum Board, Exterior and Interior Plaster Surfaces:

a Hairline Cracks: Skim cracks with Acrylic Urethane Elastomeric Sealant (DEC 920) or equal, and spot prime.

b Small to Large Cracks: A credit card thickness or greater (1/8") needs to be filled with an Acrylic Urethane Elastomeric Sealant (DEC 920) sealant (recommended by the Paint Manufacturer) prior to applying 2 coats of coating.

c Large Cracks: Cracks 1/4" to 1/2" need to be "vee'd out", the crack(s) to be 1/4" minimum wide, then filled with Acrylic Urethane Elastomeric Sealant (DEC 920) sealant prior to application of 2 coats of coating and spot prime.

d If existing plaster was a machine applied, apply final application of finish coat over patched areas by machine to match existing adjacent machine texture. Use a finish stucco material with a bonding admixture mixed according to manufacturer's recommendation

E Materials Preparation: Mix and prepare paint materials according to manufacturer's written instructions.

1 Stir material before application to produce a mixture of uniform density. Stir as required during application. Do not stir surface film into material. If necessary, remove surface film and strain material before using.

2 Use only thinners approved by paint manufacturer and only within recommended limits.

3.3 APPLICATION

A No painting shall be done until surfaces are approved by the District Inspector.

B Apply paint in accordance with manufacturer's directions. Use applicators and techniques best suited for substrate and type of material being applied.

C Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film.

D Provide finish coats that are compatible with primers used.

E Minimum Coating Thickness: Apply each material at not less than the manufacturer's recommended spreading rate, to provide a total dry film thickness of not less than 5.0 mils for the entire coating system of prime and finish coats for three coat work. Provide a total dry film thickness of not less than 3.5 mils for the entire coating system of prime and finish coat for two coat work.

F Apply additional coats when undercoats, stains, or other conditions show through final coat of paint until paint film is of uniform finish, color, and appearance. Give special attention to ensure that surfaces, including edges, corners, crevices, welds, and exposed fasteners, receive a dry film thickness equivalent to that of flat surfaces.

G The term "exposed surfaces" includes areas visible when permanent or built-in fixtures, convector covers, covers for finned tube radiation, grilles, and similar components are in place. Extend coatings in these areas as required to maintain the system integrity and provide desired protection.

H Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Paint surfaces behind permanently fixed equipment or furniture with prime coat only before final installation of equipment.

I Paint interior surfaces of ducts, where visible through registers or grilles, with a flat, non-specular black paint.

J Paint back sides of access panels and removable or hinged covers to match exposed surfaces.

K Back prime all exterior wood. Back prime interior wood that will be set against plaster, concrete or masonry surfaces.

L Wood Doors: Roll and redistribute paint to an even and fine texture. Leave no evidence of rolling such as laps, irregularity in texture, skid marks, or other surfaces imperfections. Finish tops,

bottoms, and edges of doors same as balance of door after door has been fitted by Carpenter. Where doors open into rooms or spaces having different finishes, communicating doors shall have edges finished as directed.

M Where walls are specified to be painted, include all columns, arises, reveals, soffits, returns, etc.

N Priming: Where shop coats and touch-up painting are specified under other sections of the work, omit prime coat. Prime all un-galvanized ferrous metals. Prime all doors requiring paint, as soon as possible after delivery to job. Prime all edges create by louver and glazing cut-outs.

3.4 CLEANING

A Cleanup: At the end of each workday, remove empty cans, rags, rubbish, and other discarded materials from the site.

1 After completing work, clean glass and paint-spattered surfaces. Remove spattered stain and paint by washing and scraping. Be careful not to damage adjacent finished surfaces.

3.5 PROTECTION

A Protect work of other trades, whether being finished or not, against damage by staining or painting. Correct damage by cleaning, repairing, or replacing, and finishing as approved by Architect.

B Provide "Wet Paint" signs to protect newly painted finishes. Remove temporary protective wrappings provided by others to protect their work after completing painting operations. At completion of construction activities of other trades, touch up and restore damaged or defaced stained or painted surfaces. Comply with procedures specified in PDCA P1.

3.6 PAINT SCHEDULE

Interior:

Wood – Painted, Opaque Finish: (doors, painted trim)

First coat: INTER-KOTE® Premium (IKPR00) Int. 100% Acrylic Under coater

Second coat: EVERSHIELD 100% Acrylic (EVSH50-0) Semi-Gloss

Third coat: EVERSHIELD 100% Acrylic (EVSH50-0) Semi-Gloss

Plaster/Drywall:

First coat: VINYLASTIC VNPR00-0-WH-1

Second coat: EVERSHIELD100%Acrylic (EVSH50-0) Semi-Gloss

Third coat: EVERSHIELD 100% Acrylic EVSH 50-0) Semi-Gloss

Concrete Block:

First coat: EFF-STOP SELECT SEALER (ESSL00 50-0)

Second coat: EVERSHIELD 100% Acrylic (EVSH 50-0) Semi-Gloss

Third coat: EVERSHIELD 100% Acrylic (EVSH 50-0) Semi-Gloss

Ferrous Metal:

First coat: BLOC-RUST PREMIUM BRPR00-0

Second coat: EVERSHIELD 100% Acrylic (EVSH50-0) Semi-Gloss

Third coat: EVERSHIELD 100% Acrylic (EVSH50-0) Semi-Gloss

Nonferrous Metal: Including but not limited to exposed ductwork and exposed conduit.

Pretreatment: SUPREME CHEMICAL SCME-01

First Coat: GALV-ALUM™ PREMIUM (GAPR00)

Second coat: EVERSHIELD 100% Acrylic (EVSH50-0) Semi-Gloss

Third coat: EVERSHIELD 100% Acrylic (EVSH50-0) Semi-Gloss

* Omit on shop primed products

Exterior:

Plaster:

First coat: EFF-STOP Select (ESSL00)

Second coat: EVERSHIELD100% Acrylic (EVSH50-0) Semi-Gloss

Third coat: EVERSHIELD 100% Acrylic EVSH 50-0) Semi-Gloss

Concrete Block:

RAINGUARD INTERNATIONAL

VANDLSYSTEM PRODUCTS: NON-SACRIFICIAL ANTI-GRAFFITI COATING

First coat: MICRO-SEAL WATER REPELLENT Clear

Second coat: VANDLGUARD VG-7000 Clear

Third coat: VANDLGUARD VG-7000 Clear

Fourth Coat: VANDLGUARD VG-7000 Clear

Ferrous Metal:

First Coat: BLOC-RUST PREMIUM BRPR00-0

Second coat: EVERSHIELD 100% Acrylic (EVSH50-0) Semi-Gloss

Third coat: EVERSHIELD 100% Acrylic (EVSH50-0) Semi-Gloss

Galvanized Metal, Aluminum:

Pretreatment: SUPREME CHEMICAL SCME-01

First coat*: GALV-ALUM™ Premium (GAPR00)

Second coat: EVERSHIELD100% Acrylic (EVSH50- 0) Semi-Gloss

Third coat: EVERSHIELD 100% Acrylic (EVSH50-0) Semi-Gloss

* omit on shop primed products

Wood, Painted: (Doors, Fascia, Trim, etc.)

First Coat: E-Z PRIME,EZPRO-0-WH-1

Second coat: EVERSHIELD 100% Acrylic (EVSH50-0) Semi-Gloss

Third coat: EVERSHIELD 100% Acrylic (EVSH50-0) Semi-Gloss

END OF SECTION

SECTION 09 68 16 – SHEET CARPETING

PART 1- GENERAL

1.1 SUMMARY

A This Section includes Carpeting / VCTT (Vinyl Cushion Tufted Textile), installation, and accessories.

1.2 RELATED SECTIONS

A The following sections contain requirements that relate to this Section:

1 Section 09650 - Resilient Flooring - Resilient Wall Base

1.3 SUBMITTALS:

A Product data for each type of carpet material and installation accessory required. Submit written data on physical characteristics, durability, resistance to fading, and flame resistance characteristics.

B Shop drawings showing layout and seaming diagrams. Indicate pile or pattern direction and locations and types of edge strips. Indicate columns, doorways, enclosing walls or partitions, built-in cabinets, and locations where cutouts are required in carpet. Show installation details at special conditions.

C Samples for verification purposes in manufacturer's standard size, showing full range of color, texture, and pattern variations expected. Prepare samples from same material to be used for the Work. Submit the following:

1 12-inch-square samples of each type of carpet material required.

2 12-inch-long samples of each type exposed edge stripping and accessory item.

D Certificate:

1 Submit a certificate from carpet manufacturer that materials supplied comply with fire hazard resistance standards specified.

2 Submit a manufacturer certification that the Installer(s) is approved by the manufacture to install the specified product.

E Installer’s/Subcontractor’s Experience Qualifications: Submit list of not less than 5 projects with similar scope of work, extending over period of not less than 5 years, indicating installer’s experience record.

F Calcium chloride test results.

1.4 QUALITY ASSURANCE

A Comply with the following as a minimum requirement:

1 Carpet shall be securely attached and shall have a firm cushion, pad, or backing or no cushion or pad. It shall have a level loop, textured loop, level cut pile, or level cut/uncut pile texture. Pile height shall be ½" maximum. CBC Section 11B-302.2

2 Exposed Edges shall be fastened to floor surfaces and shall have trim on the entire length. Carpet edges shall comply with CBC Section 11B-303. CBC Section 11B-302.2

3 Manufacturer's installation instructions.

B Requirements of Regulatory Agencies: Carpeting shall meet requirements of federal, state and local regulatory agencies for flammability, static control, or other properties as specified, with testing documentation from the manufacturer by a third party laboratory.

C Carpet Installation: Comply with CRI 104 - Standard for Installation of Textile Floor Covering Materials.

D Each color of carpet shall be of the same dye lot.

E Pre-Installation and Progress meetings: Prior to start of work of this section and after approval of submittals, schedule an on site Pre-Installation between Contractor, Supervising Installer, OAR and IOR to review construction drawings and installation procedures in accordance with the requirements of this specification.

1.5 DELIVERY, STORAGE AND HANDLING

A Full or cut rolls of carpeting shall be cut, packaged and identified by the factory. Distributor, dealer, or vendor cutting, re-packaging, and re-labeling is not permitted.

B Store material at least 24 hours at room temperature prior to installation and in accordance to all manufacturer's instructions.

C Deliver fire-rated materials with testing agency labels and required fire classification numbers attached and legible.

1.6 JOB CONDITIONS

A Ventilation and Temperature: Verify areas to be carpeted are ventilated to remove fumes from installation materials, and areas are within temperature range recommended by the various material manufacturers for Project site installation conditions. The temperature of a concrete slab must be stabilized above 65 degrees both 12 hours prior to and after the installation. The following environmental conditions inside the building are critical for proper installation. Temperature must be between 65 degrees F and 95 degrees F and the humidity between 10% and 65% for at least 72 hours before and 72 hours after installation. In addition, any adhesives, edge sealers and seam sealers should be stored under these conditions for a minimum of 24 hours prior to installation.

B Protection: Prohibit traffic on carpet for at least 12 hours after installation. Cover carpet with heavy non-staining kraft paper in areas where the Work of other trades is to be performed and/or traffic and passage areas. Protect carpet from damage or soiling. Maintain protection in place until Substantial Completion.

C Substrate Conditions: Moisture vapor emission of 5 lb. per 1000 square feet or less. pH of 9 or less.

1.7 EXTRA MATERIALS

A Deliver extra materials to Owner. Furnish extra materials matching products installed as described below, packaged with protective covering for storage and identified with labels describing contents.

1 Carpet: Before installation begins, furnish quantity of full width for each type of material equal to 5 percent of amount installed.

1.8 WARRANTY

A Provide manufacturers standard, printed 25 year non pro-rated warranty against the following defects for the stated period after acceptance of installation:

1 Edge Ravel: No edge ravel based on normal use, wet and dry condition of use, and without use of seam sealers for lifetime of material.

2 Secondary Back Adhesion: The cushion and backing system will have no delamination based on normal use for the life of the installation.

3 Tuft Bind: No edge raveling, yarn zippering or yarn pulls as determined by the non-prorated warranty.

4 Excessive Static Electricity, defined as exceeding 3.0 Kilovolts at 20% RH and 70 degrees F per AATCC 134 for lifetime of material.

5 Manufacturers published warranty for stain release.

6 Manufacturers published warranty for colorfastness.

B Use of chair pads shall not be a pre-condition for warranty coverage

C Carpeting exhibiting defects as defined shall be replaced or repaired by the manufacturer. Secondary warranties involving those other than the manufacturer are not acceptable.

1.9 CONTRACTOR GUARANTY

A Provide guaranty, in Owner's Representative approved form, against the following defects for a period of 5 years after acceptance of installation:

1 Doming, wrinkling or delamination from substrate.

2 Separation, lifting, puckering or other seam defects.

3 Loose yarn tufts, strays or other yarn pieces at seams or edges.

PART 2- PRODUCTS

2.1 MANUFACTURERS

A Basis of Design: Characteristics of specific products manufactured by Collins & Aikman Floorcoverings Inc DBA Tandus are indicated to establish required level of quality, appearance, and performance. The Owner's Representative may consider comparable products by alternate manufacturers listed in this Section, and requests for substitutions, under the provisions of the General Conditions and Division 1 Specification Sections.

2.2 CARPET

A Type: VCTT / Vinyl Cushion Tufted Textile. The wear layer will be Anton type 6.6. The backing will be vinyl cushion with a pre-applied adhesive to 100% of the backing.

B Series: Powerbond.

1 Style:

a C&A "Aragon", Blue Shadow: 6' Powerbond cushion RS

C Construction:

1 Minimum gauge/stitch count: 1/12 inch / 9.5 stitches per inch.

2 Wear layer minimum weight: 18 oz face weight

3 Product density: factor 10,588

4 Pile Height: 0.117 inch average

5 Wear Layer: DuPont Type 6.6, Antron Legacy and Lumina BCF Nylon with Ensure soil resistant treatment.

a Alternate yarn manufacturers are not acceptable.

D Backing:

1 Primary: synthetic / non-woven.

2 Secondary: vinyl cushion Powerbond with pre-applied adhesive to 100% of the backing at the time of manufacturing.

E Fire/Habitability Criteria

1 Critical Radiant Flux: Minimum 0.45 w/sq cm per ASTM E 648, (Class 1 per UFC Appendix IV).

2 Smoke Density: 450 or less, per ASTM E 662.

3 Static Propensity: 3.0 KV or less per AATCC 134.

4 Air quality:

a Comply with State of California criteria for indoor air criteria, including VOC and particle emissions or approved equivalent test standard.

b No detectable levels of formaldehyde or 4-PC.

2.3 ACCESSORIES

A Adhesives: None, the carpet manufacturer is to apply adhesive to 100% of the backing (RS dry adhesive system).

B Primers (where required): Water based, of types recommended by carpet manufacturer, free of 4-PC. Solvent based products not permitted.

C Seam sealer: Type as recommended by carpet manufacturer.

D Transition Strip: Johnsonite, vinyl type, #CTA-xx-A, color as selected.

2.4 OTHER MATERIALS

A Provide all other materials, not specifically described but required for complete and proper installation of this work, as selected by the contractor and subject to the approval of the Owner's Representative.

PART 3- EXECUTION

3.1 EXAMINATION

A Before installation is started, examine surfaces to receive carpet. Deficiencies shall be corrected before starting Work of this section.

B Field verify dimensions and other conditions affecting this Work before commencing carpet installation.

3.2 PREPARATION

A Moisture testing

1 Conduct anhydrous calcium chloride testing using prepackaged kit systems approved by flooring manufacturer.

2 Provide test at coverage rate required by flooring manufacturer, with minimum of 3 tests/first 1,000 square feet and 1 test per each 1,000 square feet after. Distribute uniformly throughout building. Prepare map or diagram of test locations in each building.

3 Conduct one set of tests 60 days prior to scheduled flooring installation. Submit test results to Owner's Representative within 48 hours of test receipt.

4 Conduct second set of tests 14 days prior to scheduled flooring installation. Submit test results to Owner's Representative within 48 hours of test receipt.

5 Submit testing to Owner's Representative prior to beginning slab preparation or flooring work.

6 Evaluate floor surface. Prepare surface and apply filler to all floor surfaces exhibiting the following characteristics:

1 Cracks, gouges or holes exceeding 1/16 inch in any dimension.

2 Cracks with adjacent surfaces exceeding 1/16 inch in height.

3 All expansion weakened plane or construction joints.

4 All surfaces exhibiting rough or abraded texture exceeding 1/16 inch amplitude.

5 All surfaces with gap exceeding 3/16 inch under 10-foot metal straight edge.

B Filler Installation:

1 Prepare existing concrete substrate as recommended by filler manufacturer, including mechanical shot-blasting or equivalent.

2 Acid etching is not acceptable.

3 Prepare existing cracks in substrate as recommended by manufacturer.

4 Apply filler and trowel to leave a smooth, flat, hard surface.

5 Prohibit traffic from area until filler is cured. Vacuum clean substrate.

C Floor Preparation:

1 Remove all outlet floor plates and utility covers, doorstops, and similar components. Label and store for re-installation.

2 Remove all curing compounds, waxes, grease, paint and other coatings. Vacuum substrate clean. Damp mop to remove dust that may remain after first vacuuming, allow surface to dry, and again vacuum; repeat procedure if necessary to eliminate all dust. Do not furnish oiled or chemical treated sawdust or any similar product for dust removal.

3 Apply primers as recommended by carpet manufacturer.

3.3 INSTALLATION

A General: Install carpet in accordance with requirements of CRI 104, except where more stringent requirements are specified herein or recommended by carpet materials manufacturers.

B Install carpet rolls in each dye lot in the number sequence as furnished by manufacturer. Roll out carpet in one direction and do not reverse direction at any locations. Align carpet with centerline of room or space, and adjust at edges for wall variations.

C Color Control: Install dye lot in the number sequence at locations indicated to prevent shading variations. Install only one dye lot for each area of building unless otherwise reviewed. If more than one dye lot is required, obtain prior review of color match between dye lots and, Owner’s written approval.

D Carpet Runs: Install carpet in one-piece lengths between permanent walls unless otherwise required. Seams are permitted only where shown on the layout Shop Drawings. Install corridor carpet in one-piece sizes for full length and width, cross seaming only where corridors change direction.

E Laying and Seaming: Cut carpet for seams between tuft rows and prevent damage to tufts or loops, prevent edge ravels, and preserve uniform tuft row alignment and spacing on both sides and across seams. Install carpet with tuft or loop rows in straight lines both ways, free of offsets, waviness, distortion, or misalignment. Cut seam edges straight and square with backing. Trim carpet at walls, columns, and penetrations for a compressed fit.

F Doorways: Extend carpet (Permanent Mats) into doorways without piecing in and seam to the carpet on other side of door under door centerline except where metal thresholds occur; no small filler pieces of carpet will be permitted at doorways.

3.4 PERMANENT MATS

A Material Geometric Tile Triad Mat Series (Collins & Aikman Floorcoverings Inc DBA Tandus)

B Size 18” x 18”

C Backing: Special non-thermoplastic tri-grip® cleated SBR.

D Weight: 135.0 +/- 5%

E Mat Installation

1 Install using a full spread solvent free releasable or permanent adhesive.

2 Matting is to be cut “net” to the carpet material.

3 Quarter inch silicone bead is to be applied to the carpet edge where mat meets carpet.

4 Snap down reducer / transition strip is to be installed where matting material meets the threshold (door entryway).

F Matting applications: Where carpet material meets exterior doorways.

1 Exterior single door entryway will have a 4.5’ x 4.5’ mat area.

2 Exterior double door entryway will have a 7.5’ x 9’ mat area.

3 Exterior double door corridor entryway will have a 7.5’ x 18’ mat area.

3.5 PROTECTION

A Protect the Work of this section until Substantial Completion. Prohibit traffic on carpet for at least 12 hours after installation. Cover carpet with heavy non-staining kraft paper in areas when the work of other trades is to be performed and/or traffic and passage areas. Protect carpet from damage or soiling. Maintain in place until substantial completion.

3.6 CLEANING

A As each carpeted area is completed, clean up all dirt and debris, remove spots and soiling with proper cleaner, trim off loose threads with sharp scissors, and vacuum entire area clean.

3.7 CLEAN-UP

A Remove rubbish, debris, and waste materials and legally dispose of off the Project site.

3.8 INSTRUCTION

A Before Substantial Completion of the Work, provide a 4 hour Owner instruction period for proper maintenance of carpeting. Instructions shall be provided by technical representative of manufacturer.

END OF SECTION

SECTION 10 44 00 - SIGNAGE

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following types of signs:

B. SECTION INCLUDES

1. Permanent room or space identification signage.
2. Site directional and informational signage.
3. Site vehicle control signage.
4. Safety signage.

C. Related Sections: The following Sections contain requirements that relate to this Section:

1. Section 09 26 13 - Gypsum Veneer Plastering

D. SUBMITTALS

1. General: Submit the following according to the Conditions of the Contract and Division 1 Specification Sections.
2. Product data for each type of sign specified, including details of construction relative to materials, dimensions of individual components, profiles, and finishes.
3. Shop drawings showing fabrication and erection of signs. Include plans, elevations, and large-scale sections of typical members and other components. Show anchors, grounds, layout, reinforcement, accessories, and installation details.
    a. Provide message list for each sign required, including large-scale details of wording and lettering layout.
    b. For signs supported by or anchored to permanent construction, provide setting drawings, templates, and directions for installation of anchor bolts and other anchors to be installed as a unit of Work in other Sections.
    c. Templates: Furnish full-size spacing templates for individually mounted dimensional letters and numbers.
4. Samples: Submit samples of each sign form and material showing finishes, colors, surface textures and qualities of manufacturer and design of each sign component including graphics.
    a. Submit full-size sample units. Acceptable units may be installed as part of the work.

E. QUALITY ASSURANCE

1. Sign Fabricator Qualifications: Firm experienced in producing signs similar to those indicated for this Project, with a record of successful in-service performance, and sufficient production capacity to produce sign units required without causing delay in the Work.

2. Single-Source Responsibility: For each separate sign type required, obtain signs from one source of a single manufacturer.

3. Design Criteria: The drawings indicate size, profiles, and dimensional requirements of some signs and some are based on the specific type and model indicated. Signs by other manufacturers may be considered provided that deviations in dimensions and profiles are minor and do not change the design concept as judged by the Architect. The burden of proof of equality is on the Contractor.

   a. All signage shall conform to CBC Section 11B-703.

   b. All door mounted toilet room signage shall conform to CBC Sections 11B-216.8 and 11B-703.7.2.6.

   c. Exit signage shall be provided per CBC Section 1013.1.

   d. Tactile exit signage shall be provided per CBC Section 1013.4.

   e. Raised Characters: Raised characters shall comply with CBC Section 11B-703.2 and shall be duplicated in Braille complying with CBC Section 11B-703.3. Raised characters shall be installed in accordance with CBC Section 11B-703.4.

   f. Depth: Raised characters shall be 1/32 inch (0.8 mm) minimum above their background per CBC Section 11B-703.2.1.

   g. Case: Characters shall be uppercase per CBC Section 11B-703.2.2.

   h. Style: Characters shall be sans serif. Characters shall not be italic, oblique, script, highly decorative, or of other unusual forms per CBC Section 11B-703.2.3.

   i. Character Proportions: Characters shall be selected from fonts where the width of the uppercase letter "O" is 60 percent minimum and 110 percent maximum of the height of the uppercase letter "I" per CBC Section 11B-703.2.4.

   j. Character Height: Character height measured vertically from the baseline of the character shall be 5/8 inch (15.9 mm) minimum and 2 inches (51 mm) maximum based on the height of the uppercase "I" per CBC Section 11B-703.2.5.

   k. Stroke Thickness: Stroke thickness of the uppercase letter "I" shall be 15 percent maximum of the height of the character per CBC Section 11B-703.2.6.

   l. Character Spacing: Character spacing shall be measured between the two closest points of adjacent raised characters within a message, excluding word spaces. Where characters have rectangular cross sections, spacing between individual raised characters shall be 1/8 inch (3.2 mm) minimum and 4 times the raised character stroke width maximum. Where characters have other cross sections, spacing between individual raised characters shall be 1/16 inch (1.6 mm) minimum and 4 times the raised character stroke width maximum at the base of the cross sections and 1/8 inch (3.2 mm) minimum and 4 times the raised character stroke width maximum at the top of the cross sections. Characters shall be separated from raised

borders and decorative elements 3/8 inch (9.5 mm) minimum per CBC Section 11B-703.2.7.

4. Line Spacing: Spacing between the baselines of separate lines of raised characters within a message shall be 135 percent minimum and 170 percent maximum of the raised character height per CBC Section 11B-703.2.8.

5. Format: Text shall be in a horizontal format per CBC Section 11B-703.2.9.

6. Finish and Contrast: Characters and their background shall have a non-glare finish. Characters shall contrast with their background with either light characters on a dark background or dark characters on a light background per CBC Section 11B-703.5.1.

F. Braille: Braille shall be contracted (Grade 2) and shall comply with CBC Section 11B-703.3. Braille shall be installed in accordance with CBC Section 11B-703.4.

1. Dimensions and Capitalization: Braille dots shall have a domed or rounded shape and shall comply with CBC Table 11B-703.3.1 and CBC Figure 11B-703.3.1. The indication of an uppercase letter or letters shall only be used before the first word of sentences, proper nouns and names, individual letters of the alphabet, initials, and acronyms per CBC Section 11B-703.3.1.

   a. Dot Base Diameter: 0.059 inch minimum to 0.063 inch maximum per CBC Table 11B-703.3.1.

   b. Distance Between Two Dots in the Same Cell: 0.100 inch measured center to center per CBC Table 11B-703.3.1.

   c. Distance Between Corresponding Dots in Adjacent Cells: 0.300 inch measured center to center per CBC Table 11B-703.3.1.

   d. Dot Height: 0.025 inch minimum to 0.037 inch maximum per CBC Table 11B-703.3.1.

   e. Distance Between Corresponding Dots From One Cell Directly Below: 0.395 inch minimum to 0.400 inch maximum measured center to center per CBC Table 11B-703.3.1.

2. Position: Braille shall be positioned below the corresponding text in a horizontal format, flush left or centered. If text is multi-lined, Braille shall be placed below the entire text. Braille shall be separated 3/8 inch minimum and 1/2 inch maximum from any other tactile characters and 3/8 inch minimum from raised borders and decorative elements per CBC Section 11B-703.3.2.

G. Installation Height and Location: Signs with tactile characters shall comply with CBC Section 11B-703.4.

1. Height Above Finish Floor or Ground: Tactile characters on signs shall be located 48 inches minimum above the finish floor or ground surface, measured from the baseline of the lowest Braille cells, and 60 inches maximum above the finish floor or ground surface, measured from the baseline of the highest line of raised characters per CBC Section 11B-703.4.1.

2. Location: Where a tactile sign is provided at a door, the sign shall be located alongside the door at the latch side. Where a tactile sign is provided at double doors with one active leaf, the sign shall be located on the inactive leaf. Where a tactile sign is provided at double doors with two active leaves, the sign shall be located to the right of the right hand door. Where

there is no wall space at the latch side of a single door or at the right side of double doors, signs shall be located on the nearest adjacent wall. Signs containing tactile characters shall be located so that a clear floor space of 18 inches minimum by 18 inches minimum, centered on the tactile characters, is provide beyond the arc of any door swing between the closed position and 45 degree open position. Where permanent identification signage is provided for rooms and spaces they shall be located on the approach side of the door as one enters the room or space. Signs that identify exits shall be located on the approach side of the door as one exits the room or space per CBC Section 11B-703.4.2 and CBC Figure 11B-703.4.2.

H. Visual Characters: Visual characters shall comply with CBC Section 11B-703.5.

1. Where visual characters comply with CBC Section 11B-703.2 and are accompanied by Braille complying with CBC Section 11B-703.3, they shall not be required to comply with CBC Sections 11B-703.5.2 through 11B-703.5.6, 11B-703.5.8, and 11B-703.5.9.

2. Finish and Contrast: Characters and their background shall have a non-glare finish. Characters shall contrast with their background with either light characters on a dark background or dark characters on a light background per CBC Section 11B-703.5.1.

3. Case: Characters shall be uppercase or lowercase or a combination of both per CBC Section 11B-703.5.2.

4. Style: Characters shall be conventional in form. Characters shall not be italic, oblique, script, highly decorative, or of other unusual forms per CBC Section 11B-703.5.3.

5. Character Proportions: Characters shall be selected from fonts where the width of the uppercase letter "O" is 60 percent minimum and 110 percent maximum of the height of the uppercase letter "I" per CBC Section 11B-703.5.4.

6. Character Height: Minimum character height shall comply with CBC Table 11B-703.5.5. Viewing distance shall be measured as the horizontal distance between the character and an obstruction preventing further approach towards the sign. Character height shall be based on the height of the uppercase "I" per CBC Section 11B-703.5.5.

7. Height From Finish Floor or Ground: Visual characters shall be 40 inches minimum above the finish floor or ground per CBC Section 11B-703.5.6.

8. Stroke Thickness: Stroke thickness of the uppercase letter "I" shall be 10 percent minimum and 20 percent maximum of the height of the character per CBC Section 11B-703.5.7.

9. Character Spacing: Character spacing shall be measured between the two closest points of adjacent characters, excluding word spaces. Spacing between individual characters shall be 10 percent minimum and 35 percent maximum of the character height per CBC Section 11B-703.5.8.

10. Line Spacing: Spacing between the baselines of separate lines of characters within a message shall be 135 percent minimum and 170 percent maximum of the character height per CBC Section 11B-703.5.9.

11. Format: Text shall be in a horizontal format per CBC Section 11B-703.5.10.

I. Pictograms: Pictograms shall comply with CBC Section 11B-703.6.

1. Pictogram Field: Pictograms shall have field height of 6 inches minimum. Characters and Braille shall not be located in the pictogram field per CBC Section 11B-703.6.1.

2. Finish and Contrast: Pictograms and their field shall have a non-glare finish. Pictograms shall contrast with their field with either a light pictogram on a dark field or a dark pictogram on a light field per CBC Section 11B-703.6.2.

3. Text Descriptors: Pictograms shall have text descriptors located directly below the pictogram field. Text descriptors shall comply with CBC Sections 11B-703.2, 11B-703.3, and 11B-703.4 per CBC Section 11B-703.6.3.

J. Symbols of Accessibility: Symbols of accessibility shall comply with CBC Section 11B-703.7.

1. Finish and Contrast: Symbols of accessibility and their background shall have a non-glare finish. Symbols of accessibility shall contrast with their background with either a light symbol on a dark background or a dark symbol on a light background per CBC Section 11B-703.7.1.

2. International Symbol of Accessibility: The International Symbol of Accessibility shall comply with CBC Figure 11B-703.7.2.1. The symbol shall consist of a white figure on a blue background. The blue shall be Color No. 15090 in Federal Standard 595C per CBC Section 11B-703.7.2.1.

    a. The appropriate enforcement agency may approve other colors to compliment décor or unique design. The symbol contrast shall be light on dark or dark on light.

3. Assistive Listening Systems: Assistive listening systems shall be identified by the International Symbol of Access for Hearing Loss complying with CBC Figure 11B-703.7.2.4 per CBC Section 11B-703.7.2.4.

K. Toilet and Bathing Facilities Geometric Symbols: Doorways leading to toilet rooms and bathing rooms shall be identified by a geometric symbol complying with CBC Section 11B-703.7.2.6. The symbol shall be mounted at 58 inches minimum and 60 inches maximum above the finish floor or ground surface measured from the centerline of the symbol. Where a door is provided the symbol shall be mounted within 1 inch of the vertical centerline of the door per CBC Section 11B-703.7.2.6.

1. Men's Toilet and Bathing Facilities: Men's toilet and bathing facilities shall be identified by an equilateral triangle, 1/4 inch thick with edges 12 inches long and a vertex pointing upward. The triangle symbol shall contrast with the door, either light on a dark background or dark on a light background per CBC Section 11B-703.7.2.6.1.

2. Women's Toilet and Bathing Facilities: Women's toilet and bathing facilities shall be identified by a circle, 1/4 inch thick and 12 inches in diameter. The circle symbol shall contrast with the door, either light on a dark background or dark on a light background per CBC Section 11B-703.7.2.6.2.

3. Unisex Toilet and Bathing Facilities: Unisex toilet and bathing facilities shall be identified by a circle, 1/4 inch thick and 12 inches in diameter with a 1/4 inch thick equilateral triangle with a vertex pointing upward superimposed on the circle and within the 12 inch diameter. The triangle symbol shall contrast with the circle symbol, either light on a dark background or dark on a light background. The circle symbol shall contrast with the door, either light on a dark background or dark on a light background per CBC Section 11B-703.7.2.6.3.

L. Edges and Corners: Edges of signs shall be rounded, chamfered, or eased. Corners of signs shall have a minimum radius of 1/8 inch per CBC Section 11B-703.7.2.6.4.

M. PROJECT CONDITIONS

1. Field Measurements: Take field measurements prior to preparation of shop drawings and fabrication to ensure proper fitting. Show recorded measurements on final shop drawings. Coordinate fabrication schedule with construction progress to avoid delay.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. PERMANENT ROOM IDENTIFICATION SIGNAGE

1. Manufacturer: RB Industries, (specified as basis of design) phone 619-448-3930, Apco or approved equal.

2. Type:

a. Exterior: Etched metal signage system, 300 Photomag, 0.125 inch thick magnesium alloy.

b. Interior: Phenolic sheet with photopolymer fused to one side. Thickness: 0.125" min.

3. Graphic Image Process: Process providing raised and braille relief image. Applied message not acceptable.

B. SITE DIRECTIONAL AND INFORMATIONAL SIGNAGE

1. Manufacturer: Vomar, phone (818) 894-7174 or equal.

2. Type: Non-illuminated flat sign panel, aluminum frame, ground set unless noted otherwise.

3. Series: E Series.

4. Size and Construction

a. Sign Image Size: Minimum 9 inches high x 18 inches long. Adjust size as necessary to accommodate message and character size criteria of referenced regulations.

b. Sign Panel Material: 0.080 inch aluminum panel, background painted with PPG Duranar, Kynar 500 fluoropolymer painted finish complying with AAMA 605.2-90, over black fiberglass back-up panel.

C. SITE VEHICLE CONTROL SIGNAGE

1. Manufacturer: Western Highway Products, phone (800)-479-3783, or equal.

2. Provide painted aluminum series, design as shown on drawings and as specified, with H6-TP spanner head vandal resistant fasteners, H-5 spacer and all required mounting components.

3. Concrete: Not Applicable

4. Post: Steel pipe, 3 inch diameter unless noted otherwise, galvanized per Section 05 50 00, finish painted per Section 09 90 00.

D. SAFETY SIGNAGE

1. Provide all interior and exterior safety signage, signage required by jurisdictional authorities, and related signage, including but not necessarily limited to, signs with the following message:

2. "Room Occupancy Limit - XXX". Provide signs at locations shown on drawings.

E. OTHER MATERIALS

1. Provide all other materials, not specifically described but required for complete and proper installation of this work, as selected by the contractor and subject to the approval of the Architect.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General: Locate sign units and accessories where indicated, using mounting methods of the type described and in compliance with the manufacturer's instructions.

1. Install signs level, plumb, and at the height indicated, with sign surfaces free from distortion or other defects in appearance.

2. Tactile Plaques - Room Identification Signage:

a. Background Size: 8" x 8".

b. Typography: Helvetica Medium.

c. Room Number: 1 line, 1-1/2" high.

d. Room Name: 2 lines, 5/8" high.

e. Braille Lines: 2, Contracted Grade 2 Braille directly below number or name.

f. Mounting Height and Location: Signs with raised characters and Braille shall be located 48” minimum to the baseline of the lowest line of Braille and 60” maximum to the baseline of the highest line of raised characters above finish floor or ground surface. Mounting location shall be determined so that a person may approach with 3 inches (76 mm) of signage without encountering protruding objects or standing within the swing of a door. A tactile sign shall be located on the approach side, as one enters or exits rooms or space, and be reached within 0" of the required clear floor space. CBC Section 11B-703.4.2.

3. Tactile Plaques - Accessible Entrance:

a. Size: 8" x 8".

b. Pictogram: International symbol of accessibility, 5/8" thick, 5" high, white paint. CBC Section 11B-703.6.

3.2 INSTALLATION AND PLACEMENT CONSIDERATIONS

A. Install signs after substrate surfaces receive final finish.

B. Where signs are installed in sealant method on glass panels, provide back plate matching sign at opposite side of glass

C. When sign is installed on window surface or other similar recessed conditions, provide spacer as required to maintain sign face within 3 inches of outermost wall plane.

D. Where signs are mounted on gate or fence mesh, sandwich mesh between sign and backing panel of same material and size as sign. Install using sex bolt, tamper resistant fasteners, mounted through aluminum sleeve/spacer.

E. Cleaning and Protection: At completion of the installation, clean soiled sign surfaces. Protect from damage until Owner's acceptance.

END OF SECTION 10 44 00

SECTION 10 28 13 - TOILET ACCESSORIES

PART 1- GENERAL

1.1 SUMMARY

A SECTION INCLUDES

1 Toilet and washroom accessories.

2 Lavatory and sink trap and piping prefabricated wrap kit.

B SUBMITTALS

1 Manufacturer's product data for each toilet accessory item specified, including details of construction relative to materials, dimensions, gages, profiles, method of mounting, specified options and finishes.

PART 2- PRODUCTS

A WASHROOM AND MISCELLANEOUS ACCESSORIES

1 Manufacturer – as applicable:

a Bobrick Washroom Equipment, Inc. 11611 Hart Street; North Hollywood, California 91605. Phone: 1-818-982-9600. Web: www.bobrick.com .

b or approved equal.

2 Finish: No. 4 satin luster, unless noted otherwise.

B Schedule Of Accessories.

1 Soap Dispenser:

(i) B-2111, Classic Series, liquid type, with maximum 5 lb. operating force.

2 Toilet Seat Cover Dispenser:

(i) B-221 Surface Mounted.

3 Toilet Tissue Dispenser:

(i) B-2888, Classic Series, Surface Mounted Multi-Roll Toilet Tissue Dispenser with lock.

4 Toilet Tissue Dispenser:

(i) B-3888, Classic Series, semi-recessed, 3” maximum projection, with lock.

5 Trap and Piping Wrap

(i) Provide TrueBro prefabricated trap and piping insulation kit, LAV Guard 2 E-Z series, with all required accessory fittings, color white. Provide at all lavatories and sink fittings.

6 Waste receptacle and paper towel dispenser.

(i) Recessed waste receptacle B-3644.
(ii) Classic series surface-mounted paper towel dispenser B-262.
(iii) Classic series surface-mounted paper towel dispenser and waste receptacle B-3699.

7 Sanitary napkin disposal, surface mounted B-270.

8 Other Materials

(i) Provide all other materials, not specifically described but required for complete and proper installation of this work, as selected by the contractor and subject to the approval of the Architect.

PART 3- EXECUTION

3.1 General

A Install toilet accessory units in accordance with manufacturer's printed installations instructions, using fasteners appropriate to substrate as recommended by manufacturer of unit. Install units plumb and level, and square at locations indicated, in accordance with manufacturer's instructions for type of substrate involved.

1 Elements of Sanitary facilities shall be mounted at locations in compliance with CBC Sections 11B-602 through 11B-612.

2 Adjust toilet accessories for proper operation and verify that mechanisms function smoothly. Replace damaged or defective items.

3 Clean and polish all exposed surfaces in strict accordance with manufacturer's recommendations after removing temporary labels and protective coatings.

END OF SECTION

SECTION 26 01 00 – ELECTRICAL GENERAL PROVISIONS

PART 1 - GENERAL

1.1 SCOPE

A. Work Included: All labor, materials, appliances, tools, equipment, facilities, transportation, and services necessary for and incidental to performing all operations in connection with furnishing, delivery, and installation of the work of this Section, complete, as shown on the Drawings and/or specified herein. Work includes, but is not necessarily limited to, the following:

1. Examine all other Sections for work related to those other Sections and required to be included as work under this Section.

2. General Provisions and Requirements for electrical work.

1.2 SUBMITTALS

A. General

1. Review of Contractors' submittals is for general conformance with the design concept of the Project and general compliance with the information given in the Contract Documents. Any action shown is subject to the Requirements of the Plans and Specifications. Contractor is responsible for quantities; dimensions which shall be confirmed and correlated at the job site; fabrication processes and techniques of construction; coordination of work with that of all other trades and satisfactory performance of their work.

2. The Contractor shall review each submittal in detail for compliance with the Requirements of the Contract Documents prior to submittal to the Architect. The Contractor shall "Ink Stamp" and sign each item of the submittal with a statement "CERTIFYING THE SUBMITTAL HAS BEEN REVIEWED BY THE CONTRACTOR AND COMPLIES WITH ALL THE REQUIREMENTS OF THE CONTRACT DOCUMENTS".

3. Where the Construction Documents indicate specific Manufacturer(s) for any given product, it shall be considered a substitution if the Contractor proposes to use any Manufacturer other than those specifically named. The Contractor shall clearly and specifically identify each individual proposed substitution or proposed deviation from the Requirements of the Contract Documents with a statement "THIS ITEM IS A SUBSTITUTION".

B. Material Lists and Shop Drawings:

1. Submit Material List and Shop Drawings for approval within 14 days of award of Contract. Give name of Manufacturer and where applicable, brand name, type and/or catalog number of each item. Listing of more than one Manufacturer for any one item of equipment, or listing items "as specified", without both make and model or type designation, is not acceptable.

2. Submittals which are intended to be reviewed as substitution or departure from the Contract Documents must be specifically noted as such or the Requirements

of the Contract Documents will prevail regardless of the acceptance of the submittal.

3. Shop Drawings shall include Dimensioned Plans, elevations, details, wiring diagrams and descriptive literature of components parts where applicable.

4. The Contractor shall verify dimensions of equipment and be satisfied as to fit and that they comply with all Code Requirements relating to clear working space about electrical equipment prior to submitting Shop Drawings for approval.

5. Shop Drawings shall include the Manufacturer's projected days for shipment from the factory of completed equipment, after the equipment is released for production by the Contractor. It shall be the responsibility of the Contractor to ensure that all material and equipment is ordered and installed in time to provide an orderly progression of the work, and to allow full occupancy and full operation of the facility at the scheduled completion date. The Contractor shall notify the Architect of any changes in delivery which would affect the project completion date.

C. The Contractor shall be responsible for incidental, direct and indirect costs resulting from the substitution of specified Contract Materials or work.

D. Maintenance and Operating Manuals

1. The Contractor shall provide Owner with typewritten maintenance and operating manuals for all electrical equipment, fire alarm equipment, sound system equipment, etc., to the District and instruct District's Personnel in correct operation of all equipment at completion of Project.

2. Maintenance and operating manuals shall be bound in three-ring, hard-cover, plastic binders and shall be delivered to the District with letter of transmittal, carbon copy to the Architect.

E. Portable or Detachable Parts: The Contractor shall retain in his possession and shall be responsible for all portable and detachable parts or portions of the installation such as fuses, keys, locks, adapters, locking clips, and inserts until final completion of Contract Work. These parts shall then be delivered to the District, or his Authorized Representative and an itemized receipt obtained, with copies of receipt sent to the Architect.

F. Record Drawings

1. Provide and maintain in good order at the job site a complete set of Electrical Contract prints. Changes to the Contract to be clearly recorded on this set of prints. No pay request by the Contractor will be granted without verification that the jobsite prints are up-to-date and current with the project construction. At the end of the project, the Contractor shall transfer all changes to one set of transparencies to be delivered unfolded to the Architect. Transparency Drawings shall be prepared in an organized and clearly legible fashion by persons skilled in drafting techniques.

2. The actual location and elevation of all buried lines, boxes, monuments, vaults, stub-outs and other provisions for future connections shall be referenced to the building lines or other clearly established base lines and to approved benchmarks. All measurements shall be witnessed by the Job Inspector who shall make his own record of the dimensions. Before the Inspector signs the

Record Drawings, he shall check his own dimensions against those on the Drawings. If any necessary dimensions are omitted from the Record Drawings, the Contractor shall, at his own expense, do all excavation required to expose the buried work and to establish the correct locations.

3. The Contractor shall keep the "Record" prints up to date and current with all work performed.

4. A mandrel shall be pulled through each conduit upon completion of the duct bank. All mandrelling must be done in the presence of the Job Inspector.

1.3 GENERAL SUMMARY OF ELECTRICAL WORK

A. The Specifications and Drawings are intended to cover a complete installation of systems. The omission of expressed reference to any item of labor or material for the proper execution of the work in accordance with present practice of the trade shall not relieve the Contractor from providing such additional labor and materials.

B. Refer to the Drawings and Shop Drawings of other trades for additional details which affect the proper installation of this work. Diagrams and symbols showing electrical connections are diagrammatic only. Wiring diagrams do not necessarily show the exact physical arrangement of the equipment.

C. Before submitting a bid, the Contractor shall familiarize himself with all features of the Building Drawings and Site Drawings which may affect the execution of the work. No extra payment will be allowed for failure to obtain this information.

D. If there are omissions or conflicts between the Drawings and Specifications, clarify these points with the Architect before submitting bid.

1.4 LOCATIONS OF EQUIPMENT

A. The Drawings indicate diagrammatically the desired locations or arrangements of conduit runs, outlets, equipment, etc., and are to be followed as closely as possible. Proper judgment must be exercised in executing the work to secure the best possible installation in the available space and to overcome local difficulties due to space limitations or interference of structure conditions encountered.

B. Where outlets are placed on a wall, locate symmetrically with respect to each other and other features or finishes on the wall.

C. In the event changes in the indicated locations or arrangements are necessary, due to developed conditions in the building construction or rearrangement of furnishings or equipment, such changes made without cost, providing the change is ordered before the conduit runs, etc. and work directly connected to same is installed and no extra materials are required.

D. The locations of existing utilities, building, equipment and conduit shown on the Drawings is approximate. Verify exact locations and routing of existing systems in the field. Include all costs in Contract price for adjustment required to accommodate existing conditions.

E. Coordinate and cooperate in every way with other trades in order to avoid interference and assure a satisfactory job.

1.5 QUALITY ASSURANCE

A. Work and materials in full accordance with the latest Rules and Regulations of the California Code of Regulations Title 24, Part 3 "California Electrical Codes", Title 8 "Division of Industrial Safety", the National Electrical Code, the National Life Safety Code, and other applicable Federal and State Laws and Regulations.

B. All material and equipment shall be new and shall be delivered to the site in unbroken pack-ages. All material and equipment shall be listed and labeled by Underwriters Laboratories or other recognized testing laboratories, where such listings are available. Comply with all installation Requirements and restrictions pertaining to such listings.

C. Work and material shown on the Drawings and in the Specifications are new and included in the Contract unless specifically indicated as existing or N.I.C. (not-in-contract).

D. Keep a copy of all applicable Codes available at the job site at all times while performing work under this section. Nothing in Plans or Specifications shall be construed to permit work not conforming to the most stringent of Codes.

1.6 CLEANING EQUIPMENT, MATERIALS, PREMISES

All parts of the equipment shall be thoroughly cleaned of dirt, rust, cement, plaster, etc., and all cracks and corners scraped out clean. Surfaces to be painted shall be carefully cleaned of grease and oil spots and left smooth, clean and in proper condition to receive paint finish.

1.7 JOB CONDITIONS - PROTECTION

Protect all work, materials and equipment from damage from any cause whatever and provide adequate and proper storage facilities during the progress of the work. All electrical equipment shall be stored in a weather-tight structure. Provide for the safety and good condition of all the work until final acceptance of the work by the District and replace all damaged or defective work, materials and equipment before requesting final acceptance.

1.8 CUTTING AND PATCHING

Perform cutting and patching of the construction work which may be required for the proper installation of the electrical work. Patching shall be of the same material, thickness, workmanship and finish as existing and accurately match surrounding work to the satisfaction of the Architect. Cutting of structural members shall not be done without notifying the Architect and obtaining DSA approval.

1.9 IDENTIFICATION

A. Panelboards, terminal cabinets, circuit breakers, disconnect switches, starters, relays, time switches, contactors, pushbutton control stations, and other apparatus used for the operation or control of feeders, circuits, appliances, or equipment shall be properly identified by means of descriptive nameplates or tags permanently attached to the apparatus and wiring.

B. Nameplates shall be engraved laminated phenolic. Shop Drawings with dimensions and for-mat shall be submitted to the Architect before installation. Attachment to equipment shall be with escutcheon pins, rivets, self-tapping screws or machine screws. Self-adhering or adhesive backed nameplates shall not be used.

C. Tags shall be attached to feeder wiring in conduits at every point where runs are broken or terminated and shall include pull wires in empty conduits. Circuit, phase, and function shall be indicated. Branch circuits shall be tagged in panelboards and motor control centers. Tags may be made of pressure sensitive plastic or embossed, self-attached, stainless steel or brass ribbon.

1.10 TESTING

A. The Contractor shall obtain an independent NETA Certified Testing Laboratory that will provide all instrumentation and tests on the electrical system and equipment as hereinafter described and further directed by the Architect. The test shall be performed after the completion of all electrical systems. All tests shall be recorded and documented and submitted to the Architect for review.

1. Test for Phase to Ground Condition:

a. Open main 208 Volt feeder disconnect in the pool equipment building.

b. Isolate the system neutral from ground.

c. Close all new submain disconnects.

d. Close all branch feeder circuit breakers.

e. Measure the resistance of each phase to ground. A properly calibrated "megger" type test instrument to be used. The test voltage shall be 500 volts.

f. Record all readings after one minute duration and document into a complete report.

2. Isolating Grounds: In the event that low resistance grounds are found in the system, they shall be isolated and located by testing each circuit individually as outlined above. Make proper corrections to restore the resistance values to an acceptable value.

B. Method of obtaining ground resistance shall be in accordance with the latest edition of the James G. Biddle (Plymouth Meeting, Pennsylvania) manual published on this subject.

1. Perform "fall-of-potential" tests on each new grounding electrode of system per IEEE Standard No. 81, Section 8.2.1.5. When suitable locations for test rods are not available, a low resistance dead earth or reference ground will be utilized.

2. Perform the two-point method test per IEEE Standard No. 81, Section 8.2.1.1, to determine the ground resistance between the main grounding system at the new 208 Volt distribution panel and all major electrical equipment frames, system neutral, and/or derived neutral points.

C. All Instrumentation and Personnel required for testing shall be furnished by the Contractor.

D. Take and record ampere and line voltage measurements under full load on all new feeders. Record measurements at the equipment served and submit to the Architect for review.

1.11 POWER OUTAGES

A. All electrical services in all occupied facilities of the Campus are to remain operational during the entire contract period. Any interruption of the electrical power for the performance of this work shall be at the convenience of the District and performed only after consultation with the District. Work involving circuit outages shall be only at such a time and of such a duration as approved in writing. Work involving power outages for the work required to connect new equipment and disconnect existing equipment shall be performed at the convenience of the District.

B. Work involving system outages to the existing fire alarm, intrusion detection, telephone, computer, inter-communications, energy management, television, and/or clock systems shall be performed only after consultation with the District and shall be only at such a time and of such duration as approved in writing.

C. Provide overtime work; double shift work; nighttime work; Saturday, Sunday, and holiday work to meet outages schedule.

D. Any added costs to contractor due to necessity of complying with this Article shall be included in Contract Scope of Work.

E. When electrical work involving power disruptions to existing areas is initiated, the work shall proceed on a continuous basis without stopping until electric power is restored to the affected areas.

F. The Contractor shall request in writing to the District a minimum of 3-weeks in advance, for any proposed electrical outage.

1.12 ELECTRICAL WORK CLOSEOUT

A. Prepare the following items and submit to the Architect before final acceptance.

1. Two copies of all test results and NFPA certificate indicated in the Project Manual.

2. Copies of As-Built Record Drawings as required under the General Conditions, pertinent Division One Sections and Electrical General Provisions.

3. Notify the Architect in writing when installation is complete and that a final inspection of this work can be performed. In the event any defect or deficiencies

are found during this final inspection they shall be corrected to the satisfaction of the Architect before final acceptance can be issued.

END OF SECTION 26 01 00
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SECTION 26 05 00 - BASIC ELECTRICAL MATERIALS AND METHODS

PART 1 - GENERAL

1.1 SCOPE

A. Work Included: All labor, materials, appliances, tools, equipment, facilities, transportation, and services necessary for and incidental to performing all operations in connection with furnishing, delivery, and installation of the work of this Section, complete as shown on the Drawings and/or specified herein. Work includes, but is not necessarily limited to the following:

1. Examine all other Sections for work related to those other Sections and required to be included as work under this Section.

2. General Provisions and Requirements for electrical work.

1.2 SUBMITTALS (ADDITIONAL REQUIREMENTS)

Submit product data sheets for all wooden poles, outlet boxes and junction boxes.

PART 2 - PRODUCTS

2.1 WOOD POLES

Wood poles shall be pressure treated southern yellow pine or Douglas fir, minimum 25 feet long, with minimum 5-inch diameter at top.

2.2 OUTLET AND JUNCTION BOXES

A. Flush or concealed outlet and junction boxes: Pressed steel, hot-dip galvanized, knockout type with conduit entrances sized to match conduits. Provide boxes of proper code size for the number of wires or conduits passing through or terminating therein, but in no case shall box be less than 4 inches square by 2⅛-inches deep, unless specified elsewhere or noted other-wise on the Drawings. Provide extension rings on flush outlets to finish flush with finished surfaces.

B. Surface mounted outlet boxes: Cast iron type FS or FD, with threaded hubs as required. Provide plugs in all unused openings. Provide weatherproof gaskets for all exterior boxes.

C. Boxes shall be brass construction where terminated on brass conduit.

2.3 SHEET STEEL PULLBOXES

A. Sizes as indicated on the Drawings and in no case of less size or material thickness than required by the Governing Code.

1. General purpose sheet steel pullboxes: Install only in dry protected locations with removable screw covers. Manufacturer's standard baked enamel finish.

2. Weatherproof sheet steel pullboxes: Fabricate of Code gauge, hot-dip galvanized steel with gasketed weathertight cover of same material. Manufacturer's standard baked exterior enamel finish.

2.4 STRUCTURAL AND MISCELLANEOUS STEEL

Structural and miscellaneous steel used in connection with electrical work and located out-of-doors or in damp locations, to be hot-dip galvanized unless otherwise specified. Included are underground pull box covers and similar electrical items. Galvanizing average 2.0 ounce per square foot and conform to ASTM A123.

PART 3 - EXECUTION

3.1 POLES

A. Poles shall be set straight and plumb, embedded into the earth a minimum of 5 feet or as noted on plans.

B. Poles supporting aerial cables shall be guyed with steel rope where cable changes direction. Guying method shall include a shorter auxiliary pole embedded 5 feet in the earth within 8 feet of the pole to be guyed. Provide a galvanized 2-inch steel pipe spanning between the poles at +8 feet above grade with steel rope run from the top of the larger pole down to the smaller pole in a “dead man” configuration. Do not install guy wires below +8 feet above grade.

3.2 OUTLET AND JUNCTION BOXES

A. Accurately place boxes and securely fasten to structural members.

B. Boxes above accessible ceilings shall be attached to structural members. Where boxes are suspended, they shall be supported independently of conduit system by means of preformed steel channels. Boxes shall be supported independently of all piping, duct work, equipment, ceiling hanger wires and suspended ceiling grid system.

C. Where surface exposed conduit is connected to an outlet box, the outlet box shall be surface mounted.

D. Surface mounted outlets shall be attached to concrete or masonry walls by means of expansion shields.

E. Provide pullboxes, pulling ells, junction boxes, and condulets on metallic conduit runs whose total number of bends is 360 degrees or greater. Pulling and splicing enclosures shall be located in accessible ceiling spaces unless noted otherwise.

3.3 GROUNDING (ADDITIONAL REQUIREMENTS)

A. Grounding shall be executed in accordance with all applicable Codes and Regulations, both of the State of California and local authorities having jurisdiction.

B. Each pullbox or any other enclosure in which several ground wires are terminated shall be equipped with a ground bus secured to the interior of the enclosure. The bus shall have a separate lug for each ground conductor. No more than one conductor shall be installed per lug.

C. The maximum resistance to ground shall not exceed 25 ohms.

END OF SECTION 26 05 00

SECTION 26 05 30 - CONDUIT AND WIRE

PART 1 - GENERAL

1.1 SCOPE

A. Work Included: All labor, materials, appliances, tools, equipment, facilities, transportation, and services necessary for and incidental to performing all operations in connection with furnishing, delivery, and installation of the work of this Section, complete as shown on the Drawings and/or specified herein. Work includes, but is not necessarily limited to the following:

1. Examine all other Sections for work related to those other Sections and required to be included as work under this Section.

2. General Provisions and Requirements for electrical work.

1.2 SUBMITTALS (ADDITIONAL REQUIREMENTS)

Submit product data sheets for all wire, conduit, fittings, pole hardware, and guying materials.

PART 2 - PRODUCTS

2.1 CONDUIT

A. Rigid galvanized steel conduit: Hot-dip galvanized, zinc coated. Threads shall be galvanized after fabrication. Couplings, connectors, and weather head fittings shall be threaded.

B. Electrical metallic tubing: Galvanized. Couplings and connectors, seamless steel construction and of the set screw or water-tight compression type with factory-applied permanently-attached insulated throat. Thomas & Betts Co. #5123 or #5031 Series or approved equal connectors and #5120 or #5030 Series or equal couplings.

C. Flexible conduit: Galvanized steel. Connector shall be screw-in type with factory-applied permanently-attached insulated throat. Bridgeport #520-DCI/521-DCI Series or equal by Efcor.

D. Liquid-tight flexible conduit: Sealtite Type U.A. with Appleton Series "ST" connectors.

E. Nonmetallic conduit: Polyvinyl chloride, Schedule 40.

F. Seismic deflection/expansion fittings with bonding jumper, O.Z. Type DX Series or equal.

2.2 WIRE AND CABLE

A. Aerial cable shall be individually insulated aluminum conductors with bare steel reinforced messenger, rated 600 volts, type XHHW, sizes as noted on Plans and meeting the following Standards:

1. ASTM B-230 Aluminum 1350–H19 Wire for Electrical Purposes
2. ASTM B-231 Concentric-Lay-Stranded Aluminum 1350 Conductors
3. ASTM B-232 Concentric-Lay-Stranded Aluminum Conductors, Coated-Steel Reinforced (ACSR)
4. ASTM B-399 Concentric-Lay-Stranded Aluminum-Alloy 6201-T81 Conductors
5. ICEA S-76-474 Neutral-Supported Power Cable Assemblies with Weather-Resistant Extruded Insulation Rated 600 Volts
6. RUS Accepted

B. Power wire installed in conduit shall be copper, 600 volt, #12 AWG minimum unless indicated otherwise. Conductors #10 AWG and smaller shall be solid. Conductors #8 AWG and larger shall be stranded. Type of insulation shall be THHN/THWN.

C. Feeders shall be identified as to phase or leg in each panelboard with printed identifying tape. The following color code shall be used for branch circuits:

Neutral . . . White (Tape feeder neutrals with white tape near connections) where separate neutral conductors are indicated for branch circuits, color code the white neutral conductor with a colored stripe corresponding to the phase of the respective line conductors.
<u>120/208 Volt</u>
Ground Green
Phase A Black
Phase B Red
Phase C Blue

PART 3 - EXECUTION

3.1 TRENCHING

Provide trenching, concrete encasement of conduits, backfilling, and compaction for the underground electrical work, in accordance with applicable Sections of this Specification.

3.2 GROUNDING

A. Grounding shall be executed in accordance with all applicable Codes and Regulations, both of the State of California and local authorities having jurisdiction.

B. Where nonmetallic conduit is used in the underground distribution system, the Contractor shall install the proper sized copper ground wire in the conduit with the

feeder for use as an equipment ground. The electrical metallic raceway system shall be grounded to this ground wire.

C. The maximum resistance to ground shall not exceed 25 ohms.

D. Where an equipment bonding ground wire is installed or where nonmetallic or flexible conduit is used for feeder, sub-feeder or branch circuit wiring, a green insulated, copper ground wire, sized in accordance with the following table, shall be installed. Install ground wire in each conduit with phase conductors.

3.3 CONDUIT

A. The sizes of the conduits for the various circuits shall be as indicated on the Drawings and as required by Code for the size and number of conductors to be pulled therein. Conduits to be concealed except as noted otherwise.

B. Rigid steel conduit shall be used where exposed on exterior of building.

C. Rigid galvanized steel conduit shall not be installed in direct contact with earth or sand.

D. PVC Schedule 40 nonmetallic conduit shall be used for all underground runs unless specifically noted or specified otherwise. Nonmetallic conduit shall not be run in slabs or walls, above ceilings or exposed.

E. Risers on underground conduit runs shall be PVC Schedule 40 below grade and rigid galvanized steel where the run turns up above finished grade.

F. Electrical metallic tubing up to and including 4 inch may be installed as permitted by codes except as otherwise referenced within these Specifications.

G. Flexible Steel Conduit:

1. Flexible steel conduit may be used where concealed in walls or above ceilings.

H. Conduit Installation:

1. Rigid steel conduit shall be anchored to structure or other independent supports. Weather heads on conduit risers shall be guyed from the top at 180-degrees to the cable and angled down and anchored to structure.

2. Securely and rigidly support all conduits to building structure. Provide supports maximum of 10- feet on centers and within 3-feet of all bends, outlets, junction boxes, cabinets, panels and fittings. Conduits shall be supported independent of all piping, duct work, equipment ceiling hanger wires, and suspended ceiling grid systems. Secure by means of approved pipe clamps or straps. The use of "plumbers' tape" is prohibited.

3. Individual suspended conduits shall be supported by means of hanger rods and pipe clamps. Multiple suspended conduits shall be supported by means of trapeze type hangers and pipe clamps. Conduits and conduit support systems shall be guyed to prevent swaying in any direction.

4. Individual conduits placed against brick, masonry or concrete walls or slabs shall be secured with pipe clamps and expansion shields. Individual conduits placed

against dry wall or plaster construction shall be secured by means of pipe clamps and screws attached to studs or other structural members. The use of toggle bolts is prohibited. Provide preformed channel supports for all multiple conduits placed against walls or slabs.

5. Conduit run exposed shall be run at right angles or parallel to the walls or structures. All changes in directions, either horizontally or vertically, shall be made with conduit outlet bodies as manufactured by Crouse Hinds or equal. Conduits run exposed shall be painted to match surrounding surfaces.

6. Individual conduits penetrating an exterior wall shall be installed using an approved fire-stop sealant system equal to 3M Corporation FS-195/CP-25 or Hilti Inc. CS240 Series.

3.4 WIRE AND CABLE

A. Attach aerial cables to poles using pole hardware designed for the application. Maintain minimum 15 feet clearance above grade for aerial cables.

B. Branch circuit and fixture joints for #10 AWG and smaller wire shall be made with UL-approved connectors listed for 600 volts, approved for use with copper and/or aluminum wire. Connector to consist of a cone-shaped, expandable coil spring insert, insulated with a nylon shell and 2 wings placed opposite each other to serve as a built-in wrench or shall be molded one-piece as manufactured by "Scotchlok".

C. Branch circuit joints of #8 AWG and larger shall be made with screw pressure connectors made of high strength structural aluminum alloy and UL-approved for use with both copper and/or aluminum wire as manufactured by Thomas & Betts. Joints shall be insulated with plastic splicing tape, half-lapped and at least the thickness equivalent to the conductor insulation. Tapes shall be fresh and of quality equal to Scotch.

D. Use UL listed pulling compound for installation of conductors in conduits.

E. Correspond each circuit to the branch number indicated on the panel schedule shown on the Drawings except where departures are approved by the Architect or the District's Inspectors.

F. Control wiring to conform to the Mechanical and Plumbing Specifications and Wiring Diagrams shown on the Drawings and the Manufacturer's Wiring Diagrams.

G. All exterior wire splices shall be cast resin encapsulated. Power conductor splices - 3M Scotchcast Series 82/85/90; Plymouth or equal.

H. Neatly group and lace all wiring in panelboards, and terminal cabinets with plastic ties at 3-inches on centers. Tag all spare conductors.

3.5 TESTING (ADDITIONAL REQUIREMENTS)

A. Visual and mechanical inspection of cables - 600 volts and less.

1. Inspect cables for physical damage and proper connection.

2. Test cable mechanical connections to Manufacturer's recommended values with a calibrated torque wrench.

3. Check cable color coding and labeling of conductors and spares.

B. Electrical Tests of cables - 600 volts and less.

1. Perform "megger" tests on each feeder and power circuit No. 8 AWG and larger with respect to ground and between conductors.

END OF SECTION 26 05 30
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SECTION 27 10 00 - STRUCTURED CABLING

PART 1 - GENERAL

1.1 SCOPE

A. Work Included: All labor, materials, appliances, tools, equipment necessary for and incidental to performing all operations in connection with furnishing, delivery, and installation of the work of this Section, complete, as shown on the Drawings and/or specified herein. Work includes, but is not necessarily limited to the following:

1. Examine all other Specifications Sections and Drawings for related work required to be included as work under Division 26.

2. General Provisions and Requirements for electrical work.

B. Using the conduits and raceways shown on Plans provide six-strands of multimode and six-strands of single mode fiber optic cabling from the existing MDF indicated on the plans to each new IDF. Provide termination facilities for all cables at existing MDF rack in existing building and at each new IDF rack.

C. Using the conduits and raceways shown on Plans, provide Category 6 cabling from each new IDF to new computer outlets located throughout the Pool facility. Provide Category 6 connectors on patch panel in new IDF rack and in outlet boxes as shown on plans.

1.2 EQUIPMENT QUALIFICATIONS

A. Equipment

1. The equipment shall be covered by an extended performance warranty.

B. Installation Certification

1. Work and material for cables, cable terminations, outlets and related components for infrastructure systems shall be performed by Certified Installers. The Installer shall be certified by the Respective Product Manufacturers.

2. The Manufacturers of the indicated work and material shall provide an Installer education/training and certification program for the supplied products.

3. The Installers performing the Contract work for the indicated products shall have attended and successfully completed each of the respective Manufacturer's installation training education programs for the specified products.

4. Contract material installed, and work performed by Installers not complying with these Requirements shall be removed. Removal of work and material not in compliance with these Requirements shall done at the Contractor's expense, without any additional cost to the Contract and without any additional Contract completion due date extensions. New material and work required to replace the non-compiling removed work and material shall be provided at the Contractor's expense, without any additional cost to the Contract and without any additional Contract completion due date extensions.

C. Extended Material and Performance Warranties

1. In addition to the Warranty Requirements described elsewhere in the Contract Documents, provide the following extended material and performance warranties. The warranty period shall be for not less than 20-years from the Contract Notice of Completion.

2. Warranty scope includes materials and performance for network cables and terminations, network workstation plug-in outlets, and patch panel plug-in outlets, cable splices, and connectors.

3. Repair or replace the defective material with new material at the project premise, to comply with the Performance Standards outlined in the Contract Documents during the warranty period.

1.3 SUBMITTALS (ADDITIONAL REQUIREMENTS)

A. Submit Manufacturer's standard catalog data for each component. The Manufacturer's data sheets shall be marked to indicate the specific item being proposed in cases where the sheet covers several types or sizes of items.

B. Submit Manufacturer's Certifications for each Installer performing the work. The submittal shall be approved by the Owner's Representative prior to initiating any related Contract Work.

C. Submit extended warranty statements.

D. Provide proposed nameplate and outlet identification/color coding system. Indicate proposed identification naming sequence and methods, itemized for review.

1.4 APPLICABLE STANDARDS

A. Individual Component Production/Manufacturer Testing and Labeling.

1. The equipment shall be UL listed, labeled, and approved for the application shown in the Contract Documents.

2. ETL (USA) each network systems infrastructure component. Third party testing, documentation, and certification for performance compliance of each component with the UL, ANSI, and TIA Applicable Standards specified in the Contract Documents.

B. The complete system material, equipment, testing, installation, workmanship, and installed performance shall comply with the Mandatory Requirements and the Guideline/Recommendation Requirements of the following latest published version, supplements, latest revision including Addendums and TSB. Both the mandatory and advisory criteria shall be included as Requirements of the Contract Documents:

1. TIA 526: Optical Power and loss measurements – multimode and single mode fiber.

2. ANSI/TIA/-568C: Commercial Building Telecommunications Standards.

3. ANSI/TIA/-569B: Commercial Building Standards for Telecommunications Pathways.
4. ANSI/TIA/-570A: Residential Telecommunications Standard.
5. ANSI/TIA/-598B: Optical Fiber Cabling Color-coding.
6. ANSI/TIA/-606A: Administrative Standard for Commercial Telecommunications Infrastructure.
7. ANSI/TIA/-607: Commercial Buildings Grounding and Bonding Requirements for Tele-communications.
8. FCC – FYU/FT6.
9. ISO/IEC 11801
10. National Electrical Code (NEC) and California Electrical Code (CEC) including Articles 770 and 800 with ETL verified Testing and Local Code jurisdictions.
11. NECA/NEIS, National Electrical Contractors Association, National Electrical Installation Standards:
    a. 301 – Standard for Installation and Testing for Fiber Optic.
    b. 568 – Standard for Installing Building Telecommunications Bonding and Grounding.
    c. 607 – Telecommunications
12. Manufacturer's recommendations for the respective equipment.

C. The entire completed Electronic Network Systems Infrastructure shall be tested and provide electronic data/network and telephone/voice multi-channel communications latest revisions, Standards and Addendums for the following protocols:
1. IEEE 802.3/ETHERNET latest revisions:
    a. 10Mbps 10Base-T, 100Mbps 100Base-Tx, and 1000Mbps (1Gbps) 1000 Base-Tx for copper wire; 100-meter communications pathway distance.
    b. 10Mbps 10Base-F1, 100Mbps 100Base-FX, 1000Mbps 1000Base-Lx-Sx and 10,000 Mbps (10Gbps) for fiber optics; 550-meter communications pathway distance, OM4 Standard.
    c. IEEE-802.3 for Power Over Ethernet (POE) and Power Over Ethernet-Plus (POE Plus).
2. FDDI - Distributed data interface on fiber or copper wire, 100Mbps.
3. 100VG – Any LAN
4. TIA/EIA serial and Bi-directional RS-232 and RS-485, including Star-Hub repeaters.
5. ANSI - TPPMD 55Mbps, 155Mbps and 622Mbps Asynchronous Transfer Mode - ATM.

D. The complete telephone/voice infrastructure system shall be suitable for the telephone / voice analog and digital communications and VOIP protocols. The system shall be compatible with the telephone/voice equipment installed as part of the Contract.

E. Installation of all infrastructure equipment, devices, splices, terminations, cables, outlets, etc. shall comply with Manufacturer's recommendations.

1.5 ABBREVIATIONS

Abbreviation	Terminology
ACR	Attenuation to Cross Talk.
AHJ	Authority Having Jurisdiction.
Backbone	Circuit interconnections between MDF and IDF patch panel locations.
dB	Decibel.
dBm	Decibel referenced to a milliwatt.
Demarc	Demarcation location where operational control change occurs, or ownership change occurs.
ft.	Feet.
GHz	Gigahertz.
Gbps	Gigabits per second.
Horizontal Connection, and/or Horizontal wiring	Circuit interconnections between individual work-station outlet location to respective IDF or MDF equipment rack patch panel.
IDF	Intermediate Distribution Frame (horizontal or vertical cross connect) for an individual building area/floor.
km	Kilometer-lkm.
kPSI	1000 pounds per square inch.
m	Meter = 39.37 inches.
Mbps	Megabits per second.
MDF	Main Distribution Frame (central/main cross connect) for multi-building site or for a single individual building.
MHz	Megahertz.
MIC	Micrometer
mm	Millimeter = $l0^{-3}$ meter.
NEXT	Near end cross talk.
nm	Nanometer = 10^{-9} meter.
pF	Picofarad = 10^{-12} farad.
Provide	Furnish, install, and connect.
RTDE	Equipment rack mount fiber optic termination distribution enclosure, with fiber optic patch panel.
RMSE	Equipment rack mount fiber optic enclosure, splice only (without patch panel).
STP	Shielded individual twisted pairs copper wire.
ScTP	Shield Screened Twisted Pairs copper wire.
um	Micrometer = 10^{-6} meter.
USE	Universal Splice Enclosure.
UTP	Unshielded twisted pairs copper wire.
VoIP	Voice communications Over Internet Protocol.
WGNA	Wide Band Gigabit Networking Alliance.
Workstation or Workstation location	Spaces remote from the MDF/IDF terminal room/ closet, where user equipment interacts and connects with the electronic systems infrastructure equipment connection outlet device.

PART 2 - PRODUCTS

2.1 FIBER OPTIC CABLES

A. General

1. Operating temperature range - 20 degrees centigrade through +60 degrees centigrade. Cables shall be flame retarding.

2. Electronic network systems infrastructure cables that are not installed inside conduit raceways. Electronic network systems infrastructure cables that are installed in concealed spaces including plenums and non-plenums; access floors, ceiling spaces, walls, floor, etc., and/or installed without continuous raceways. The cable insulation and jacket shall be listed and labeled “Limited Combustible Cable” (LC or LCC) and shall comply with the latest published revision of all the following Additional Requirements.

   a. Limited combustible “FHC-25/50” per UL-2424.

   b. NEC/CEC;CMP, additional listing/labeling where the install location is an environmental air plenum, fiber optic “FHC-25/50-CMP and/or OFNP/ OFCP”.

   c. NFPA-90A; ceiling cavity plenums, wall cavity spaces and raised floor cavity plenums, limited-combustible.

   d. NFPA-5000; defines combustible material including wire and cable.

   e. NFPA-75 computer rooms and electronic equipment rooms.

   f. NFPA-13; spaces containing “limited combustible loading”.

3. Cables shall qualify as 100% recyclable materials disposal, RoHS Regulation complaint.

4. All fibers in a multi-fiber cable shall be fully operational within the performance characteristics specified prior to and after the cable is installed. The use of spare fibers in the cable to compensate for defective fibers is not permitted. Defective cables shall be removed and replaced with fully functional cables at no additional cost to the Contract.

5. Cables shall be UL listed, complying with National Electrical Code, ETL tested and certified to comply with Specified Requirements. ANSI/TIA-568C including related Standards, Amendments, and TSB.

6. Each fiber shall be individually identified with factory color-coding or factory imprinted label. The outer cable jacket shall be imprinted with date, Manufacturer's model, and catalog number, along with Agency Listing Identification.

7. Fiber optic cable shall be a product of the same Manufacturer, including portable patch cables.

8. Cables installed in raceways or conduits below grade, through in-grade manholes or pullboxes shall be rated for installation in water/wet locations.

9. Provide overall outer jacket enclosing all fibers inside jacket. Cables containing less than seven fiber strands shall be provided with a color-coded outer jacket (red or orange).

10. Multimode (50/125)

    a. 50/125 fiber optic cables optical fibers, graded index multimode optical glass fibers, 50.0-micron fiber core and 125-micron fiber cladding, 0.2 numerical apertures. Optical fibers shall be 100 kPSI proof tested, with maximum 0.7-micron flaw size for dual operation at 850nm and 1300nm wavelengths.

    b. Minimum bandwidth:

@ 850nm-wavelength	3500MHz per km length
@ 1300nm-wavelength	500MHz per km length

    c. Maximum attenuation:

@ 850nm-wavelength	3.0dB @ 1km length
@ 1300nm-wavelength	1.0dB @ 1km length

    d. Laser-optimized "OM4" optical multi-mode standards.

11. Single mode:

    a. Fiber optic cables optical fibers, (8.3/125) single mode optical glass fibers, 8.3-micron core fiber and 125-micron fiber cladding, 0.11 numerical aperture. Optical fibers shall be 100-kPSI proof tested, with maximum 0.7-micron flaw size. For operation at 1310nm and 1550nm wavelengths.

    b. Maximum attenuation:

@ 1310nm- wavelength	0.5 dB @ 1km length
@ 1550nm- wavelength	0.4 dB @ 1km length

    c. Maximum dispersion

@ 1310nm- wavelength	2.8 ps/nm km length
@ 1550nm- wavelength	18.0 ps/nm km length

    d. Laser-optimized "OS1"/OS2" optical single mode standards.

B. Indoor/Outdoor Cables

1. The cable shall be fungus resistant, UV resistant, moisture resistant for installation indoors with or without an enclosed raceway and outdoors in under-ground enclosed raceway/conduit and manholes/pullboxes continuously flooded with water, and in conduits exposed to the sun.

2. Each optical fiber shall be primary coated with 500-micron uniform acrylate tight buffered and with elastomeric uniform 900-micron diameter tight buffered, secondary coating. Aramid yarn strength member elements shall be tensioned and symmetrically and uniformly distributed around the fibers, along the length of the cable.

3. An overall cable jacket uniformly extruded directly around and mechanically interlocked with the optical fibers/strength members. The extruded jacket shall form internal helical cusped ridges that interlock with the optical fibers and strength members. The interlocking jacket shall not allow cable fibers to move axially within the cable jacket.

4. Cables containing more than 24-optical fibers shall be constructed with sub-cable fiber bundles. Each sub-cable bundle shall contain equal quantities of optical fibers, with a separate PVC jacket around each sub-cable. Sub-cable and

sub-cable jacket construction shall match the overall Cable Requirements and Jacket Requirements.

5. The cable shall be UL listed and comply with NEC and NFPA Requirements for each installation location shown in the Contract Documents. ETL tested and certified to comply with or exceed Specified Requirements.

   a. CEC -OFNR (Vertical Riser Type Locations) OFNP (UL FHC-25/50 LC Plenum Type Locations and locations where not continuously enclosed inside conduits for entire cable length).

   b. CEC -OFNG (Where continuously enclosed inside conduits for entire cable length).

2.2 COPPER WIRE CABLES (TWISTED PAIRS)

A. General

1. Conductors shall be copper wire, individually insulated and color-coded, with multiple conductors arrange in twisted pairs.

2. An overall non-conductive jacket shall encase the copper wires and any shielding (where shielding is specified) shall also be encased by the jacket.

3. Cables shall be UL listed, complying with NEC National Electrical Code, National Fire Protection Agency and NFPA Requirements for each installation location shown. ETL tested and certified to comply with or exceed Specified Requirements.

   a. CEC-MPP/CMP, FHC-25/50 (plenum type locations and locations where not continuously enclosed inside conduit).

   b. CEC-MPR/CMR (Vertical riser type locations).

   c. ANSI/TIA/-568C; including related Standards, Amendments, and TSB.

4. Electronic network systems infrastructure cables that are not installed inside conduit raceways. Electronic network systems infrastructure cables that are installed in concealed spaces including plenums and non-plenums; access floors, ceiling spaces, walls, floor, etc., and/or installed without continuous raceways. The cable insulation and jacket shall be listed and labeled “Limited Combustible Cable” (LC or LCC) and shall comply with the latest published revision of all the following Additional Requirements.

   a. Limited combustible “FHC-25/50” per UL-2424.

   b. CEC: CMP, additional listing/labeling where the install location is an environmental air plenum, copper wire “FHC-25/50-CMP”.

   c. NFPA-90A; ceiling cavity plenums, wall cavity spaces and raised floor cavity plenums, limited-combustible.

   d. NFPA-5000; defines combustible material including wire and cable.

   e. NFPA-75 computer rooms and electronic equipment rooms.

   f. NFPA-13; spaces containing “limited combustible loading”.

5. Cables shall qualify as 100% recyclable materials disposal, RoHS regulation complaints.

6. Cables installed in air plenums, air handling spaces and cables installed without raceway or conduit shall also be UL listed and labeled for installation in air plenums.

7. The outer cable jacket shall be imprinted with date, Manufacturer's model and catalog number and agency (AHJ) listing identification.

8. Cables installed in raceways or conduits below grade, through in-grade manholes and pullboxes shall be rated for installation in water/wet locations.

9. Copper wire Electronic Network Systems Infrastructure cable shall be a product of the same Manufacturer, including portable patch cables.

10. The outer jacket of cables with less than nine pair of conductors shall be color-coded. The jacket color shall be different for each system type; multimedia; telephone/voice; computer/data network; and fiber cable jackets.

11. 300-volt RMS insulation material for each data conductor shall be the same material; shall be the same electrical characteristics and shall be the same dielectric constant, for all data conductors contained within the respective common cable jacket, along the entire installed length of the cable. Data cables employing differing insulation materials for individual data conductors contained within a common cable jacket are not acceptable and shall not be provided.

12. Propagation and "Skew" Rate

    a. Skew rate (nominal velocity of propagation delay) between any twisted pair in a combination of four twisted pair conductors grouped in the same cable, shall not exceed 35-nano seconds between any wire pair contained in the conductor group, and as required by the cable Category rating, over a cable length of 328-feet (100 meters), for all frequencies up to the cable maximum frequency rating.

    b. Nominal velocity of propagation, exceeding 70% of the speed of light.

B. Category-6 Computer/Data Cables – UTP

1. Category-6 cables and patch cords shall comply with ANSI/TIA-568-C.2 Category 6 and Amendment 1 to ISO/IED 11801:2002 Class E up to 500MHz.

2. Category 6 cables shall be blue in color. Patch cords shall be yellow.

2.3 FIBER OPTIC SPLICES

A. General

1. Fiber optic cable splices shall be UL listed, complying with National Electrical Code, ETL tested and certified to comply with or exceed Specified Requirements, ANSI/TIA/EIA – 568C including related Standards, Amendments and TSB.

2. Fiber optic splices shall be the product of the same Manufacturer.

B. Mechanical Splice

1. Mechanically splice each fiber with a splice suitable for use with the type of fiber optic fibers. Re-enterable and reusable splice. Splice shall be recommended as

compatible with the optical fibers by the Manufacturer. Splice shall not require the use of adhesives. Splice shall provide integral strain relief.

2. Performance Requirements after installation:

a. Operating temperature range minus 20-degrees centigrade through plus 60-degrees centigrade.

b. Loss variation over temperature range, 0.05dB or less at specified wave-lengths.

c. Insertion loss, 0.3dB or less at specified cable wave lengths.

d. Reflection (return loss), -40dB at specified cable wavelengths.

C. Fusion Splicing

1. Fusion splicing shall be performed with equipment providing the following features:

a. Cleaving and cleaning optical fiber.

b. Integral splice optimization verification system with local injection and detection.

c. Projection screen optics and fiber core alignment system.

d. Fiber cleaning/stripping.

e. Cleaning fiber ends and fusing of fiber together with an electric arc.

2. Fusion splice insertion loss as measured at the completion of the splice shall be less than 0.1dB at specified cable wavelengths.

2.4 FIBER OPTIC FIBER CONNECTORS AND INTERCONNECTION COUPLERS

A. General

1. The connectors and interconnection couplers shall be compatible, maintain the same Performance Category rating, and be compatible with the corresponding fiber optic cable type attached to the connectors.

2. Fiber optic cable connectors and interconnection couplers shall be UL listed, complying with National Electrical Code, ETL tested and certified to comply with or exceed Specified Requirements. Connectors and couplers shall comply with ANSI/TIA-568C, related Standards, Amendments, TSB, and TIA-Fiber Optic Connector Intermateability Standard (FOCIS) documentation.

3. Fiber optic connectors and couplers shall be the product of the same Manufacturer.

4. Shall be UL listed and comply with UL94V-0.

5. Color code connectors for fiber optic cables to match the respective fiber optic strand/jacket color.

B. Fiber Optic Fiber Connectors

1. LC – Small Form Factor (SFF) termination connector

a. Ceramic oxide 1.25mm ferrule. Mechanical durability not less than 500-mating cycles. Insertion loss of mated connector shall be less than 0.3dB at specified wavelengths.

b. Strain relief boot, long boot type unless indicated otherwise, short or angled boot type to match the connector installation application. Provide dust cover cap for each connector.

c. Locking type to automatically align mating fibers in the fiber cable and prevent accidental rotation and pullout.

C. Fiber Optic Fiber Interconnection Couplers

1. Interconnection couplers shall be “like-to-like” compatible and shall provide "plug-in" coupling of two fiber optic cable connectors terminated with fiber optic fibers front-to-rear "in-line" together. The coupler shall provide interlocking, automatic optical self-alignment of two mating fiber optic connectors.

2. The centerline to centerline spacing of the interconnection couplers shall allow removal and insertion of portable patch cords, fiber cable connectors for both “single” and “duplex” type fiber adapter connectors without interfering with adjacent connectors.

3. Patch panel mounted interconnections couplers shall be factory pre-mounted to a modular nominal 0.09-inch-thick metal panel, couplers aligned and anchored on the plate.

a. The metal panel shall be predrilled for standard EIA mounting in high-density 19-inch-wide metal patch panel frames.

4. Interconnection couplers in workstation outlets shall be installed in outlet boxes with cover plates.

5. Provide removable dust caps for the front side of each coupler.

2.5 COPPER WIRE OUTLET CONNECTORS

A. Connectors shall be Category 6 complying with ANSI/TIA 568C, female modular jack 8-position/contact "RJ-45" style: related Standards, Amendments.

B. Connectors shall comply with FCC part-68 Subpart F for gold plating.

C. Shall be UL listed and shall comply with UL94V-0

2.6 FIBER OPTIC FIBER DISTRIBUTION ENCLOSURES

A. General

1. Fiber optic fiber distribution enclosures shall be UL listed, complying with National Electrical Code, ETL tested and certified to comply with or exceed Specified Requirements, ANSI/TIA– 568C including related Standards, Amendments and TSB.

2. Fiber optic fiber distribution enclosures shall be the product of the same Manufacturer.

B. Equipment Rack Mount Fiber Optic Termination Distribution Enclosure - RTDE

1. The RTDE enclosure shall mount in an EIA standard 19-inches wide enclosed or open frame equipment rack assembly. The RTDE enclosure shall be metal, painted finish, Manufacturer's standard color.

2. The RTDE shall provide the following self-contained functions internal to the RTDE assembly.

a. Fiber cable termination.

b. Fiber cable "pig-tail" splicing.

c. Fiber cable patch panel.

d. Fiber Cable Management, training, and strain relief.

e. Individual fiber and patching port identification numbers, color-coding of incoming trunk and out-going distribution fiber ports.

f. Plug-in fiber optic interconnection couplers for port-to-port patching with portable fiber optic patch cords.

3. Fiber splice drawers:

a. Horizontal sliding metal drawers adjustable to approximately 30-degree angle when fully open, and removable for easy access. Each drawer shall contain two fiber optic splice trays with tray holders.

b. Drawers shall stack vertically one above the other in the RTDE and allow sufficient slack in all fiber cables for removal of the drawer and splice trays.

c. Provide one sliding drawer and two splice tray assemblies for each group 24-individual fibers or fewer fibers per group) of fiber optic fibers terminated in the equipment rack, but in no case provide not fewer than two sliding drawers with splice tray assemblies in each RTDE.

4. Fiber cable patch panel

a. Metal panel shall provide a patch port for each fiber consisting of metal panel mounted fiber optic interconnection couplers for each fiber optic fiber indicated to be terminated at the RTDE.

b. The fiber optic fiber interconnection coupler shall be provided to match and be compatible with the fiber cable connectors. Quantity shall match quantity of terminated fibers, unless indicated otherwise on the equipment rack schedules.

c. Nominal panel thickness 0.09 inches.

d. Provide a minimum of sixteen unused spaces for additional couplers in the patch panel.

2.7 COPPER WIRE PATCH PANELS

A. General

1. Copper wire patch panels shall be UL listed, complying with National Electrical Code, ETL tested and certified to comply with or exceed Specified Requirements, ANSI/TIA/ EIA-568C including related Standards, Amendments and TSB.
2. Copper wire patch panels shall be the product of the same Manufacturer.

B. Equipment Rack Mounted Patch Panel

1. Patch panels shall be standard EIA 19-inches wide metal panel with a maximum of 48 modular connectors per panel and 24 connectors in a horizontal row, quantity of panels as required for total quantity of connectors. Provide not less than two spare empty rows for future copper wire outlet connectors.
2. The patch panel shall provide the following self-contained functions.
    a. Copper wire cable termination including conductor/shield termination and strain relief.
    b. Plug-in copper wire outlet connectors for port-to-port patching with copper wire portable patch cords.
3. Horizontally mounted, cable support metal bracket shall be provided for each 24-outlet/ connector groupings. The brackets shall be bolted to the equipment rack located at the backside of the patch panel; the brackets shall support and provide strain relief for each incoming copper wire cable connecting to the patch panel.
4. The copper wire connector installed in the patch panel shall be the same configuration, Manufacturer and type as the corresponding copper wire connector provided in the remote workstation outlet locations connecting to the respective patch panel outlet, unless indicated otherwise.

2.8 EQUIPMENT RACK

A. Rack shall be UL listed, wall mounted, steel construction, three-piece “swing-out” design to allow access to rear of equipment mounted in the rack. Rack shall have lockable front door with 12U of rack space, 24” x 24” x 24” in size.

B. Rack shall include an equipment grounding bus and cable management

C. Rack shall be Chatsworth “Cube-It” series or equal.

2.9 SPLICE TRAY FIBER OPTIC FIBERS

A. General

1. Trays shall be suitable for installation in RMSE and RTDE enclosures.
2. The trays shall be the product of the same Manufacturer as the respective enclosures.

3. Splice trays shall be UL listed, complying with national Electrical Code, ETL tested and certified to comply with or exceed Specified Requirements, ANSI/TIA/EIA-568C including related Standards, Amendments and TSB.

B. Splice Trays

1. A metal or non-metal splice tray shall provide space for up to 24-splices of individual fiber cable single mode and multimode optical fibers. The trays shall provide individual splice holder inserts for each splice to adapt the tray for mechanical or fusion splices, with or without splice sleeves.

2. The tray shall incorporate integral fiber tie down clamps, fiber routing rings, provide strain relief and two full 360-degree fiber loops around the tray perimeter with sufficient slack fiber for removal of the tray for access and splicing of the fiber cable. The tray shall insure the minimum bending radius of the optical fibers is not violated.

3. Provide a removable clear plastic tray top cover for each tray, to protect and isolate the fibers.

2.10 WORKSTATION OUTLETS

A. General

1. Cover plates shall be provided with labels behind a built-in protective plastic plate.

2. The outlet cover plates shall be factory pre-punched and formed to accommodate the installed outlet connector with attachment screws.

3. Workstation outlets shall be UL listed, complying with National Electrical Code, ETL Tested and Certified to comply with or exceed Specified Requirements, ANSI/TIA-568C including related Standards, Amendments and TSB.

4. Workstation outlets shall be the product of the same Manufacturer.

B. Computer/Data Workstation Copper wire Outlets

1. The outlets shall be the same configuration and type as the corresponding connector provided in the copper wire patch panel outlet, unless noted otherwise.

2. ANSI/TIA-568C, and related Standards, Addendums and TSB.

3. The copper wire outlet connectors for twisted pair wire connections in computer workstation outlets shall be universal outlet connector RJ-45 type.

2.11 PORTABLE PATCH CORDS

A. General

1. Provide portable patch cords for all copper wire and fiber optic cables.

2. Patch cords shall be factory assembled tested and certified with factory terminated plugs at each end. Field terminated portable patch cords shall not be permitted. Terminated plugs shall incorporate integral bending radius

limiting molded “boots” and strain relief. Patch cord assemblies shall be rated for "heavy duty", “high-abuse” service.

3. Patch cords shall be UL listed, complying with National Electrical Code, ETL tested and certified to comply with or exceed Specified Requirements. ANSI/T1A 568C related Standards, Addendums and TSB.

   a. CEC - OFNG/OFN for fiber optic portable patch cords.

   b. CEC - MPP/CMP/CMR/CMG/MPG for copper wire twisted pair portable patch cords.

4. Patch cords which are not installed shall be delivered to the Owner in cardboard boxes. The patch cords shall be neatly bundled and tied together. Mark each box with quantity and type of cords contained in the box.

5. Patch cords shall comply with the same Cable Communication Performance Requirements, Protocol Requirements and Testing Requirements as the respective infrastructure cables and outlets to which the patch cords are intended to be connected (plug-in). Patch cords shall be the product of the same Manufacturer.

6. The outer jacket of each portable patch cord shall be imprinted with date, Manufacturer’s model and catalog number, and AHJ listing identification.

7. Provide a permanent, visible, factory applied identification number on each end of each patch cord. The identification number shall be the same on each end. However, the numbers shall increase sequentially on each patch cord and shall be unique and not duplicated on other patch cords. Permanently apply the identification numbers on the cable jacket or connectors.

B. Fiber Optic Patch Cords

1. Patch cord quantity: Provide six complete single mode duplex patch cord assemblies and six complete multimode duplex patch cord assemblies. Patch cords shall be 2-feet long and red in color.

C. Twisted Pairs, Copper Wire Portable Patch Cords

1. Twisted Pairs portable patch cords, general:

   a. "Male" eight positions modular "RJ" male style jacks install on each end of the patch cord cable. The jack shall be provided with a rear "fin" to prevent the plug tab from snagging when pulled backwards through adjacent wiring. RJ-45 style “male” jack, typical unless noted otherwise.

   b. Patch cord cable shall be UTP ANSI-Category 6A rating, shall match respective premise wiring, 4-pair twisted, stranded copper individually insulated wires, thermoplastic jacket over all the wires.

   c. Connectors shall comply with FCC 68.5 and Part 68 Subpart F.

   d. Connectors UL listed and shall comply with UL-94V-O.

   e. Contacts gold plated with not less than a 750 insertion/with drawl cycle rating.

2. Portable patch cord quantities and lengths for connecting port-to-port equipment rack patch panels

   a. Patch cord quantity: Provide one complete patch cord assembly for each copper wire equipment workstation outlet patch port in the equipment rack patch panels. One-to-one straight through pin-to-pin wiring.

PART 3 - EXECUTION

3.1 STRUCTURED CABLE TESTING (ADDITIONAL REQUIREMENTS)

A. General

1. Provide end-to-end test of all individual optical fiber, individual copper wire conductors, each outlet and each connector in all terminated and unterminated cables, portable patch cord, outlets and patch panels provided in the Contract. Items shall be tested after installation as a complete channel pathway installation, splicing outlets and termination is completed.

2. The test equipment and (Tester) shall comply with the Accuracy Requirements for Field Testers as defined in the ANSI/TIA Standards for the specific cable type. The Tester including the appropriate interface adapter shall meet the specified Accuracy Requirements. The Tester shall be within the calibration period recommended by the Vendor to achieve the Vendor-specified measurement accuracy. The Tester shall be calibrated to extend the reference plane of the Return Loss measurement to the permanent link interface. The Contractor shall provide proof that the interface has been calibrated within the period recommended by the Vendor.

3. The Pass or Fail condition for the channel pathway link-under-test is determined by the results of the required individual tests (ANSI/TIA) any Fail result yields a Fail for the link-under-test. To achieve an overall Pass condition, the results for each individual test parameter must Pass. A Pass or Fail result for each parameter is determined by comparing the measured values with the ANSI/TIA test limits for that parameter. The test result of a parameter shall be marked with an asterisk (*) when the result is closer to the test limit than the accuracy of the field test. The Field Test Equipment Manufacturer shall provide documentation as an aid to interpret results marked with asterisks.

4. Provide all Test Equipment, Certified Testing Personnel, and setups. Shall comply with ANSI/TIA and Equipment Manufacturer’s recommendations and standards of practice.

5. Provide electronic copy of all test reports to Owner’s Representative.

6. The Contractor shall repair or replace equipment, cables, outlets, connectors, splices, terminations, etc. identified during testing as not complying with the Contract Documents, without additional cost to the Contract. Retest all replaced or repaired components at Contractor's expenses.

B. Twisted Pair Copper Wire paths shall be tested for Cat 6A performance.

C. Fiber Optic Cable Testing:

1. Channel link insertion losses (dB) OLTS.
2. Channel loop-back attenuation (dB).
3. Channel signature optical time domain reflectometer OTDR for installation characterization testing (event and attenuation resolution dead zone at specified wavelengths, shall be less than 10-feet).
4. Channel continuity and correct point-to-point matching terminals.
5. Channel propagation delay and propagation speed.
6. Channel fiber optic mapping, circuit length, and tracing.

3.2 CABLE INSTALLATION

A. General

1. Cables connecting to equipment racks and terminal blocks shall be installed with not less than 6-feet of slack cable between the equipment rack/terminal block and terminal back-board. The slack cable shall be coiled and supported on the backboard and/or cable tray.
2. Cables in terminal closets and terminal rooms shall be trained, dressed and racked on the plywood backboards. Provide cable, metal support arms and re-enterable type cable support rings not less than 12-inches on center mounted onto the plywood along the entire length of all cables.
3. Provide separate routing paths on plywood backboards for fiber optic cables, computer data and copper wire cables and telephone/voice copper wire cables and multimedia, audio/video, TV cables. Provide separate routing paths on plywood backboards for shielded copper wire cables and unshielded copper wire cables.
4. Cables shall be routed parallel to floors and walls. Do not route cables diagonally on backboards.
5. Spare cable slack
    a. Provide 25-feet of cable slack where un-terminated cables are specified at terminal backboards.
    b. Provide a minimum of 18-inches of slack cable in each workstation outlet box and outlet locations.
    c. Provide 10-feet of cable slack in ceiling above each workstation outlet.
    d. Provide 24-inches of slack in each cable at patch panel locations.
    e. Use Velcro straps to secure cables
6. Provide “horizontal wiring” cables installed from individual equipment locations and workstation outlets to respective MDF/IDF terminal closet/room patch panel. Cables shall be continuous without cutting or splices.
7. Provide “backbone” cables installed from each IDF location to respective MDF/ Sub-MDF location terminal closet/room patch panels. Cables shall be continuous without cutting or splices.

B. Cable Pulling Lubrication

1. Cable pulling lubricants shall be specifically approved by the Cable Manufacturer. The following lubricants shall be used where approved by the Cable Manufacturer.

   a. Slip X -300, American Colliod Co.

   b. Bishop #45, Bishop Electric.

   c. MacLube CA51, MacProducts.

   d. Minerallac H2B, - Minerallac Electric.

   e. Winter grade #7437-PC, General Machine Products.

   f. Gel-lube 7/5, Cable associates.

   g. Polywater, A, C, G - American Polywater.

2. Lubricants shall be continuously applied as cable enters raceway.

C. Cable Installation:

1. Do not pull conductors until factory test reports have been submitted and reviewed.

2. Minimum bending radius of fiber optic cables shall not be less than the following. Maximum pulling tension shall not exceed the following. In no case shall the Manufacturer's recommendations be violated.

Cable Type	Cable Fiber Quantity	Min. Bend Radius	Max. Pulling Tension
Loose Tube	2-84	9 inches	600 pounds
Loose Tube	86-192	10 inches	600 pounds
Indoor/outdoor	2-12	5 inches	400 pounds
Indoor/outdoor	14-24	7 inches	600 pounds
Indoor/outdoor	26-28	11 inches	1100 pounds
Indoor/outdoor	48-72	12 inches	1200 pounds

3. The minimum bending radius for copper wire cables shall be ten times the cable outside diameter. The maximum pulling tension and minimum bending radius shall not violate Manufacturer's recommendations.

4. Cables installed in pullboxes on terminal backboards shall be installed on wall mounted cable support racks.

5. Provide a full 360-degree loop of cable around pullbox interiors.

6. For each cable pull where a cable direction change is required, flexible feed-in tubes, pullout devices, multi-segmented sheaves etc. shall be used to ensure proper cable pulling tensions and side wall pressures. Cables shall not be pulled directly around a short right-angle bend. Any device or surface the cable comes in contact with when under pull-in tension shall have a minimum radius 50% greater than the final specified minimum installed cable-bending radius. The maximum possible size radius sheaves and feed-in tubes, usable in the available working space, shall be provided in all situations, to insure the minimum possible cable side-wall pulling pressure. Do not use devices with multi-segment "roller" type sheaves.

D. Movement, Storage, and Handling of Cable:

1. Reels of cable shall not be dropped from any height, from trucks or other transporting equipment.

2. Lift and move cable reels using following methods:

a. Crane or boom type equipment-insert shaft (heavy rod or pipe) through reel hubs and lift with slings on shaft, with spreader or yoke to reduce or avoid sling pressure against reel head.

b. Forklift type of equipment may be used to move smaller, narrower width reels. Fork times should be placed so that lift pressure is on reel heads, not on cable, and shall reach all the way across reels so lift is against both reel heads.

c. Reels may be moved short distances by rolling. Reels shall be rolled in the direction indicated by arrows painted on reel heads. Surfaces over which the reels are to be rolled shall be solid clear of debris, and clear of protruding stones, humps, etc. which might damage the cable if the reel straddles them.

3. Storage of reels of cable:

a. Cable ends shall be sealed prior to shipment to prevent moisture entry into cable. Cable ends shall remain sealed at all times including during installation.

b. Cable reels shall be shipped with factory applied lagging (protective cover) left in place until removal is absolutely necessary. Additional covering such as tarpaulin, plastic sheeting, etc. shall be used if cable is to be stored outdoors.

3.3 CABLE TERMINATIONS

A. General

1. Infrastructure workstation outlets connecting to ports in patch panels and terminal blocks shall be grouped together in the patch panel and terminal block by outlet function, room location and building area location. Each group shall be identified with engraved (etched) nameplates indicating grouping identification and individual port numbers.

2. Polarity and color-coding of cable connections at splices, terminations, and outlets shall be consistently maintained throughout the entire electronic network system.

3. Terminate all cables onto respective outlets connectors, interconnection couplers and terminals. Terminations shall comply with Manufacturer's recommendations, ANSI/TIA-568C related Standards, Amendments, and TSB.

4. Fiber optic cable fiber strands and copper wire cable conductors terminated at outlet locations shall be connected with a strain relief device attached to the cable jacket to prevent cable tension from being transmitted to the termination connectors.

5. Cable terminations shall be performed to maintain the data transmission rates specified for respective entire system.

B. Fiber Optic Terminations

1. Individual fiber optic fibers shall each be terminated with a fiber optic LC type fiber connector. The connector for each fiber shall be "plugged" into separate fiber optic fiber interconnection couplers on the rear of each respective outlet.

2. Each fiber optic termination ferrule shall be inspected, after completion of the termination, visually with a fiber optic inspection microscope and an interferometer, to ensure fiber “undercut”, “protruding” fiber, over polish and under polish of fiber termination ends does not exist in the finished termination ferrule.

3. Fiber optic cables terminated between two fiber optic patch panels located in separate equipment racks. The fibers shall be paired together (Duplex-Pair) for purposes of identification and connection transmit/receive pair. Each pair of connectors for fibers shall be "plugged" into separate, physically adjacent fiber optic fiber duplex-pair interconnection couplers at each patch panel. The horizontal/vertical arrangement of paired patch panel fiber couplers shall match at both ends of the fiber cable.

4. Fiber optic cable fiber strands terminated at patch panels shall be installed with a minimum of 540 degrees of each fiber strand looped around the splice tray individual fiber “training” rings.

5. Fiber optic cable connecting from infrastructure workstation outlet to a fiber optic patch panel.

   a. The connectors for fibers shall be "plugged" into separate, physically adjacent fiber optic fiber interconnection couplers.

   b. The patch panel coupler shall be color coded to identify the polarity of the transmitting and receiving optical fibers.

6. Fiber optic cable connections at workstation outlets.

   a. The connectors for fibers shall be "plugged" into separate physically adjacent fiber optic fiber interconnection couplers in the outlet.

C. Copper Wire Terminations

1. Where occurs, the shield on metal shielded copper wire shall be terminated and connected to the shield grounding connection at each termination point.

2. Twisted wire pairs shall not be untwisted for a length of more than 0.4 inches at any location and the cable jacket shall not be striped back not more than 0.5 inches any location including splices and terminations.

3. Unless specifically directed otherwise by the Owner's Representative, Pin assignment for wiring terminations shall comply with ANSI/TIA 568C type T568A or Type T568B as required to match the existing campus. The termination type shall be consistent throughout the Project Contract area.

4. Copper wire terminations shall be performed to maintain the transmission rates specified for the respective entire system.

3.4 EQUIPMENT RACKS

A. General

1. Install, assemble, mount and connect devices and equipment in the respective equipment racks, bolted securely to the rack frame with stainless steel hardware. "Star" style lock washers shall be provided to insure an electrically continuous ground path between the equipment/devices and rack frames.

2. Provide a copper wire outlet connector in the respective equipment rack for each remote copper wire infrastructure workstation outlet and copper wire cable shown connected to the respective equipment rack, plus the spare copper wire outlet connectors required in the Contract Documents. The copper wire outlet connectors in the equipment racks shall be provided in equipment rack mounted copper wire patch panels. In no case shall the quantity of equipment rack mounted copper wire outlet connectors be less than the quantity of cables indicated on the Drawings, plus required spaces/spares.

3. Provide fiber optic fiber connectors and fiber optic fiber interconnection couplers in the respective equipment rack for each remote fiber optic infrastructure workstation outlet, and fiber optics cable fiber shown connected to the respective equipment rack, plus the spare fiber optic fiber optic fiber connectors required in the Contract Documents. The fiber optic fiber connectors and fiber optic fiber interconnection couplers in the equipment racks shall be provided in equipment rack mounted fiber optic fiber distribution enclosures (RTDE) in no case shall the quantity of equipment rack mounted fiber optic fiber connectors and fiber optic fiber interconnection couplers be less than the quantity of cables indicated on the Drawings, plus required spaces/spares.

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SECTION 27 41 19 – PORTABLE ASSISTIVE LISTENING SYSTEM

PART 1 - GENERAL

1.1 SCOPE

A. Work Included: All labor, materials, appliances tools, equipment, facilities transportation, and services necessary for and incidental to performing all operations in connection with furnishing, delivery and installation of the work of this Section, complete as shown on the Drawings and/or specified herein. Work includes, but is not necessarily limited to the following:

1. Examine all other Sections for work related to those other Sections and required to be included as work under Division 26.

2. General Provisions and Requirements for electrical work.

1.2 SUBMITTALS (ADDITIONAL REQUIREMENTS)

Submit block wiring diagrams and catalogs data showing component interconnection and descriptive literature for all component parts and cabinets.

1.3 EQUIPMENT QUALIFICATION

All Equipment shall conform to Federal, State and Local applicable Codes, Ordinances and AHJ, and shall be listed and labeled by Underwriters Laboratories.

1.4 REGULATORY REQUIREMENTS

A. Assistive-listening systems shall be provided in accordance with CBC Section 11B-219 and shall comply with CBC Section 11B-706.

B. The minimum number of receivers to be provided shall be equal to 4% of the total number of seats, but in no case less than two. 25% minimum of receivers provided, but no fewer than two shall be hearing aid compatible in accordance with CBC Section 11B-706.3.

Capacity of Seating in Assembly Area	Minimum Number of Receivers	Minimum Number of Receivers Hearing-Aid Compatible
50 or less	2	2
51 to 200	2, plus 1 per 25 seats over 50 seats	2
201 to 500	2, plus 1 per 25 seats over 50 seats	1 per 4 receivers
501 to 1000	20, plus 1 per 33 seats over 500 seats	1 per 4 receivers
1001 to 2000	35, plus 1 per 50 seats over 1000 seats	1 per 4 receivers
2001 and over	55, plus 1 per 100 seats over 2000 seats	1 per 4 receivers

C. Provide a sign in each classroom and assembly area including the symbol for hearing loss in compliance with CBC 11B-216.10 and 11B-703.7.2.4.

D. If the system provided is limited to specific areas or seats, then such areas or seats shall be within a 50-foot viewing distance of and have a complete view of the stage or playing area. CBC Section 11B-219.4.

PART 2 - PRODUCTS

2.1 GENERAL

A. The Assistive Listening System shall include the following items:

1. Instructor (program source) wireless transmitter units.
2. Student (audience) portable wireless receiver units.
3. Plug-in microphones and earphones, for each unit.
4. Multiple program source inputs for, Instructor's microphone, respective room audio/video A/V system input/output and Instructor's computer audio input/ output.
5. System accessories.

B. Function

1. The Assistive Listening System shall provide amplified available audio programs for hearing impaired students/audience, originating from classroom/stage/room instructors and audio/video instructional program source materials, and equipment in respective building spaces, rooms, classrooms, and outdoor areas.
2. The audible program shall be transmitted wireless from the program source to the student/audience, with reception coverage throughout not less than approximately 80% of the respective floor space/area space.
3. Shall provide automatic stereo or mono audio full system operation, depending on program source input.
4. The system in each space shall comply with Federal ADA, State and Local AHJ Requirements for the hearing impaired.

2.2 MATERIAL (INFRARED WIRELESS)

A. General

1. All equipment shall be the product of the same Manufacturer.
2. The receivers and transmitters shall be US Government FCC and Industry Canada-approved.
3. Provide power on-off control on each unit, to extend battery duration.
4. As manufactured by Williams Sound; or PhonicEar; or Listen Technologies; or Centrum Sound.

B. Master (Program Source) Transmitter (Infrared Emitter) Units

1. The infrared emitter/transmitter shall be compact, portable units, self-contained ABS/plastic housing/enclosure.

2. The emitter panel shall be a dual-channel system operating on both 2.3 and 2.8MHz invisible infrared light waves' frequencies. The channels shall be designated "CHANNEL A" for the left and "CHANNEL B" for the right.

3. The emitter shall provide left and right AUDIO IN jacks to accept an input signal from a sound system, left and right "SYNC IN/SYNC OUT" jacks for master/slave daisy-chaining with other emitters if desired, and left and right "MIC-IN" jacks to accept an audio signal from a microphone or Audio/Video preamplifier.

4. The emitter shall provide separate LED input level detectors for each channel which illuminate when the audio signal peaks. Stereo and mono audio processing.

5. The emitter shall be mounted by the following methods:

   a. Portable mounted to a table-top-or floor-stand, using accessory support-stand adapter.

6. Each emitter shall provide an array of not less than 130 infrared LEDs covered by an infrared transparent acrylic lens. The infrared signal from each emitter shall cover not less than 3,000 square feet (32,000 cubic feet) enclosed space. Note: For room sizes smaller than 3,000-square feet, the infrared transmitter/emitter infrared output shall be reduced to accommodate the actual smaller room square feet size and height.

7. 120-volt 60Hz AC input to nominal 24-volt DC output (plug-in "power-brick") power supply external transformer shall be UL approved, with cable "plug-in" connection to emitter/transmitter. Provide remote system master on-off control.

8. Slave emitter/transmitter for rooms exceeding 30,000-cubic feet. Provide one additional infrared emitter/transmitter repeater slave unit, for each additional 30,000-cubic feet room volume, or fraction thereof. The slave repeater shall receive and retransmit the program signals from the master unit. Provide one 100-foot long "master-to-slave" auxiliary portable extension wire cable for each slave unit.

9. Provide a quantity of nine emitter/transmitter "master" units, plus additional "slave" units for adjusted room sizes.

C. Student/Audience Receiver Units

1. Battery Power

   a. Power for each unit operation shall be supplied by internal, changeable recharge-able NiCad batteries and alternately by alkaline disposable batteries. Rechargeable batteries shall be recharged without removal from the unit. Each unit shall have a charging indicator light. The batteries shall be recharged from either a portable charger/organizer and with wall transformer/two-unit chargers. The units shall operate for up to 40-hours with alkaline batteries, and up to 15-hours with NiCad (NiMH) batteries.

   b. Provide power on-off control on each unit, to extend battery duration.

c. A protection circuit shall prevent battery "back-drain" if the power to the charger is turned off while the unit is being recharged.

2. The receiver shall be a dual-channel unit for wearing around the neck with an adjustable strap. Stereo and mono audio reception and processing.

3. Compatible with the transmitter (emitter) and operate on 2.3 and 2.8MHz frequencies invisible infrared light waves. Self-contained and switchable from "CHANNEL A" to "CHANNEL B" through a switch located on the back of the unit.

4. The receiver shall provide an infrared light-gathering lens on the front of the unit to focus the light signal from the emitter onto the infrared detector element. The receiver shall detect and decode the infrared emitter/transmitter light source within a 160-degree acceptance angle.

5. Audio squelch circuit which turns the output circuit off when the infrared signal is reduced or not received, with on/off and volume control.

6. Output jack, which accepts any of the listening accessories. Headsets shall provide magnetic induction pick-up for hearing impaired, hearing aid interface operation.

7. Shall be compact easily portable units, self-contained ABS/plastic housing/ enclosure with red infrared receiver lens. Shall clip to pocket or belt.

8. Provide quantity of four infrared receivers for each master transmitter.

D. Infrared System Accessories

1. Battery recharger portable charger/organizer pack.

   Locking, portable case with cover, shall accept a group of not less than twelve plug-in portable transmitters and receivers' units in each pack for simultaneous multi-unit battery recharging. Provide a quantity of one organizer for each quantity group of twelve (or fraction thereof) receivers provided as part of the Contract.

2. Stereo audio headset style automatic noise canceling microphones, integral on-off-volume control and with behind the neck support style. Each with 25-feet long extension cables and outlet plug-jacks to match transmitter outlet jacks. Provide two cables for each emitter/transmitter.

3. Equipment wall mount support brackets.

4. Auxiliary audio program source 15-feet long cables with plug-in at both ends to match transmitter jacks. Provide two for each transmitter.

5. Headset style earphones with cable and plug to match receiver jacks. Headsets shall provide magnetic induction pick-up for hearing impaired, hearing aid interface operation. Provide one headset for each receiver.

6. Rechargeable Ni-Cad (NiMH) batteries, one complete set for each unit.

7. Locking auxiliary equipment storage cases for cables, microphones, and headsets. Quantity and capacity as required to store all accessories.

8. Portable floor stand, for infrared emitter/transmitter units mounting and support, with variable height adjustment and tip-resistant weighted base. Provide one floor stand for each infrared emitter/transmitter.

9. Locking, portable case for infrared emitter/transmitter. One for each emitter/ transmitter unit.

10. Provide microphone extension cable with plug to match microphone and infrared emitter/transmitter microphone input jack, 25-feet length. One for each microphone.

PART 3 - EXECUTION

3.1 GENERAL

A. Each System General

1. Assemble, set up, and test each transmitter, receiver, and accessories units.

2. Install and fully charge all batteries prior to and after testing/set up are complete.

B. Wireless Infrared Units

1. Provide aiming and intensity adjustments of emitter/transmitter units to insure complete room coverage.

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SECTION 27 60 20 - AUDIO/VIDEO CABLING SYSTEM

SECTION 1 – GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specifications apply to work of this Section.

1.02 SCOPE OF WORK

A. The work under this section includes all labor, material, equipment, supplies, labor, testing, and accessories required to furnish and install complete Audio/Video links as indicated on the drawings and as specified herein.

B. It is the intent of the Drawings and Specifications for the Contractor to provide and install a complete, fully operational, and tested system.

C. All miscellaneous system components including, but not limited to, cables, termination equipment, punch blocks, patch panels, backboards, dedicated power provisions, as well as any other related items, shall be furnished and installed complete under this section, such that the system shall perform all functions listed herein in compliance with all of the specified requirements.

1.03 GENERAL REQUIREMENTS

A. The contractor shall hold a valid State of California C-7 Low-Voltage and C-10 electrical license, shall have completed at least 20 projects of equal scope, shall have been in business of furnishing and installing systems of this scope and magnitude for at least five years, and capable of being bonded to assure the owner of performance and satisfactory service during the guarantee period.

B. The contractor shall hold all other licenses required by the legally constituted authorities having jurisdiction over the work.

C. Contractor to be Leviton Certified Installer.

D. The installing contractor shall be a factory authorized distributor and warranty station for the brand of equipment offered and shall maintain a fully equipped service organization capable of furnishing adequate repair service to the equipment. The installing contractor shall maintain a spare set of all major parts for the system at all times. All system components shall be 100% backed up with stock at contractors shop.

E. All of the equipment in this specification shall be furnished and installed by the Factory Certified Installer of the equipment.

F. If applicable, all of the equipment in this specification shall be furnished and installed with the most current software package available at the time of installation. At the time of Owner Acceptance of the installation, all equipment shall include any and all updated software revisions. In addition, when the software is available in disk format, a backup copy of the most up to date revision shall be handed to the Owner at the completion of the project.

G. The Audio/Video contractor shall maintain sufficient stock on hand and have a fully equipped service organization capable of guaranteeing response time within 8 hours of service calls, 24 hours a day, 7 days a week to service completed systems.

H. Equipment, wire and materials should only be installed by the Audio/Video contractor. An installation company other than the Audio/Video contractor is not allowed. A separate electrical contractor may provide and install conduit and boxes only for this system.

I. The Audio/Video contractor shall provide, install and test all equipment related to this section.

1.04 QUALITY ASSURANCE

A. In order to maintain a high degree of quality assurance, the contractor shall, without exception, use the parts and supplies as specified in this specification.

B. It is the intent of these specifications to establish a standard of quality for labor and material to be installed. The Base Bid shall include materials as specified - without exception.

C. In order to establish quality and standards of performance of equipment and match the District's Standard, the specified equipment for the Audio/Video links is that of Extron All mechanical, electrical and general information set forth on the respective data sheets for each specified item shall be considered as part of these specifications and binding herein. No substitutions Allowed.

1.05 SUBMITTAL AND MANUAL

A. Submittal requirements of this section are:

1. Within thity-five (35) calendar days after the date of award of the Contract, the Contractor shall submit eight copies of the complete submission to the Architect for review.

2. The submission shall consist of five major sections with each section separated with index tabs. Each page in the submission shall be numbered chronologically and shall be summarized in the index.

3. The first section shall be the "index" which shall include the project title and address, name of the firm submitting the proposal and name of the Architect.

4. The second section shall include the following items:

a. CONTRACTOR'S LICENSE: A copy of the electronics contractor's valid State of California License.

b. PROOF OF EXPERIENCE:Proof that the Audio/Video contractor has been regularly engaged in the business of Audio/Video cabling contracting consisting of, but not limited to, engineering, fabrication, installation, and servicing of cabling systems of the type specified herein for at least the past ten (10) consecutive years. Provide a statement summarizing any pending litigation involving any officer or principal of/or the company, the nature of the litigation and what effect the litigation may carry as it relates to this work in the worst-case scenario. Non-disclosure of this item, if later discovered, may result, at the owner's discretion, in the contractor bearing all costs and any cost related to associated delays in the progress of the work.

c. INSURANCE CERTIFICATES: Copy of Audio/Video contractor's current liability insurance and state industrial insurance certificates in conformance with the contract documents.

d. PROJECT LIST: A List containing at least ten (10) California installations completed within the last five (5) years by the Audio/Video contractor that are comparable in scope and nature to that specified in the contract document.

e. SERVICE CAPABILITY: Documentation indicating in detail that the Audio/Video contractor has competent engineering, installation, service personnel and facilities with reasonable stock of service parts within 100 air miles of the job site.

f. CERTIFICATION: Documentation of Leviton Certifications.

g. PROOF OF TRAINED PERSONNEL:

5. Documentation that the Audio/Video contractor has on staff personnel factory-trained and certified for the equipment proposed for this project. Also, a statement that personnel meeting these qualifications are in the local facility, and will be maintained at that facility throughout the project and the warranty period.

6. The third section shall contain the comparative specification listing, including a complete listing of the characteristics of the equipment to be furnished next to all of the specified equipment's features and functions as stated in the specifications and data sheets.

7. The fourth section shall contain an original factory data sheet for every component in the specifications.

8. The fifth section shall contain a designation schedule for each Audio/Video Link location and complete 1/8" = 1'-0" scale drawing showing system wiring plans.

a. Riser Diagram.

b. Typical Device Wiring Diagram.

c. Wire Legend.

d. Floor Plans showing all conduits, sizes, and quantity of conductors.

e. Mounting Height of each devices and back box requirement.

C. Failure to comply with all of the requirements listed above will result in the rejection of the entire submittal package.

D. The Contractor shall provide two copies of an "Operating and Servicing Manual" for the system. The manuals shall be bound in flexible binders. All data shall be printed material or typewritten. Each manual shall include the following:

1. Instructions necessary for the proper operation and servicing of the system.

2. Complete as-built installation drawings of the system.

3, A wiring destination schedule for each circuit leaving for each piece of equipment.

4. A schematic diagram of major components and replacement numbers.

1.06 GENERAL SYSTEM PRODUCT, INSTALLATION AND OVERALL SYSTEM WARRANTY

A. Prior to Owner acceptance, the contractor shall provide to Owner, a manufacturers product and performance warranty. This will require a submittal of the required pre-job certification registration forms as well as the required project closing information. The Owner will only acknowledge acceptance upon submittal of a valid manufacturers warranty.

B. The warranty shall commence from the date of final written acceptance by the Owner.

C. All conditions for obtaining the manufacturers warranty shall be the sole responsibility of the contractor.

D. The contractor shall maintain a competent service organization and shall, if requested, submit a service maintenance agreement to the owner after the end of the guarantee period.

E. A typewritten notice shall be posted at the equipment rack that shall indicate the firm, address and telephone number to call when service is necessary. The notice shall be mounted in a neatly finished metal frame with a clear plastic window and securely attached to the inside of the door.

1.07 SPECIFIC SYSTEM PRODUCT, INSTALLATION AND OVERALL SYSTEM WARRANTY

A. The entire system shall be warranted free of mechanical or electrical defects for a period of one (1) year after final acceptance of the installation. Any material showing mechanical or electrical defects shall be replaced promptly at no expense to the Owner.

1.08 ACCEPTABLE MANUFACTURERS

A. All equipment listed herein will be by Extron. No Substitutions Allowed.

B. It is the responsibility of the bidder to insure that the proposed product meets or exceeds every standard set forth in these specifications and the equipment's technical data sheets.

C. The functions and features specified are vital to the operation of this facility. Therefore, inclusion of a component's manufacturer in the list of acceptable manufacturers does not release the contractor from strict compliance with the requirements of this specification.

D. All basic electronic equipment (not including cable) specified herein shall be produced by a single manufacturer of established reputation and experience who shall have produced similar apparatus for at least three or more years and who shall be able to refer to similar installations rendering satisfactory service.

1.09 SYSTEM FUNCTIONS AND CAPABILITIES:

A. The system will provide audio/video link between the Teacher’s location and the Display location. This shall be accomplished by providing cabling between locations with 4K resolution HDMI Cable. Teacher’s Display will be sent to wall mount 80 Smart TV.

B. TV Mount shall be mounted in center of white board. Power to be provided at TV location. Data drop

shall also be contained at this location for connectivity for Smart TV.

PART 2 – PRODUCTS

2.01 PRODUCTS

A. Teachers Desk shall be provided with Extron 70-726-63 wall plate with Extron #26-726-75 cable to Display location

B. TV Mount shall be Armstrong 64357, wall mount.

2.02 SPECIFIC SYSTEM INSTALLATION REQUIREMENTS

A. The entire system shall be installed in a workmanlike manner in accordance with approved manufacturers manuals and wiring diagrams. The contractor shall furnish all wiring, conduit, outlet boxes, junction boxes, terminal cabinets and similar devices necessary for the completed installation..

B. Installation off conduit, outlet boxes, junction boxes, terminal cabinets, special back boxes and similar devices shall comply with the requirements of Section 16010 Basic Electrical Materials.

C. All conduit, junction boxes, conduit supports and hangers shall be concealed in finished areas and may be exposed in unfinished areas.

D. All system devices shall be flush mounted when located in finished areas and may be surface mounted when located in unfinished areas. Verify with the Project Architect prior to any surface mounted installations.

E. All penetrations of floor slabs and firewalls shall be fire stopped in accordance with the electrical specifications.

2.03 SPECIFIC SYSTEM TESTING REQUIREMENTS

A. Contractor shall provide all required testing and certification at no cost to the Owner.

PART 3 - EXECUTION

3.01 GENERAL INSTALLATION REQUIREMENTS

A. The wiring of the system shall be executed in accordance with the drawings and the equipment manufacturer's wiring diagrams. Should any variations in these requirements occur, the contractor shall notify the architect before making any changes. It shall be the responsibility of the factory-authorized distributor of the approved equipment to install the equipment and guarantee the system to operate as per plans and specifications.

B. Furnish all conduit, junction boxes, conductors, equipment plugs, terminal strips, etc., and labor to install a complete and operable system.

C. The cables within racks or cabinets shall be carefully cabled and laced with no. 12 Cord waxed linen lacing twine or ty-raps. All cables shall be numbered for identification.

D. Splices of conductors in underground pull boxes are not permitted.

E. The labor employed by the contractor shall be regularly employed in the installation and repair of the specified systems and shall be acceptable to the owner and architect to engage in the installation and service of this system.

F. The contractor shall thoroughly clean all equipment and materials. All exposed parts of the equipment, cabinets, and other equipment shall be left in a clean condition, unblemished and free of all dirt, dust, smudges, spots, fingerprints, etc., The contractor shall remove all debris and rubbish occasioned by the electronic systems work from the site. The contractor shall thoroughly clean all buildings of any dirt, debris, rubbish, marks, etc., Caused by the performance of this work.

G. The system must meet all local and other prevailing codes.

H. All cabling installations shall be performed by qualified technicians.

I. All cabling shall be splice free.

J. In order to ensure proper terminations, it is required that all cables shall be stripped using a special tool approved by the manufacturer of the cable / terminating device.

K. The use of lubricants (i.e. Yellow 77) to facilitate the installation of cables in conduits is highly discouraged. If such a lubricant must be used, the contractor shall verify the acceptability of the lubricant to be used with the cable manufacturer, prior to using such a lubricant.

L. Under no circumstance are "channel locks" or other pliers to be used.

M. All firewalls penetrated by system cabling shall be sealed by use a non-permanent fire blanket or other method in compliance with the current edition of National Fire Protection Association (NFPA) and the National Electric Code (NEC) or other prevailing code. The contractor must not use concrete or other non-removable substance for fire stopping on cable trays, wire ways or conduits. Contractors who use this method will be required to replace all cables affected and provide the original specified access to each effected area.

3.02 GENERAL TESTING REQUIREMENTS

A. Provide all instruments for testing and demonstrating in the presence of the owner's inspector that the frequency response is as stated in the factory data sheets. Check all circuits and wiring to verify they are free of shorts and grounds.

B. System shall be complete and properly operating prior to calling for the test. The inspector, contractor and engineer shall walk test system at district's option and contractor shall make minor satisfactory adjustments to the system in the presence of the inspector. Contractor shall coordinate the time of test with the district inspector. This test shall be performed during a time when there are no other persons on the site.

3.03 FINAL ACCEPTANCE

A. The Owner or Owner's representative may visit the site during the installation of the system to ensure that correct installation practices are being followed.

B. The Owner or Owner's representative will conduct a final job review once the contractor has finished the job. This review will take place within one week after the contractor notifies the owner.

C. Two copies of all certification data and drawings for all identifications shall be provided to the Owner before the owner's review.

D. The Owner or Owner's representative will review the installation and certification data prior to the system acceptance.

E. The Owner or Owner's representative may test some of the systems features to ensure that the certification data is correct. If a substantial discrepancy is found, the Owner reserves the right to have an independent consultant perform a certification of the entire system. If such a procedure is undertaken, the cost of the testing will be billed back to the contractor.

F. In the event that repairs or adjustments are necessary, the contractor shall make these repairs at his own expense. All repairs shall be completed within 10 days from the time they are discovered.

G. The contractor shall provide not less than eight (4) hours for site instruction of personnel in the operation and maintenance of the installed systems. This instruction time shall be divided as directed by the Owner.

END OF SECTION

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SECTION 28 46 20 - FIRE ALARM

PART 1 - GENERAL

1.1 SCOPE

A. Work Included: All labor, materials, appliances, tools, equipment necessary for and incidental to performing all operations in connection with furnishing, delivery, and installation of the work of this Section, complete, as shown on the Drawings and/or specified herein. Work includes, but is not necessarily limited to the following:

1. Examine all other Specifications Sections and Drawings for related work required to be included as work under Division 26, 27 and 28.

2. General Provisions and Requirements for electrical work.

1.2 SUBMITTALS (ADDITIONAL REQUIREMENTS)

A. Submit the following to the Architect for Approval.

1. Manufacturers' catalog data for fire alarm components.

2. Installer qualifications.

1.3 APPLICABLE STANDARDS

The Equipment shall be listed, labeled, and approved for the application shown in Contract Documents, as fire alarm equipment complying with the Codes indicated on Plans.

1.4 EQUIPMENT AND INSTALLING QUALIFICATIONS

A. The Equipment shall be exclusively as manufactured by Farenhyt and System Sensor to match existing fire alarm equipment on campus. No equals will be allowed.

B. The Specification is based on the equipment of Manufacturers who have been approved by the District and the Manufacturers herein named shall be considered as meeting the Requirements of this Specification. For all items which are identified by part number and Manufacturer the Performance Specifications which are published in the most recent Manufacturer's data sheets available at the time of bidding this Project shall be applicable to the present work as though fully written out herein.

C. All equipment shall conform to all local applicable Codes and Ordinances and shall be listed by Underwriters Laboratories.

D. To qualify as an acceptable Bidder, whether the bid is submitted to the District, his Agent, a General Contractor or a Sub-Contractor, the System Bidder or Contractor shall be qualified Fire Alarm Contractor and shall hold a valid C10 License issued by the Contractors State License Board of California. The System Bidder or Contractor shall hereinafter be referred to as the Contractor. The Contractor shall hold all other licenses

required by the legally constituted Authorities Having Jurisdiction over the work. The Contractor shall be the Factory Authorized Distributor for the branch of equipment offered and shall have been engaged in the business of supplying and installing the specified type of system for at least 5-years. The Contractor shall maintain a fully equipped service organization capable of furnishing adequate repair service to the equipment. The Contractor shall be financially able to provide a performance bond covering the work and the guarantee described. The Contractor shall provide that bond if requested.

E. Installation Certification

1. Work and material for cables, cable terminations and related components shall be performed by Certified Installers. The Installer shall be certified by the respective Product Manufacturers.

2. The Manufacturers of the indicated work and material shall provide an Installer education/training and certification program for the supplied products.

3. The Installers performing the Contract Work for the indicated products shall have attended and successfully completed each of the respective Manufacturer's installation training education programs for the specified products.

4. Contract material installed, and work performed by Installers not complying with these Requirements shall be removed. Removal of work and material not in compliance with these Requirements shall done at the Contractors' expense, without any additional cost to the Contract and without any additional Contract completion due date extensions. New material and work required to replace the non-compiling removed work and material shall be provided at the Contractors' expense, without any additional cost to the Contract and without any additional Contract completion due date extensions.

PART 2 - PRODUCTS

2.1 GENERAL SYSTEM OPERATION

System shall be microprocessor-based, addressable, and power-limited with Class B super-vised circuits, one-way and two-way emergency audio communications.

2.2 AUTOMATIC ALARM INITIATING DEVICES

A. An electronic digital, multiplex, addressable module shall be incorporated into each device. The module shall communicate the status and trouble condition of each device with a unique address code. The module shall communicate with and be supervised and monitored by the fire alarm control panel.

B. Devices shall be suitable for use on a Class "B", 2-wire supervised alarm initiating circuit. Where initiating devices are shown connected to an existing system, devices shall operate on 2-wire or 4-wire circuits plus, 2-wire power circuit as required by the existing equipment.

C. Numbered screw type terminals shall be provided for "in-out" connectors of the alarm circuit wiring.

2.3 NOTIFICATION ALARM DEVICES

A. Notification alarm devices shall activate automatically from the control panel. Devices shall operate on a Class "B" (Style Y), 2-wire supervised alarm notification circuit.

B. Numbered screw type terminals shall be provided for "in-out" connections of the alarm circuit wiring.

PART 3 - EXECUTION

3.1 IDENTIFICATION

A. The inside cover of alarm initiating devices shall be marked with the zone initiating number corresponding to the zone number in the control panel. Marking shall be with a felt-tip pen.

B. Each fire alarm terminal cabinet shall be painted red.

3.2 WIRING

A. Review the total system point-to-point wiring layout to assure that the correct number and type of wires and conduit sizes are installed.

B. Final connections, testing, adjusting and calibration shall be made under the direct supervision of a Factory-Trained Technician of the System Supplier.

C. All wiring shall be in conduit.

D. All wiring in cabinets shall be neatly formed, laced, and made up on bolt and nut terminal blocks. Tag all spare conductors. All conductors shall terminate on terminal strips with spade lugs, of adequate size for all incoming and outgoing conductors. The strips shall be labeled as to their use and wiring diagram shall be placed on the cabinet door showing connections of all related equipment to these strips.

E. Wiring Requirements for shielding certain conductors shall be as recommended by the Manufacturer. Provide all conduit, raceways and conductors per Manufacturer’s recommendations and include all material and labor costs in the Contract price.

F. The conductors used for digital, multiplex communication between the fire alarm control panel and external remote initiation devices, control points and annunciators, shall be twisted, shielded, multi-conductor cable, #16AWG copper minimum with a separate internal ground/drain conductor, UL listed for fire alarm system use. One spare pair of multiplex conductors shall be provided in all main and branch device/equipment connections for future system use. "Tees" and taps at any junction

box location in the communication lines, shall be permitted by the system to additional devices without affecting proper system operation.

3.3 TESTING

A. The entire fire alarm system shall be tested in the presence of the local DSA Inspector and a Representative of the Manufacturer after the installation is complete.

1. Individually test each new automatic initiating device and verify correct alarm operation, control panel response and remote equipment operation.

2. The communication loops and the notification alarm circuits shall be opened in at least two locations per building to check for the presence of correct supervisory circuitry.

B. Test the battery back-up system by disconnecting the incoming normal power and allowing this alarm system to operate 24 hours on battery power. Sound the alarm system for 5-minutes at the end of 24 hours on battery power.

C. After the Testing has been completed to the satisfaction of CFC 907.9 – 907.9.4.1 the Inspectors, provide the NFPA Certificate of compliance to the District, the local Fire Official, the Architect and DSA.

D. Upon the receipt of Certificate of Compliance, the Installer/Supplier shall supply the District with a written operating, testing and maintenance instructions, Point-To-Point As-Built Drawings and Equipment Specifications. Maintenance provisions, CFC 907.4.5.

END OF SECTION 28 46 20
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SECTION 31 10 00 - SITE CLEARING

PART 1 - GENERAL

1.1 SUMMARY

A. Contractor shall furnish all labor, materials, services, testing, transportation and equipment necessary for the completion of all site clearing work as required and as indicated on drawings and specified herein. Work materials and equipment not indicated or specified which is necessary for the complete and proper operation of the work of this Section in accordance with the true intent and meaning of the contract documents shall be provided and incorporated at no additional cost to the Owner.

B. Removal of surface debris; removal of paving and curbs; removal of trees, shrubs, and other plant life; topsoil excavation; and repair of damaged vegetation and/or irrigation systems/system components.

C. Removal of concrete and bituminous surfacing.

1.2 RELATED SECTIONS

A. Section 01 71 23: Field Engineering.

B. Section 01 74 16: Temporary Storm Water Pollution Control Plan.

1.3 REFERENCE STANDARDS

A. The work provided herein shall conform to and be in accordance with the Contract Plans, General Conditions/Specifications and Special Provisions, as well as the Standard Specifications for Public Works Construction (“GREENBOOK”), 2021 Edition, adopted by the Southern California Chapter, American Public Works Association; herein referred to as the “Standard Specifications”.

1.4 REGULATORY REQUIREMENTS

A. The Contractor shall obtain all necessary permits, licenses, or agreements required by any legally constituted agency, pay for all fees and give all necessary notices required for the construction of the work. The Owner shall reimburse the contractor for all necessary permits or inspection fees by any legally constituted agency.

B. Perform all work of this Section in strict accordance with applicable Government Codes and Regulations especially meeting all safety standards and requirements of CAL/OSHA, County of Orange. Provide additional measures, added materials and devices as may be needed as directed by the Owner Representative at no added cost to the Owner.

C. Comply strictly to Rule 1404, South Coast Air Quality Management District.

D. Coordinate clearing Work with utility companies.

1.5 PROJECT CONDITIONS

A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.

1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.

2. Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.

B. Salvable Improvements: Carefully remove items indicated to be salvaged and store on Owner's premises where indicated.

C. Do not commence site clearing operations until temporary erosion and sedimentation control measures are in place.

D. Do not direct vehicle or equipment exhaust towards protection zones.

E. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones.

F. Soil Stripping, Handling, and Stockpiling: Perform only when the topsoil is dry or slightly moist.

PART 2 - PRODUCTS

2.1 Satisfactory Soil Materials: Excavated site soils, free of deleterious materials and rock particles larger than three (3) inches in the largest dimension, should be suitable for placement as compacted fill.

PART 3 - EXECUTION

3.1 PREPARATION

A. Verify that existing plant life designated to remain is tagged or identified.

B. Protect and maintain benchmarks and survey control points from disturbance during construction.

C. Identify a waste area for placing removed materials.

3.2 TEMPORARY EROSION AND SEDIMENTATION CONTROL

A. Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to erosion- and sedimentation-control Drawings and requirements of authorities having jurisdiction.

B. Retain first paragraph below if tree- or plant-protection zones are required.

C. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross protection zones.

D. Inspect, maintain, and repair erosion- and sedimentation-control measures during construction until permanent vegetation has been established.

E. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.3 PROTECTION

A. Protect existing structures and site improvements indicated to remain from damage by approved methods and/or as authorized by the Owner Representative. Removal of all protections shall be when work of this Section is completed or when so authorized by the Owner Representative.

B. Protect Existing Utilities indicated or made known to remain traversing the job-site and serving existing adjacent facilities.

C. Protect Existing Trees and Shrubs indicated to remain by providing temporary surrounding fencing so located a sufficient distance away so that trees and shrubs will not be damaged by site-clearing operations.

1. Protection Barrier: A protection barrier shall be installed around the shrubs or trees to be preserved. The barrier shall be constructed of a durable fencing material, such as plastic construction fencing, snow fence, or chain link. The barrier shall be placed at or beyond the drip line. "Drip line" as referred to herein means a line which may be drawn on the ground around the tree directly under its outermost branch tips and which identifies that location where rainwater tends to drip from the tree. Placement of barrier to be approved by Owner Representative (Grounds Supervisor). If barrier is placed inside the drip line, then 3/4 inch plywood must be placed over the root zone up to the drip line. The fencing shall be maintained in good repair throughout the duration of the project, and shall not be removed, relocated, or encroached upon without permission of the Owner Representative (Grounds Supervisor).

2. Storage of Materials: There shall be NO storage of materials or supplies of any kind within the area of the protection barriers. Concrete, cement, asphalt

materials, block, stone, sand and soil shall not be placed within the drip line of the tree(s).

3. Fuel Storage: Fuel storage shall NOT be permitted within 150 feet of any tree to be preserved. Refueling, servicing and maintenance of equipment and machinery shall NOT be permitted within 150 feet of protected trees.

4. Vehicles/equipment: NO parking or driving of vehicles or storage of equipment shall be permitted within the drip line of any tree to be preserved.

5. Debris and Waste Materials: Debris and waste from construction or other activities shall NOT be permitted within protected areas. Wash down of Concrete, cement or asphalt handling equipment, in particular shall NOT be permitted within 150 feet of protected areas.

6. Grade Changes: Grade changes can be particularly damaging to trees. Any grade changes should be approved by the Owner Representative (Grounds Supervisor) before construction begins and precautions taken to mitigate potential injuries.

7. Damages: Any damages or injuries to the preserved trees (including pruning or cutting of such trees not in conformity with the International Society of Arboricultural Pruning Guidelines and ANSI A300 Pruning Standards) shall be reported immediately to the Owner Representative (Grounds Supervisor). Severed roots shall be pruned cleanly to healthy tissue, using proper pruning tools. Broken branches/limbs shall be pruned according to International Society of Arboricultural Pruning Guidelines and ANSI A300 Pruning Standards. In the event that any damage, injury, improper pruning or cutting of a protected tree is deemed to be so substantial as to require its replacement (such determination to be made in the sole discretion of the Owner Representative), Contractor shall replace such tree with the same species and variety of tree, up to a box size of 48 inches, or if no such replacement is available, with a substitute species or variety as determined in the sole discretion of the Owner Representative. Any replacement tree shall be approved in advance by the Owner Representative. The value of the tree to be replaced shall be determined by a Certified Arborist selected by Contractor from the Owner's approved list of Registered Consulting Arborists. To the extent that the value of the replaced tree as determined by the Certified Arborist exceeds the cost of the replacement tree, Contractor shall be liable to Owner for such difference in value in addition to all costs associated with replacement of the damaged tree.

8. Removal of Existing Tree or Shrub: Prior to removing or cutting any trees designated for removal, the contractor shall coordinate with the Owner's Ground Supervisor. In the event that Contractor, a Subcontractor, Sub-Subcontractor, material supplier or anyone else performing the Work of the Contract willfully, negligently or mistakenly removes any tree or shrub not designated for removal, Contractor shall immediately report such removal to the Owner Representative (Grounds Supervisor). Contractor shall replace such tree with the same species and variety of tree, up to a box size of 48 inches, or if

no such replacement is available, with a substitute species or variety as determined in the sole discretion of the Owner Representative. Any replacement tree shall be approved in advance by the Owner Representative. The value of the tree to be replaced shall be determined by a Certified Arborist selected by Contractor from the Owner's approved list of Registered Consulting Arborists. To the extent that the value of the replaced tree as determined by the Certified Arborist exceeds the cost of the replacement tree, Contractor shall be liable to Owner for such difference in value in addition to all costs associated with replacement of the damaged tree.

9. Unauthorized Tree Removal or Injury: Criminal Penalties: Reference is made to California Penal Code §384a which provides that any person who willfully or negligently cuts, destroys, mutilates or removes any tree or shrub or portion thereof growing on public land without a written permit from the owner of said public land is guilty of a misdemeanor, subject to a fine of up to $1,000, imprisonment in county jail for up to 6 months, or both. Contractor is advised that, in addition to all remedies provided herein and in the Contract Documents, the Owner shall cooperate with appropriate authorities in prosecuting and enforcing Penal Code §384a and other criminal sanctions as appropriate concerning trees and shrubs located on Owner property.

10. Preventive Measures: Before construction begins fertilization of the affected areas to be applied at a rate to be determined by the Owner Representative (Grounds Supervisor).

D. Protect bench marks, survey control points, and existing structures from damage or displacement.

E. Protection of Persons and Property (existing structures and site improvements):

1. Provide barricades, warning signs at open depressions and holes on adjacent property and public accesses.

2. Provide operating warning lights during hours from dusk to dawn each day or as otherwise required.

3. Protect existing remaining structures, utilities, sidewalks, pavements other facilities from damage as caused by settlement, undermining, washout or other hazards created by site-clearing operations of this Section.

F. Use means necessary to prevent dust from becoming a nuisance to the public, to neighbors and to others performing work on or near the job-site.

G. Maintain access to the job-site at all times.

3.4 CLEARING AND GRUBBING

A. Clear areas required for access to site and execution of Work.

B. Remove all rubbish and debris existing and resulting from work operations of this Section as soon as possible, do not allow to pile up. Do not burn rubbish and debris on the job-site.

C. Where active utility lines need to be capped or plugged, perform such work in accordance with requirements of the Utility Company.

3.5 REMOVAL

A. Remove debris, rock, and extracted plant life from site.

B. Excavate and remove associated plumbing piping.

C. Prior to demolition work, the Contractor shall notify the Owner Representative to identify the existing items for salvage purposes. The materials identified for salvage shall be returned to the Owner in a timely manner agreed upon by the Owner Representative.

3.6 CONCRETE AND BITUMINOUS SURFACE REMOVAL

A. Where noted on the construction drawings, break up and completely remove all existing concrete surfacing, curbs, gutters, walks and bituminous surfacing to limits indicated to be removed. All cutting shall be done to a neat and even line with proper tools or a concrete cutting saw. Minimum depth of cut shall be 1-1/2”, unless otherwise specified. Remove any concrete broken beyond the indicated limits to the nearest joint or score line and replace with new concrete to match the existing.

B. Removed concrete and bituminous materials shall be disposed of off-site unless otherwise noted on the construction drawings. All such items to be removed shall be disposed of off the property in a legal manner.

C. Bituminous pavement saw cutting shall conform to the provisions of Section 300-1.3.2 (a) of the Standard Specifications. The residue resulting from the saw cutting operations shall not be permitted to flow beyond the specific work location and shall be removed the same day.

D. Removal of concrete curb / curb & gutter covered by this section shall include saw-cutting and removal of a twelve (12") inch wide section of the adjacent bituminous pavement.

E. When saw cutting concrete curb / curb & gutter, the cuttings shall be continuously wet vacuumed to prevent the materials from entering catch basins, storm water conveyances, or waters of the State. Vacuumed cuttings shall be disposed of according to applicable regulations.

F. Concrete curb and concrete curb and gutter shall be removed to the lines, grades and locations shown on the plans in accordance with Section 300-1.3.2 of the Standard Specifications.

G. Concrete removal in sidewalk and driveway areas shall extend to existing score lines unless specifically indicated otherwise on the Plans or in the Project Special Provisions, or unless otherwise approved by the Engineer.

H. Reinforcing or other steel may be encountered in portions of concrete to be removed. No additional compensation will be allowed for the removal of concrete containing reinforcing or other steel.

I. In those areas where existing bituminous surfacing is removed to make way for new planting or lawn areas, remove soil 6" below existing exposed soil surface. Removed soil may be used only as fill under buildings or other areas to be paved, only if approved by the Owner Inspector. Legally dispose of off site, if material is not approved as fill material.

3.7 REPAIRS

A. During demolition and construction, ensure that trees, shrubs and other plant material and vegetation are protected inside and outside of the work zone and that the vegetation is being watered, maintaining the proper moisture content according to the season. Failed vegetation, including sod, due to lack of water, and/or plant material destroyed during construction period are to be replaced to equal or better size and condition at no additional cost to the Owner.

B. If the irrigation system is damaged or modified during construction, it shall be repaired to the Owners standards, and shall be in equal or better condition than prior to damage or modification. All repairs shall be, inspected and approved by the Owner Representative (Grounds Supervisor) prior to backfilling or covering of said repairs. The Owner representative requires forty-eight hours prior notice, when contractor requests inspection of completed repairs. All repairs shall be made so as to ensure proper operation prior to the close of the contract at no additional cost to the Owner.

C. Controller Wires: If damaged, cut or removed, repair by splicing, soldering and silicone sealing. To ensure proper operation, reconnect the wires to the valve to correspond with the map on the controller to the correct station.

D. Hydraulic Tubes: If damaged/cut or removed, repair by replacing the tubing using equal or better material.

E. Valves: If damaged, repair/replace with equal or better material. All valves are to be flushed/cleaned thoroughly.

F. Mainlines: If damaged, repair/replace with equal or better material. All lines are to be flushed/cleaned thoroughly.

G. Lateral Lines: If damaged, repair/replace with equal or better material. All lines are to be flushed/cleaned thoroughly.

H. Irrigation Heads: If damaged, repair/replace with equal or better material. All heads are to be flushed and filters cleaned thoroughly.

I. Controllers: If damaged repair/replace with equal or better material.

J. Backflow Prevention Devices: If damaged, repair/replace with equal or better material.

K. Gate/Ball/Quick Coupler Valves: If damaged repair/replace with equal or better material.

L. Valve Boxes: If damaged, repair/replace with equal or better material. Concrete boxes and concrete lids with the appropriate markings for identification shall be used. The top of the box shall be buried below finish grade, equal to existing depth or deeper. The top of the valve stems shall be 6" below the underside of the top of the box.

M. Construction in grass areas: Sod shall be removed by sod cutting at a soil depth of 2", stored on site, and watered on a daily basis. Upon completion of work, stored sod shall be reinstalled over the areas disrupted due to construction. An option may be to bypass cutting the sod, however at the completion of the project, finish grading and installation of new Hybrid Bermuda GN -1 sod over the areas disrupted by construction shall be required.

3.8 EXCESS MATERIALS DISPOSAL

A. Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials, including trash and debris, and legally dispose of them off Owner's property.

B. Separate recyclable materials produced during site clearing from other non-recyclable materials. Store or stockpile without intermixing with other materials and transport them to recycling facilities. Do not interfere with other Project work.

3.9 SITE CLEANUP

A. Cleanup of branches limbs, logs, or any other debris resulting from any operations shall be promptly and properly accomplished. The work area shall be kept safe at all times until all operations are completed. Under no circumstances shall the accumulation of brush, limbs, logs, or other debris be allowed in such a manner as to result in a hazard to the public. All debris shall be cleaned up each day before the work clew leaves the site, unless permission is given by the Owner to do otherwise. All lawn areas shall be raked, all streets and sidewalks shall be swept, and all brush, branches, rocks or other debris shall be removed from the site. Areas are to be left in a condition equal to or better than that which existed prior to the commencement of operations.

END OF SECTION 31 10 00

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SECTION 31 20 00 - EARTHWORK

PART 1 - GENERAL

1.01 SUMMARY

A. The work of this section shall include excavation, unclassified cut, unclassified fill, removing existing unsatisfactory material, preparing areas to be filled, spreading and compacting of fill in the areas to be filled, and all other work necessary to complete the grading of the site. It shall be the Contractor's responsibility to place, spread, moisten or dry, and compact the fill in strict accordance with these specifications to the lines and grades indicated on project plans or as directed in writing by the Geotechnical Engineer. Included with this Work are the following:

1. Excavating, filling, backfilling, and compacting for Project site pavement, planting areas, buildings, and other structures.

2. Excavating and backfilling trenches.

3. Shoring plan guidelines.

1.02 DEFINITIONS

A. Excavation consists of the removal of material encountered to subgrade elevations and the reuse or disposal of materials removed.

B. Subgrade: The uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, drainage fill, or topsoil materials.

C. Borrow: Soil material obtained off site when sufficient approved soil material is not available from excavations.

D. Base Course: The layer placed between the subgrade and surface pavement in a paving system.

E. Drainage Fill: Course of washed granular material supporting slab on grade placed to cut off upward capillary flow of pore water.

F. Permeable Backfill: Provide permeable backfill material behind retaining structures consisting of gravel, crushed gravel, crushed rock, natural sands, manufactured sand, or combinations.

G. Unauthorized excavation consists of removing materials beyond indicated subgrade elevations or dimensions without direction by the Architect. Unauthorized excavation, as well as remedial work directed by the Architect, shall be at the Contractor's expense.

H. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man made stationary features constructed above or below ground surface.

I. Utilities include underground pipes, conduits, ducts, and cables, as well as underground services within building lines.

1.03 SUBMITTALS TO CONSTRUCTION MANAGER

A. General: Submit the following according to the Conditions of the Contract and Division 1 Specification Sections.

B. Product data for the following:

1. Each type of plastic warning tape.

C. Test Reports: In addition to test reports required under field quality control, submit the following:

1. Laboratory analysis of each soil material proposed for fill or backfill from borrow sources.

D. Excavation support & protection (shoring) shop drawings for informational purposes: Prepared by or under the supervision of a qualified professional engineer for excavation support and protection systems.

1.04 QUALITY ASSURANCE

A. Codes and Standards:

1. 2019 California Building Code, Title 24, Part 2, Volume 2 of 2, Appendix J, Grading.

2. ASTM D422 - Method for Particle Size Analysis of Soils

3. ASTM D1556 - Test Method for Density of Soil in Place by the Sand-Cone Method.

4. ASTM D1557 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10-lb (4.54 kg) and 18-inch (457-mm) Drop.

5. ASTM D2216 - Method for Laboratory Determination of Water (Moisture) Content of Soil, Rock, and Soil Aggregate Mixtures.

6. ASTM D2922 - Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depths).

7. ASTM D3017 - Test Method for Moisture Content of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depths).

8. ASTM D4318 - Test Method for Liquid Limit, Plastic Limit and Plasticity Index of Soils.

9. AASHTO T217 - Determination of Moisture in Soils by Means of a Calcium Carbide Gas Pressure Meter.

10. ASTM D4829 - Expansion Index Test.

B. Conditions/Specifications and Special Provisions, as well as the Standard Specifications for Public Works Construction (“GREENBOOK”), 2021 Edition, adopted by the Southern California Chapter, American Public Works Association; herein referred to as the “Standard Specifications”.

C. Comply with all requirements of permit for export of soil from site. Permit is to be obtained and paid for by Contractor. Furnish copies of all permits and licenses required by the City or County to Owner's representative.

D. Professional Observation: A soils engineer will be retained by the Owner for purposes of inspection, testing and approval of all work under this section. Perform work of this Section under inspection and approval of the soils engineer. Give soils engineer not less than 48 hours advance notice of readiness for inspection.

E. The soils engineer will have the authority over all filling, grading, and compaction operations, including interruption of work if deemed necessary due to improper work

F. Pre-Grading Conference: Conduct conference at Project site to comply with requirements of Division 1 Section "Project Meetings."

1. Before commencing earthwork operations, meet with representatives of the governing authorities, Owner, Architect, consultants, Geotechnical Engineer, independent testing agency, and other concerned entities. Review earthwork procedures and responsibilities including testing and inspection procedures and requirements. Notify participants at least 3 working days prior to convening conference. Record discussions and agreements and furnish a copy to each participant.

1.05 CONSTRUCTION MONITORING

A. All earthwork and foundation construction should be monitored by a qualified engineer/technician under the supervision of a Geotechnical Engineer, including;

1. Observation of all site preparations;

2. Observation of shoring installation, if needed:

3. Observation of all site excavations;

4. Test and approval of all import soil;

5. Observation of placement of all compacted fills and backfills;

6. Observation of all surface and subsurface drainage systems;

7. Observation of all foundation and pile excavations;

8. Observation of subgrade preparation for paved and building areas.

B. The Geotechnical Engineer of Record should be notified at least three (3) days in advance of the start of construction. A joint meeting between the Contractor and Geotechnical Engineer is recommended prior to the start of construction to discuss specific procedures and scheduling. The Geotechnical Engineer should be present to observe the soil conditions encountered during construction, to evaluate the applicability of the recommendations presented in the Soils Report to the soil conditions encountered, and to recommend appropriate changes in design or construction if conditions differ from those described herein. The Geotechnical Engineer of Record should inspect and approval all imported backfill material prior to its placement as backfill, approve the subgrade beneath all fills, fill placement and bottom of all foundation excavations before concrete or steel is placed.

C. The Geotechnical Engineer shall submit compaction reports to the Construction Manager and the Civil Engineer at the completion of the work, including test results and plot plans indicating the locations from which the tested samples of fill were taken. The Geotechnical Engineer shall keep the Construction Manager informed on the progress of the grading work.

1.06 IMPORT AND EXPORT OF EARTH MATERIALS

A. Fees: Pay as required by government authority having jurisdiction over the area.

B. Bonds: Post as required by government authority having jurisdiction over the area.

C. Hauling Routes and Restrictions: Comply with requirements of authorities having jurisdiction over the area.

1.07 DIG ALERT NOTIFICATION

A. Before any excavation in or near the public right-of-way, the Contractor must contact the Underground Service Alert of Southern California (Dig Alert) at **811** for information on buried utilities and pipelines.

B. Delineation of the proposed excavation site is mandatory. Mark the area to be excavated with water soluble or chalk based white paint on paved surfaces or with other suitable markings such as flags or stakes on unpaved areas.

C. Call at least Two (2) full working days prior to digging.

D. If the members (utility companies) have facilities within the work area, they will mark them prior to the start of your excavation and if not, they will let you know there is no conflict. A different color is used for each utility type (electricity is marked in red, gas in yellow, water in blue, sewer in green, telephone and cable TV in orange).

E. The Law requires you to hand expose to the point of no conflict 24" (inches) on either side of the underground facility, so you know its exact location before using power equipment.

F. If caught digging without a Dig Alert ticket you can be fined as much as $50,000 per California government code 4216.

1.08 SUBSURFACE CONDITIONS

A. Where investigations of subsurface conditions have been made by the Owner with respect to subsurface conditions, utilities, foundation, or other structural designs, and that information is shown in the Plans, it represents only a statement by the Owner as to the character of materials which have actually been encountered by the Owner’s investigation. This information is only included for the convenience of Bidders.

B. Investigations of subsurface conditions are made for the purpose of design only. The Owner assumes no responsibility with respect to the sufficiency or accuracy of borings or of the log of test borings or other preliminary investigations or of the interpretation thereof. There is no guaranty, either expressed or implied, that the conditions indicated are representative of those existing throughout the Work, or any part of it, or that unanticipated conditions may not occur. When a log of test borings is included in the Plans, it is expressly understood and agreed that said log of test borings does not constitute a part of the Contract. The log of test borings represents only an opinion of the Owner as to the character of the materials to be encountered, and is included in the Plans only for the convenience of the Bidders. Making information available to Bidders is not to be construed in any way as a waiver of the provisions of the first paragraph of this Section, and Bidders must satisfy themselves through their own investigations as to conditions to be encountered

1.09 PROJECT CONDITIONS

A. Contractor shall determine existing conditions under which the Contractor will operate in performing the Work.

B. Information on Drawings does not constitute a guarantee of accuracy or uniformity of soil conditions over the Project site.

C. Existing utilities: Locate existing underground utilities in all areas of work prior to excavation or commencement of work. If utilities are to remain in place provide adequate means of protection during earthwork operations.

1. Should uncharted, or incorrectly charted piping or other utilities be encountered during excavation, consult Utility Owner immediately for direction. Cooperate with Owner and Utility companies in keeping respective services and facilities in operation. Repair damaged utilities to the satisfaction of Utility Company.

2. Do not interrupt existing utilities serving facilities occupied or used by Owner, or others, except when permitted in writing by Owner's Representative, and then only after acceptable temporary services have been provided.

3. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies for shut off of services if lines are active.

D. Noise and Dust Abatement: Exercise all reasonable and necessary means to abate dust, dirt rising and undue noise. Perform necessary sprinkling and wetting of construction site to allay dust as required by applicable codes and ordinances.

E. Water for Construction: Contractor shall obtain and pay for all water required for his work. This may include, but is not limited to, payment of deposits to utility for construction meter, and payment of all monthly service and water charges. Construction meter shall be in place throughout construction period unless alternative arrangements are made with the local water purveyor to provide construction water for all purposes. Contractor shall be aware of water moratoriums and restrictions, and shall immediately advise Owner of effects on construction schedules.

F. Existing Conditions: Prior to commencing work at site, verify agreement of existing conditions with indicated conditions. Notify Owner's Representative in writing of discrepancies found. Start of work without notification constitutes acceptance of conditions, without cause for extra compensation.

PART 2 - PRODUCTS

2.01 SOIL MATERIALS

A. General: All soils materials to be used throughout the site shall be approved for use by the Geotechnical testing engineer. Provide approved borrow soil materials from off-site when sufficient approved soil materials are not available from excavations.

B. No earthwork analysis has been completed with respect to the volumes of soils to be excavated, placed, or imported in order to provide the finished grades

shown on the plans. The Contractor is solely responsible for verifying the earthwork quantities necessary to complete the project.

C. Satisfactory Soil Materials: Soils approved by the testing geotechnical engineer and free of rock or gravel larger than 4 inches in any dimension, debris, waste, vegetation and other deleterious matter and as approved by the Geotechnical Engineer. Rocks or hard lumps larger then approximately 4 inches in diameter should be broken into smaller pieces or should be removed from the site. It is anticipated that most of the on-site soils may be reusable as engineered fill after any vegetation, construction debris, oversized material and deleterious material is removed from the site. On-site soils shall be adequately moisture conditioned to permit achieving the required compaction.

D. Borrow / Imported Fill Material: Soil excavated from site or imported conforming to requirements for fill material.

1. Import fill should be inorganic, granular, nonexpansive soil free from rocks or lumps greater than 8 inches in maximum dimension, and should exhibit a very low expansion potential (expansion index less than 21), negligible sulfate content (less than 1,000 ppm soluble sulfate by dry weight of soil), and low corrosion potential.

2. Proposed import should be sampled at the source and tested by the geotechnical firm for expansion index, soluble sulfate content, and corrosion potential.

E. Base Course Material For Use Under Pavement: Crushed base material shall consist of materials that meet the provisions listed below.

1. Crushed Aggregate Base (CAB) per Section 200-2.2, 3/4” maximum of the Standard Specifications for Public Works Construction (Green Book).

2. Crushed aggregate base (CAB) shall consist of native rock without naturally occurring asbestos or recycled materials. The Contractor shall submit written documentation, which identifies the source, volume, and proposed transport date of the material for review and approval by the Owner’s Construction Manager prior to importing the material. A statement on company letterhead from the source, stamped by either a California Professional Geologist or Engineer, which states that the subject materials are native rock, do not contain any recycled materials and that the source does not mine ultramafic materials, a source of natural occurring asbestos shall be included in the submittal to Owner’s Construction Manager.

3. Crushed Miscellaneous Base (CMB) per Section 200-2.4, fine sieve, of the Standard Specifications for Public Works Construction (Green Book).

F. Engineered Fill: Site soils and/or import materials approved for use as fill should be placed in loose horizontal lifts not exceeding 8 inches, moisture conditioned

to a minimum of one (1) percentage point above optimum moisture content per ASTM D1557-12 Test Method, unless otherwise stated.

G. Bedding Material for Trenches:

1. Bedding sand shall be as defined by Standard Specifications, Section 200-1.5, and shall be free of expansive material and organic matter. On-site soils are not considered suitable for bedding of utilities.

2. Sand providing a sand equivalent of at least 30. All of the sand bedding shall be compacted to a minimum 90 percent of maximum density as indicated in the Contract Documents by mechanical means. Flooding and jetting shall not be permitted without prior written approval from the Geotechnical Engineer. Where sheeting or shoring is used densification of the bedding shall be accomplished after the sheeting or shoring has been removed from the bedding zone, unless the sheeting or shoring is to be cut off or left in place. Pipe bedding material shall be placed in horizontal layers not exceeding (8) eight inches.

H. Backfill Material for Trenches:

1. The on-site soils have been determined to be suitable for being used for backfilling purposes in trenches. Utility trenches should be backfilled with granular materials and mechanically compacted to at least 90% of the maximum dry density of the soils.

I. Filter Fabric: Manufacturer's standard nonwoven geotextile fabric of polypropylene geotextiles, “Mirafi 140N” or approved equal.

2.02 ACCESSORIES

A. Detectable Warning Tape: Acid and alkali-resistant polyethylene film metallic warning tape manufactured for marking and identifying underground utilities, 6 inches wide and 4 mils thick minimum, continuously inscribed with a description of the utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches deep.

1. Tape Colors: Provide tape colors to utilities as follows:

a. Red: Electric & Fire Water.

b. Yellow: Gas, oil, steam, and dangerous materials.

c. Orange: Telephone and other communications.

d. Blue: Water systems, with “Caution: Water Line Below.”

e. Green: Sewer systems, with “Caution: Sewer Line Below.”

f. Green: Storm systems, with “Caution; Storm Drain Line Below.”

2.03 EXCAVATION SUPPORT & PROTECTION – SHORING PLAN

A. The CONTRACTOR shall have at the Worksite, copies or suitable extracts of: Construction Safety Orders, Tunnel Safety Orders and General Industry Safety Orders issued by the State Division of Industrial Safety. The CONTRACTOR shall comply with provisions of these and all other applicable laws, ordinances, and regulations.

B. Before excavating any trench 5 feet or more in depth, the CONTRACTOR shall submit a detailed plan to the Owner showing the design of shoring, bracing, sloping, or other revisions to be made for the Workers' protection from the hazard of caving ground during the excavation of such trench. If the plan varies from the shoring system standards, the plan shall be prepared by a registered Civil Engineer. No excavation shall start until the DISTRICT has accepted the plan and the CONTRACTOR has obtained a permit from the State Division of Industrial Safety. A copy of the permit shall be submitted to the DISTRICT.

C. The INSPECTOR will provide a competent person trench/excavation certification form to the CONTRACTOR. It shall be completely filled out before any worker has access to trench or excavation and returned to the INSPECTOR before the end of the first working day. The CONTRACTOR shall certify by this form the name of the competent person administering the Work, the soil classification, and the type of excavation protective system provided and/or installed.

D. The CONTRACTOR shall completely fence all excavations to provided protection against anyone falling into the excavation and to the satisfaction of the INSPECTOR. The fencing shall be in place at all times except when workers are present and actual construction operations are in progress.

E. The fencing material shall be chain link fabric or welded wire fabric and 6 feet high, constructed according to one of the following:

1. Tensioned fencing material and have top and bottom tension wires securely fastened to driven steel posts or other equally rigid elements at a maximum spacing of 12 feet; or

2. Untensioned fencing materials securely fastened to extended trench shoring elements at a maximum spacing of 8 feet and fastened to continuous top and bottom rails constructed of nominal 2 in x 4 in lumber or equally rigid material. Framed panels with suitable supporting elements fastened together to form a continuous fence may also be used.

F. Payment for performing all work necessary to provide safety measures shall be included in the prices bid for other items of work except where separate bid items for excavation safety are provided, or required by law.

PART 3 - EXECUTION

3.01 PREPARATION

A. Protect adjacent property and existing improvements and structures as necessary to prevent undermining, caving of cuts, and miscellaneous damage.

B. Provide cribbing, sheeting, and shoring necessary to safely retain the earth banks and protect excavations and adjoining grades from caving and other damage resulting from excavating together with suitable forms of protection against bodily injury to personnel employed on the work and the general public. Be responsible for the design, installation, and maintenance of required cribbing and shoring and shall meet the approval of the State Division of Industrial Safety and local governing agencies requirements.

C. Utility lines and structures shown shall be protected and treated as indicated. Where work not shown is encountered, report it to the Architect before proceeding with excavation. Encase active lines in sleeves where they pass through concrete; remove inactive lines as directed, and plug the remaining ends. Bear the costs for repairs to damaged or broken utilities and any damages related thereto.

D. Protect existing improvements and adjacent properties from storm damage and flood hazard originating on this project until final acceptance by the Owner. Prevent silt run-off from the limits of work in accordance with governmental requirements.

E. A minimum 6-foot high, temporary chain link fence and gates, (pair 26' wide, minimum) shall be erected prior to any operations at the construction limits perimeter. Coordinate the exact location with Architect and Inspector.

3.02 DEWATERING

A. Prevent surface water and subsurface or ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area. Any water entering an excavation shall be immediately pumped out and the exposed excavation allowed to dry.

B. Protect subgrades and foundation soils from softening and damage by rain or water accumulation.

3.03 GRADE STAKES

A. The Contractor’s Surveyor will set grade stakes. The Surveyor shall be a California registered land surveyor or licensed Civil Engineer. The Surveyor shall be hired and paid by the Contractor, and shall be subject to the approval of the District. Contractor shall notify the District at least 48 hours before staking is to be started. The District will determine if work is ready for staking.

B. All work shall conform to the lines, elevations, and grades shown on the Construction Plans. Three consecutive points set on the same slope shall be used together so that any variation from a straight grade can be detected. Any

such variation shall be reported to the Engineer. In the absence of such report, the Contractor shall be responsible for any error in the grade of the finished work.

C. Protect and maintain stakes in place until their removal is approved by the District. Grade or location stakes lost or disturbed by Contractor, shall be reset by the Surveyor at the expense of Contractor.

D. Grades for underground conduits will be set at the surface of the ground. The Contractor shall transfer them to the bottom of the trench.

3.04 EXCAVATION

A. Unclassified Excavations: Comply with the Standard Specifications for Public Works Construction, Section 300: "Earthwork", except as modified herein.

B. In preparation for grading, the construction areas should be cleared of surface vegetation, concrete, pavement and any loose surficial soils. Any unsuitable material encountered should be properly disposed of and not incorporated into any new fill.

C. Excavate to the depths, lines and grades indicated on the approved Grading Plan. Excavate sufficiently over-size to permit installation and removal of concrete forms and other required work. Should soil of inadequate density and bearing capability be encountered at the elevations indicated on the drawings, or where new fill is to be placed upon existing loose fill material exposed by excavation, the excavation shall be carried to the depth required to attain soil of bearing quality as determined by the Geotechnical Engineer.

D. A California Licensed Surveyor (LS) must provide grade stakes and elevations for the Geotechnical Engineer to verify that the over-excavation depths, shown on the construction drawings for asphalt concrete pavement and concrete pavement structural sections, have been achieved prior to re-compaction.

E. Cut banks shall be neatly trimmed to the required finish surface as the cut progresses, or the Contractor shall have the option of leaving the cuts full and finish grading by mechanical equipment which shall produce the finish surfaces as shown on the Drawings.

F. Surplus earth not needed for filling and grading shall be disposed of in a legal manner off the site.

G. All applicable requirements of the California Construction and General Industry Safety Orders, the Occupational Safety and Health Act of 1970, and the Construction Safety Act should also be followed.

H. Bills of lading or equivalent documentation will be submitted to the IOR on a daily basis.

I. Upon completion of import operations, provide the OAR a certification statement attesting that all imported material has been obtained from the identified source site.

3.05 HAZARDOUS MATERIALS

A. All import fill material shall be characterized, handled, and documented in accordance with applicable US EPA and State of California hazardous waste and hazardous materials regulations.

B. “Contaminated” shall mean any soil or geotechnical material at a concentration, which would require disposal at a regulated facility (i.e., California hazardous or RCRA hazardous).

C. Owner’s Authorized Representative (OAR) must be notified at least 72 hours prior to the disposal of any hazardous waste or hazardous material. No material disposal or reuse can take place without prior written approval of the OAR.

3.06 EXCAVATION, BACKFILL & COMPACTION FOR UTILITIES

A. Field conditions may require deviations from information indicated on Drawings. Such changes in work shall be covered by a Change Order, indicating an increase or decrease in the Contract sum.

B. Before excavation, Contractor shall contact the "Underground Service Alert of Southern California" (USASC) for information on buried utilities and pipelines.

C. When connections are to be made to any existing pipe, conduit, or other appurtenances, the actual elevation or position of which cannot be determined without excavation, the Contractor shall excavate for, and expose, the existing improvement before laying any pipe or conduit. The Engineer shall be given the opportunity to inspect the existing pipe or conduit before connection is made. Any adjustments in line or grade which may be necessary to accomplish the intent of the plans will be made, and the Contractor will be paid for any additional work resulting from such change in line or grade.

D. Trenches, ditches, pits, sumps, and similar items which are outside the barricaded working area shall be barricaded to conform to Cal OSHA standards.

E. Trenches over 5'-0" in depth shall conform to the Construction Safety Orders of the California Division of Industrial Safety, see Section 2.3 EXCAVATION SUPPORT & PROTECTION – SHORING PLAN.

F. Safe and suitable ladders which project 2 feet above the top of the trench shall be provided for all trenches over 4 feet in depth. One ladder shall be provided for each 50 feet of open trench, or fraction thereof, and be so located that workers in the trench need not move more than 25 feet to a ladder.

G. Where indicated and/or required to excavate in lawn areas, protect adjoining lawn areas outside of the Work area. Replace or install removed sod upon

completion of backfill by installing sod level with adjacent lawns. If installation of removed sod fails, furnish sod and install to match existing lawns.

H. All trenches should be backfilled with approved fill material compacted to relative compaction of not less than 90 percent of maximum density determined in accordance with ASTM D 1557. Backfill shall be placed in layers not exceeding 8” (inches) in thickness.

I. Backfill over excavations to the required elevations with earth, gravel, sand, or concrete and compact as required. Provide excavations free from standing water by pumping, draining, or providing protection against water intrusion. Slope adjacent grades away from excavations to minimize entry of water.

J. Do not excavate trenches parallel to footings closer than 18" from the face of the footing or below a plane having a downward slope of 2 horizontal to one vertical, from a line 9" above bottom of footings.

K. If soft, spongy, unstable, or other unsuitable material is encountered upon which the bedding material or pipe is to be placed, this material shall be removed to a depth ordered by the Engineer and replaced with bedding material suitably densified. Additional bedding so ordered, over the amount required by the Plans or Specifications, will be paid for as provided in the Bid. If the necessity for such additional bedding material has been caused by an act of failure on the part of the Contractor or is required for control of groundwater, the Contractor shall bear the expense of the additional excavation and bedding.

L. Unless indicated otherwise on the plans are within this specification, excavate trenches to the required depths for utilities, such as pipes, conduit and tanks, with minimum allowances of 6 inches at the bottom and 6 inches at the sides for bedding of unprotected piping or as required for concrete encasement of conduits as indicated on Drawings. Maximum allowances at the sides for trenching shall be 12 inches. Grade bottom of trenches to a uniform smooth surface. Remove loose soil from the excavation before installing sand bedding or concrete encasement.

M. Where portions of existing structures, walks, paving, etc. must be removed or cut for pipe or conduit installation, replace the material with equal quality, finished to match adjacent work.

N. Provide a minimum clear dimension of 6 inches from sides of wall excavation to outer surfaces of buried pipes or conduits installed in the same trench or outside surfaces of containers and/or tanks.

O. **DO NOT** place backfill until the bedding and pipe work installed has been inspected, tested and approved by the Inspector. Remove excavated rocky material unsuitable for backfill from the site prior to final backfilling.

P. Bedding material immediately around a utility line and to a point 6 inches above the line should consist of sand, fine-grained gravel, or cement slurry to support the line and protect it.

Q. Bedding zone shall be defined as the area containing the material specified that is supporting, surrounding, and extending to 6” (inches) above the top of pipe. Compaction requirements in this area must meet 90%.

R. Bedding material shall first be placed on a firm and unyielding subgrade so that the pipe is supported for the full length of the barrel. There shall be 6” (inch) minimum of bedding below the pipe barrel and 1” (inch) clearance below a projecting bell for sewer, storm drain and water pipe. The material in the bedding zone shall be placed and densified by mechanical compaction only.

S. Mechanically compacted backfill shall comply with section 306-1.3.2 of the Standard Specifications for Public Works Construction.

T. Above the bedding, up to finished subgrade at areas other then landscape areas and up to one foot below flatwork and pavements, utility trenches should be backfilled with granular materials and mechanically compacted to at least 90%.

U. Concrete backfill trenches that carry below or pass under footings and that are excavated within 18 inches of footings. Place concrete to level of bottom of footings.

V. Fill voids with approved backfill materials as shoring bracing and sheeting is removed.

3.07 INSPECTION & TESTING AT TRENCHES

A. Pipe will be inspected in the field before and after laying. If any cause for rejection is discovered in a pipe after it has been laid, it shall be subject to rejection. Any corrective work shall be approved by the Engineer and shall be at NO cost to the Owner.

B. The Inspector or Geotechnical Engineer will inspect all subgrades and excavations prior to placing bedding & backfill materials.

C. **DO NOT** place backfill until the bedding and pipe work installed has been inspected, tested and approved by the Inspector. Remove excavated rocky material unsuitable for backfill from the site prior to final backfilling.

D. Utility backfill compaction test shall be performed in accordance with ASTM D1557, method "C".

E. Utility backfill in place density test per ASTM D 1556 (sand cone) or other test method as considered appropriate by the Geotechnical Engineer.

F. Hydrostatic pressure tests shall be done only after backfill has been placed and final compaction has been achieved.

3.08 STORAGE OF SOIL MATERIALS

A. Stockpile excavated materials acceptable for backfill and fill soil materials, including acceptable borrow materials. Stockpile soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees. Cover to prevent wind-blown dust.

3.09 PLACEMENT OF ENGINEERED FILL

A. Spreading and Compacting Fill Material:

1. Site soils and/or import materials approved for use as fill should be placed in loose horizontal lifts not exceeding 8 inches, moisture conditioned to a minimum of one (1) percentage point above optimum moisture content per ASTM D1557-12 Test Method, unless otherwise stated.

B. Compaction Testing:

1. The Geotechnical Engineer's representative shall observe the excavation, filling, and compacting operations and shall make density tests in the fill material so that he can state his opinion as to whether or not the fill was constructed in accordance with the specifications. If the surface is disturbed, the density tests shall be made in the compacted materials below the disturbed zone. When these tests indicate that the density or moisture content of any layer of fill or portion thereof does not meet the specified density or moisture content, the particular layer or portions shall be reworked until the specified density and moisture content have been obtained.

2. Sampling and testing of materials for determination of compliance with the specified compaction requirements will be conducted by the Geotechnical Engineer's representative at any location and time as the Owner may determine.

3. The Contractor shall be responsible for excavation of the test pits and for providing and installing any shoring, ladders, or other equipment necessary to protect the testing personnel. The Contractor shall also suspend operations as necessary and at no cost to the owner for the purpose of conducting such testing.

4. Test pits shall be excavated in the backfill by the Contractor as directed by the Engineer for the purpose of testing the backfill compaction. At the option of Engineer, density tests may be taken on a lift of compacted backfill immediately before placing the next lift.

5. Any settlement noted in backfill, fill, or in structures built over the backfill or fill within the one-year warranty period will be considered to

be caused by improper compaction methods and shall be corrected at the Contractor's expense. Structures damaged by settlement shall be restored to their original condition by the Contractor at the Contractor's expense.

6. When initial compaction testing performed by the Engineer indicates the required density has not been obtained, the Contractor shall re-compact or replace the backfill as necessary to meet the specified minimum density.

7. The Contractor shall be responsible for rescheduling compaction testing with the Engineer and shall bear all costs for subsequent retesting in the areas of noncompliance. Costs associated with retesting and scheduling delays shall be the sole responsibility of the Contractor. The Engineer will deduct the costs for testing of materials and work found to be unacceptable, as determined by the tests performed by the Owner and the costs for testing of material sources identified by the Contractor which are not used for the work, from moneys due or to become due to the Contractor. The amount deducted will be determined by the Engineer.

3.10 BACKFILL - GENERAL

A. Backfill excavations promptly, but not before completing the following:

1. Acceptance of construction below finish grade including, where applicable, dampproofing, waterproofing, and perimeter insulation.

2. Surveying locations of underground utilities for record documents.

3. Testing, inspecting, and approval of underground utilities.

4. Concrete formwork removal.

5. Removal of trash and debris from excavation.

6. Removal of temporary shoring and bracing, and sheeting.

7. Installing permanent or temporary horizontal bracing on horizontally supported walls.

3.11 FIELD QUALITY CONTROL

A. A Geotechnical Engineer, designated by the Owner, will be engaged to perform continuous inspection of the placing and compacting of all fills and backfills within the limits of grading of this project. All work shall be done in accordance with the approved plans and these specifications and as recommended and approved by the Geotechnical Engineer. Revised recommendations relating to conditions differing from the approved soils engineering and engineering geology reports shall be submitted to the owner, inspector, architect and the

civil engineer. Costs for all such inspections and tests shall be paid by the Owner. The Contractor shall be responsible for notifying the Geotechnical Engineer in advance so that he may be present to perform his services as needed.

B. The Geotechnical Engineer shall submit compaction reports to the Construction Manager and the Architect at the completion of the work, including test results and plot plans indicating the locations from which the tested samples of fill were taken. The Geotechnical Engineer shall keep the Construction Manager informed on the progress of the grading work.

C. Testing Agency Services: Allow testing agency to inspect and test each subgrade and each fill or backfill layer. Do not proceed until test results for previously completed work verify compliance with requirements.

1. Perform field in-place density tests according to ASTM D 1556 (sand cone method) or other test method as considered appropriate by Geotechnical Engineer.

a. Field in place density tests may also be performed by the nuclear method according to ASTM D 2922, provided that calibration curves are periodically checked and adjusted to correlate to tests performed using ASTM D 1556. With each density calibration check, check the calibration curves furnished with the moisture gages according to ASTM D 3017.

b. When field in place density tests are performed using nuclear methods, make calibration checks of both density and moisture gages at beginning of work, on each different type of material encountered, and at intervals as directed by the Architect.

2. Trench Backfill: In each compacted initial and final backfill layer, perform at least one field in place density test for each 150 feet or less of trench, but no fewer than two tests.

D. When testing agency reports that subgrades, fills, or backfills are below specified density, scarify and moisten or aerate, or remove and replace soil to the depth required, recompact and retest until required density is obtained.

3.12 PROTECTION

A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.

B. Repair and re establish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or lose compaction due to subsequent construction operations or weather conditions.

1. Scarify or remove and replace material to depth directed by the Architect; reshape and recompact at optimum moisture content to the required density.

C. Settling: Where settling occurs during the Project correction period, remove finished surfacing, backfill with additional approved material, compact, and reconstruct surfacing.

1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to the greatest extent possible.

3.13 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Disposal: Remove surplus satisfactory soil and waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off the Owner's property.

END OF SECTION 31 20 00

SECTION 32 12 16 - ASPHALT PAVING

PART 1 - GENERAL

1.1 REQUIREMENT

A. The Contractor shall furnish all tools, equipment, materials, and supplies and shall perform all labor required to complete the work as indicated in the Contract Documents and specified herein.

B. The following types of pavement shall be covered in this Section:
   1. Paving for utility trenching, parking lots, playgrounds, areas between buildings, adjacent to planting and turf areas, and as indicated on Construction Documents.

C. Related Sections:
   1. Section 31 20 00: Earthwork.
   2. Section 32 12 36: Seal Coats.

1.2 WARRANTY

A. The contractor shall provide a manufacturer’s warranty against “aligatoring” and settlement.

1.3 QUALITY ASSURANCE

A. The work provided herein shall conform to and be in accordance with the Contract Plans, General Conditions/Specifications and Special Provisions, as well as the Standard Specifications for Public Works Construction (“GREENBOOK”), 2021 Edition, adopted by the Southern California Chapter, American Public Works Association; herein referred to as the “Standard Specifications”.

B. The Owner's inspector shall test the temperature of each batch of asphaltic concrete prior to placement. At the time of delivery to the work site, the temperature of mixture shall not be lower than 260 degrees F or higher than 320 degrees F, the lower limit to be approached in warm weather and the higher in cold weather. If asphaltic concrete temperature is not within these tolerances the affected batch shall be rejected. Any and all costs due to the rejected asphaltic concrete shall be the responsibility of the paving contractor.

1.4 ESTABLISHMENT OF GRADES

A. The Contractor’s Surveyor will set grade stakes. The Surveyor shall be a California registered land surveyor or licensed Civil Engineer. The Surveyor shall be hired and paid by the Contractor, and shall be subject to the approval of the Owner. Contractor shall notify the Owner at least 48 hours before staking is to be started. The Owner will determine if work is ready for staking.

B. All work shall conform to the lines, elevations, and grades shown on the Construction Plans. Three consecutive points set on the same slope shall be used together so that any variation from a straight grade can be detected. Any such variation shall be reported to the Engineer. In the absence of such report, the Contractor shall be responsible for any error in the grade of the finished work.

C. Protect and maintain stakes in place until their removal is approved by the Owner. Grade or location stakes lost or disturbed by Contractor, shall be reset by the Surveyor at the expense of Contractor.

D. Areas having drainage gradients of 2 percent or more shall have elevation stakes, set with instrument, at grid intervals of 25 feet. Intermediate stakes may be set by using a tightly-drawn string line over the tops of adjacent stakes. Grade stakes must be set at all grade breaks, grade changes, etc.

E. Areas having drainage gradients of less than 2 percent shall have elevation stakes, set with instrument, at 10 foot intervals. Grade stakes must be set at all grade breaks, grade changes, etc.

1.5 SUBMITTALS

A. Mix Designs: The CONTRACTOR shall formulate a job-mix formula using the Hveem method in accordance with Standard Specifications Section 203-6.2 and submit it to the ENGINEER for approval. The resultant mixture shall have Hveem properties conforming to Standard Specifications Section 203-6.4.3.

B. Samples:

1. Prior to the delivery of specified aggregate to the site, the CONTRACTOR shall submit samples of the material for the INSPECTOR’s acceptance in accordance with Standard Specifications Section 4-1.4. Samples shall be typical of materials to be furnished from the proposed source and in conformance with the specified requirements.

2. Aggregate base gradation and quality certifications shall be dated within 30 days of the submittal.

C. Certificates

1. Twenty days prior to the delivery of aggregates, asphalt materials, and paving mixes to the project site, the Contractor shall submit to the Engineer certificates and test results of compliance of such materials with these specifications.
2. Submit certificates of compliance from the supplier for bituminous materials for paint binder, asphaltic concrete, and seal coat.
3. Submit weigh master's certificates or certified delivery tickets for each truck load of asphaltic material delivered to the project site.
4. Upon completion of the weed control treatment, and as a condition for final acceptance, furnish a written certificate stating the brand name of the sterilant

and the manufacturer, and that the sterilant used had at least the minimum required concentration, and that the rate and method of application complied in every respect with the conditions and standards contained herein.

1.6 QUALITY CONTROL

A. Asphaltic Concrete Producers Qualifications: Use only materials furnished by a bulk asphaltic concrete producer regularly engaged in production of hot mix, hot laid bituminous concrete.

B. Applicator Qualifications: Paving machine and roller operators shall be fully trained and experienced in the installation of asphaltic concrete paving on projects of similar size and complexity.

C. Regulatory Requirements: The quantity of volatile organic compounds (V.O.C.) used in weed killer, seal coat, primer and other materials shall not exceed the limits permitted under the current regulations of the local authorities having jurisdiction.

1.7 ENVIRONMENTAL LIMITATIONS

A. Do not apply asphalt materials if substrate is wet or excessively damp or if the following conditions are not met:

1. Tack Coats: Minimum surface temperature of 60 deg F.
2. Asphalt Base Course: Minimum surface temperature of 40 deg F and rising at time of placement.
3. Asphalt Surface Course: Minimum surface temperature of 60 deg F at time of placement.

1.8 PAVEMENT-MARKING PAINT

A. Proceed with pavement marking only on clean, dry surfaces and at a minimum ambient or surface temperature of 40 deg F for oil-based materials, 50 deg F for water-based materials, and not exceeding 95 deg F.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Base Course Material: Crushed aggregate base material shall consist of materials that meet the provisions of Specifications Section 31 20 00 Earthwork, Part 2.01E.

B. Asphalt Surfacing Materials: Furnish asphalt surfacing meeting the following requirement, furnished from a commercial asphalt central mixing plant.

1. Paint Binder/Tack Coat: Asphalt emulsion shall be CSS-1 or CSS-1h and shall conform to the requirements of Standard Specifications Section 203-3 Emulsified Asphalt.
2. Asphalt Concrete Composition & Grading:
   a. Asphalt concrete shall conform to Standard Specification Section 203-6.5.4, Type III-C3-PG-64-10.
   b. At least two courses of asphalt shall be laid when asphalt pavement is greater than 3 inches. The surface course shall be a minimum thickness of one inch (1") and a maximum of two inches (2").
   c. Rubberized asphalt paving is not allowed.

C. Weed Control: Not required.

D. Headers and Stakes:

1. Headers: Pressure Treated Redwood, Construction Heart Grade, size 2 x 6, unless otherwise indicated on construction drawings
2. Stakes: 2 x 4 redwood or 2 x 3 Douglas fir, Construction Grade.
3. Nails: Common, galvanized, 12d minimum.

PART 3 - EXECUTION

3.1 HEADERS

A. Install headers along edge of bituminous surfacing abutting turf, earth, or planting area, unless indicated otherwise.

B. Install headers so the bottom surface has continuous bearing on solid grade. Where excavation for headers is undercut, thoroughly tamp soil under the header. Compact backfill on both sides of header to the density of adjacent undisturbed earth.

C. Fasten headers in place with redwood or Douglas fir stakes of length necessary to extend into solid grade a minimum of 12 inches. Stakes shall be of sound material, neatly pointed, driven vertically, and securely nailed to headers. Space stakes, not to exceed 4 feet on centers with top of stakes set one inch below top of header. Provide a minimum of 2-12d galvanized common nails through each stake.

D. Remove existing headers where new surfacing is installed adjacent to existing surfacing.

E. Install temporary headers at transverse joints of paving where continuous paving operations are not maintained.

F. Provide additional stakes and anchorage as required to fasten headers in place

3.2 SUBGRADE PREPARATION

A. Subgrade Preparation.
   1. Refer to Asphalt Pavement Detail 1 on sheet C003 of the construction documents.

   2. Prior to placement of compacted fill, the contractor should request an evaluation of the exposed excavation bottom by the Geotechnical representative.

B. The compacted surface shall be firm, hard and unyielding. The term "firm, hard and unyielding" as used in S.S.P.W.C. Section 301-1.3 shall mean that when the heaviest construction and hauling equipment used on the project drives over the subgrade, no permanent deformation shall occur either before or during pavement construction. On areas where the underlying material appears to be wet or soft, or where it deflects under wheel loads, the Contractor shall employ excavation and work techniques which do not worsen the subgrade condition.

C. A California Licensed Surveyor (LS) must provide grade stakes and elevations for the Geotechnical Engineer to verify that the over-excavation depths, shown on the construction drawings for asphalt concrete pavement structural sections, have been achieved prior to re-compaction.

D. Subgrade tolerances: Subgrade for pavement shall not vary more than 0.02’ from the specified grade and cross section established by the Engineer. Subgrade for subbase or base material shall not vary more than 0.04’ from the specified grade and cross section. Variations within the above specified tolerances shall be compensating so that the average grade and cross section specified are met.

E. Correct irregularities by dressing down or filling as may be required, to bring areas to true subgrade elevations.

F. Where filling is required, scarify the subgrade to bond the new material to the in place material; use additional material as required, subject to the approval of the Architect, and provided by the Contractor.

G. Remove excess material from the site to a legal disposal area.

3.3 APPLICATION GENERAL

A. Finish elevations, extent of asphalt paving and locations of type of asphalt and class of base shall be as indicated and specified herein and on the Construction Documents. Bring subgrade elevations sufficiently below the finish elevations of the paving so as to accommodate the thickness of paving and base.

3.4 APPLICATION OF BASE COURSE

A. Install base course material, encompassing spreading and compacting, in accordance with the S.S.P.W.C. Section 301-2, Untreated Base.

B. Aggregate bases material shall be installed in layers not exceeding 4-inches and compacted to a minimum of 95% relative density.

C. After preparing the subgrade as specified in 3.2.A, all traffic on the subgrade shall be avoided. Should it be necessary to haul over the prepared subgrade, the CONTRACTOR shall drag and roll the traveled way as frequently as may be necessary to remove ruts, cuts, and breaks in the surface. All cuts, ruts, and breaks in the surface of the subgrade that are not removed by the above operations shall be raked and hand tamped. All equipment used for transporting materials over the prepared subgrade shall be equipped with pneumatic tires.

D. Continued use of sections of prepared subgrade for hauling, so as to cut up or deform it from the true cross-section, will not be permitted. The CONTRACTOR shall protect the prepared subgrade from all traffic.

E. Maintain the surface in its finished condition until the succeeding layer is placed.

3.5 PLACING ASPHALT CONCRETE SURFACING:

A. Asphalt binder (tack coat) shall be applied to all existing pavement surfaces to be overlaid and/or joined per section 302-5.4 of the Standard Specifications. Asphalt binder (tack coat) shall be applied to existing surfaces to be surfaced and between layers of asphalt concrete, except when eliminated by the Engineer. A layer of asphalt binder (tack coat) shall be applied to all vertical-cut faces and between subsequent AC lifts.

B. Asphalt Concrete Pavement:

1. All work shall be in accordance with Section 302-5 of the Standard Specifications, except as noted herein. Asphalt concrete work shall include full-depth patching and variable thick asphalt concrete transition areas. The Contractor shall, on a daily basis, provide the Inspector with copies of certificates of weight for all materials delivered to the job site and/or incorporated in the work. At no time shall the coarse aggregate that has segregated from the mix be scattered across the paved mat.
2. Asphalt concrete shall not be placed on any surface, which contains ponded water or excessive moisture in the opinion of the Engineer. If paving operations are in progress and rain or fog forces a shut down, loaded trucks in transit shall return to the plant, and no compensation will be allowed therefore. The Contractor shall furnish and use canvas tarpaulins to cover all loads of asphalt from the time that the mixture is loaded until it is discharged from the delivery vehicle, unless otherwise directed in writing by the Engineer
3. The Inspector will examine the base before the paving has begun. The Contractor will correct any deficiencies before the paving is started.
4. Wherever AC pavement does not terminate against a curb, gutter, or another pavement, the Contractor shall provide and install a redwood or pressure treated Douglas fir header at the line of termination.

5. Pavement at all longitudinal joints shall have a Field Density of 95%, as described in 302-5.6.2 of the Standard Specifications. When the test results of the field cores are less than 95% Relative Compaction, the Contractor shall remove a 1 foot wide section on each side of the longitudinal joint. The Contractor shall replace the removed pavement with an asphalt mix that meets the job specification at no additional cost to the Owner.
6. Pavement tolerances: within 1/8-inch of design thickness and 1/8-inch from design elevation.

3.6 FLOOD TESTING

A. Flood Test: Before acceptance, all pavements shall be water tested to ensure proper drainage as directed by the Inspector. The Contractor shall provide water for this purpose. The flooding shall be done by water tank truck. Depressions where the water ponds to a depth of more than 1/8-inch shall be filled or the slope corrected to provide proper drainage. The edges of the fill shall be feathered and smoothed so that the joint between the fill and the original surface is invisible. No standing water shall remain after 60 minutes on a 70 degree F (or warmer) day.

3.7 SEAL COAT

A. Allow new asphalt pavement to cure a minimum of 15 days before application of seal coat. See Project Specification Section 32 12 36: Seal Coats.

3.8 FIELD QUALITY CONTROL

A. Thickness: Tolerances for asphalt pavement thickness shall be ¼ inch, plus or minus.

B. All paving shall drain properly before being accepted. Upon completion, the pavement shall be true to grade and cross section. The asphalt substrate, shall not vary from the planned cross slope by more than +- 0.1. When a 10 foot straightedge is laid on the finished surface of the asphalt, the surface shall not vary from the edge of the straightedge more than 1/8 inch, except at grade breaks. Where paving does not meet these tolerances, the paving material shall be repaired by a method determined by the Owner. Repairs shall not be made to pavement surface by feather-edging at the join lines. All expenses for pavement repair up shall be borne by the Contractor at NO cost to the Owner.

C. Corrective Measures: It is the Contractor’s responsibility to determine if the planarity, cross slopes, and general specifications have been met. If all of the conditions have been met the Contractor must notify the Owner in writing of the acceptance of the asphalt paving.

3.10 PROTECTION

A. Protect the Work of this section until Substantial Completion.

3.11 CLEAN UP

A. Clean all debris and unused materials from the paving operation. Clean all surfaces that have been spattered or defaced as a result of the paving operation. Asphalt or asphalt stains which are noticeable upon surfaces of concrete, or materials which will be exposed to view, shall be promptly and completely removed. Cleaning shall be done in a manner that will not result in any discharge of contaminated materials into any catch basin. All expenses for clean up shall be borne by the Contractor at NO cost to the Owner.

END OF SECTION 32 12 16

SECTION 32 12 36 - SEAL COATS

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Surface sealer over new asphalt paved surfaces.

1.02 REFERENCES

A. Conform to Section 203 and 302 of the Standard Specifications for Public Works Construction.

B. Comply with International Slurry Surfacing Association (ISSA) performance guidelines.

1.03 SUBMITTALS

A. Product Data: Submit manufacturer's product information and application procedures for bituminous surfacing.

1.04 QUALITY ASSURANCE

A. Comply with the following as a minimum requirement: Standard Specifications Section 203-9, “SEALCOAT – ASPHALT BASED”.

B. Obtain materials from same source throughout.

C. Schedule a pre-construction conference at jobsite in advance of beginning of Work. In existing areas to be seal coated and restriped, document existing striping to be duplicated before commencing seal coating work.

D. Review and resolve conflicts involving requirements of specifications. Record discussions and furnish copies to all attendees.

E. Beginning of Work means Contractor accepts all conditions.

F. Agitate bulk materials during transport.

1.05 REGULATORY REQUIREMENTS

A. Comply with local air quality management district regulations for emissions maximums.

B. Maintain control of vehicular and pedestrian traffic during seal coating operations as required for other construction activities and in accordance with local traffic authorities having jurisdiction.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Seal Coat: The materials for sealcoat shall conform to Section 203-9 – "Sealcoat – Asphalt Based" of the Standard Specifications. Before incorporation in the Work, the Contractor shall submit a 2 Liter (2-quart) sample of undiluted seal coat at no cost to the Owner.

1. Seal Coat: Provide one of the following surface seals:

Product Name	Manufacturer
GuardTop	Vulcan Materials Company
Over Kote	Diversified Asphalt Product
Park Top	Western Colloid Products
Sure Seal	Asphalt Coating Engineering
MasterSeal	SealMaster Pavement Products & Equipment

B. Crack Sealing: Crack sealant shall be CalSeal Modified Asphalt joint sealant as manufacturered by Henry Inc, Crafco Polyflex Type 3 or equal.

PART 3 - EXECUTION

3.01 REPAIRING AND SEALCOATING OF SURFACES

A. Preparation of Surfaces:

1. Before placing the sealcoat, the pavement surface shall be cleaned by sweeping, flushing or other means necessary to removal all loose particles of paving, all dirt, and all other extraneous material. This shall include vegetation in pavement cracks and between pavement and curb/gutter. Prior to removal an approved herbicide, which leaves behind a visible blue marker dye, shall be sprayed where vegetation exists. Surface contaminates, grease or oil spots shall be cleaned to allow for proper adhesion.

2. Prior to applying sealcoat material, cracks wider then 1/8 inch shall be cleaned, treated with weed killer, and filled with an asphalt-based crack filler (large cracks may require several applications). For best quality, it is recommended that all broken asphalt be removed and patched with new asphalt. It is also suggested that extreme low spots be filled with new asphalt. New asphalt must cure 30 days before application of sealcoat.

3. Immediately before commencing the sealcoat operations, all surface metal utility covers (including survey monuments) shall be protected by thoroughly covering the surface with an appropriate adhesive and oiled or plastic paper. No adhesive material shall be permitted to cover, seal or fill the joint between the frame and cover of the structure. A vertical tab shall be placed on each cover for locating after the seal application is complete. The tab shall extend at least 3" above the existing pavement surface. Covers are to be uncovered and cleaned of asphalt emulsion material by the end of the same work day. Inspector shall inspect surfaces before the installation of seal coat.

4. For best results, the asphalt, just prior to being sealed, should be sprayed with a mist of water in an amount that will leave the surface damp but with no puddles or visible water. This procedure is critical when ambient temperature is hot with bright sunlight or when the pavement is excessively aged or porous.

5. A prime or tack coat may be necessary on surfaces that have weathered excessively or are dusted. The primer should be diluted with three parts clean, potable water and one part SS-1h emulsion and shall be applied at the rate of 0.05 gallon per square yard.

6. Install barricades as required to divert traffic from operations. Install temporary "no parking" signs and similar notices.

B. Application:

1. Sealcoat may be mixed with water to obtain desired consistency for job requirements to a maximum of 20% of the total volume. Care should be taken not to over dilute. Material after dilution shall be mixed with a mechanical agitator to maintain consistency and ease of application. Note that as the pavement increases in roughness, the amount of dilution should be decreased.

2. Sealcoat shall only be applied when the atmospheric temperature is greater than 55 degrees F and if rain is not forecast for the period of 24 hours after application.

3. The sealcoat material shall be applied in two applications. Unless otherwise specified, the total quantity applied (before dilution) shall be 50 gallons per 1,000 square feet.

4. Sealcoat material shall be applied using a truck-mounted tank or wheeled container in continuous parallel lines and spread by means of brooms or rubber-faced squeegees either by hand or machine and in such a manner as to eliminate all ridges, lap marks, and air pockets.

5. Hand tools shall be available in order to remove spillage. Ridges or bumps in the finished surface will not be permitted. Sealcoat material shall be homogeneous prior to spreading, with no visible separation of solids and liquids.

6. When the first coat has completely dried to the touch, apply the second coat. While misting is not normally required before second coat, surface should be clean with no foreign materials on it.

C. Drying Time:

1. Sealcoat should be allowed to dry 24 – 48 hours before permitting traffic. When asphalt is cold or in shade, or air temperature is below 75 degrees F, based on general weather, humidity and temperature conditions, drying time may need to be extended.

3.02 CLEAN UP

A. Remove rubbish, debris and waste materials and legally dispose of off the Project site.

B. Striping for parking or traffic flow should be done only after the sealcoat has thoroughly dried. It is recommended that a high quality water based Traffic Line Paint be used for best results.

3.03 PROTECTION

A. Protect the Work of this section until Substantial Completion.

END OF SECTION 33 30 00

SECTION 33 10 00 - WATER UTILITIES

PART 1 - GENERAL

1.01 SUMMARY

A. This section describes general requirements, products, and methods of execution relating to domestic water. Unless otherwise noted, this section does not apply to irrigation or fire water systems and water systems inside of buildings.

B. Contractor shall furnish all labor, materials, services, testing, transportation and equipment necessary for the completion of all plumbing and piping and including the demolition and removal of certain equipment, piping and appurtenances all as required and as indicated on drawings and specified herein. Work materials and equipment not indicated or specified which is necessary for the complete and proper operation of the work of this Section in accordance with the true intent and meaning of the contract documents shall be provided and incorporated at no additional cost to the Owner.

C. Section Includes:

1. Piping and specialties for underground domestic water outside the building.

2. Trenching Requirements: Conform to the requirements of Section 31 20 00 – Earthwork.

3. Hydrostatic Pressure, Leakage & Disinfection Testing.

1.02 SUBMITTALS

A. Product Data: Manufacturer’s catalog data for materials. Include technical data for piping, gaskets, joints and couplings, ball valves, valve boxes, tracer wire, detectable warning tape, and sand bedding.

B. Certificates: Certificates attesting that tests set forth in referenced publications have been performed and the performance requirements have been satisfied.

1.03 LICENSES, PERMITS & FEES

A. The Contractor installing the water lines shall have a Class “C-34”, “C-36” or Engineering “A” Contractors license valid in the State of California.

B. The Contractor shall obtain all necessary permits, licenses, or agreements required by any legally constituted agency, pay for all fees and give all necessary notices required for the construction of the work. The Owner shall reimburse the contractor for all necessary permits or inspection fees by any legally constituted agency.

1.04 QUALITY ASSURANCE

A. California Plumbing Code, CPC, 2019 Edition.

B. Comply with the following as a minimum requirement:

1. Manufacturers Standardization Society (MSS) of the Valve and Fittings Industry:

a. MSS-SP-80 Bronze Gate, Globe, Angle and Check Valves.

b. MSS-SP-73 Silver Brazing Joints for Wrought and Cast Solder-Joint Fittings.

2. Uni-Bell PVC Pipe Association (UBPPA):

a. UBPPA UNI-PUB-9 Installation of PVC Pressure Pipe.

b. UBPPA UNI-B-13 Standard Performance Specification on joined restrained devices for use with Poly Vinyl Chloride (PVC) Pipe.

C. The work provided herein shall conform to and be in accordance with the Contract Plans, General Conditions/Specifications and Special Provisions, as well as the Standard Specifications for Public Works Construction ("Green Book"), 2021 Edition, adopted by the Southern California Chapter, American Public Works Association; herein referred to as the "Standard Specifications".

1.05 SEQUENCING AND SCHEDULING

A. Coordinate with other utility work.

1.06 PRODUCT HANDLING

A. Store items above ground on platforms, skids or other approved supports.

B. Deliver piping with factory-applied end-caps. Maintain end-caps through shipping, storage, and handling to prevent pipe-end damage and to prevent entrance of dirt, debris, and moisture.

C. Store plastic piping protected from direct sunlight. Support to prevent sagging and bending.

D. Handling: Use sling to handle valves and fire hydrants whose size requires handling by crane or lift. Rig valves to avoid damage to exposed valve parts. Do not use hand wheels or stems as lifting or rigging pongs.

E. Protect coating and linings on pipes, fittings and accessories from damage. Do not drag pipe to trench. Repair coatings or linings damaged.

1.07 DISPOSAL OF REMOVED MATERIALS INCLUDING ASBESTOS-CEMENT PIPE

A. All removed materials, except those indicated on the plans or described herein to remain the property of the Owner, shall become the property of the Contractor and shall be disposed in accordance with local, state, and federal laws. Should any of those materials be considered as hazardous the Contractor shall provide the Owners Inspector with paper custody trail documentation of the disposal.

B. Asbestos – Cement (A-C) Pipe Removal and Disposal: The plans for the project may indicate that existing asbestos-cement pipe is to be removed from the ground. Where so indicated the Contractor shall excavate with care, expose the pipeline and remove the A-C pipe to the nearest joint. Should the plans not call out the removal of the A-C pipe and A-C pipe is encountered, the Contractor shall obtain approval from the Inspector as to whether or not the A-C pipe is to be removed or can be left in place. Cutting of the pipe shall only be done if absolutely there is no other way to expose the length of pipe to the nearest joint that be separated and the Inspector approves the cutting of the pipe. Cutting of the pipe shall be done with a mechanical saw with a pressure water source to dampen the pipe and the dust from the cutting. To remove a coupling, the coupling may have to be broken in the trench. The pipe once removed from the trench may be broken for handling. The breaking shall be done within a plastic bagging or sheeting material to minimize the release of asbestos fibers into the atmosphere. Once removed and broken, if necessary, the A-C material shall be bagged and disposed of legally with the Inspector to be given a copy of all Contractor paperwork as to the legal disposal of the material. If the A-C pipe section(s) are removed intact the pipe can be removed by the Contractor from the project site and become the property and responsibility of the Contractor.

1.08 DRAWINGS

A. Because of the small scale drawings, it is not possible to indicate all offsets, fittings and accessories which may be required. The Contractor shall carefully investigate the conditions surrounding installation of his work, furnishing the necessary piping, fittings, valves, and other devices which may be required to complete the installation.

B. The general arrangement indicated on the drawings shall be followed as closely as possible. Coordinate with the Architectural, Structural, Mechanical and Electrical Drawings prior to installation of piping fixtures and equipment to verify adequate space available for installation of the work shown. In the event a field condition arises which makes it impossible to install the work as indicated, submit, in writing, the proposed departures to the Architect for his acceptance. Only when Architect's acceptance is given, in writing, shall Contractor proceed with installation of the work.

C. In case of a difference in the specifications or drawings, or between the specifications and the drawings or in the drawings, the Contractor shall figure

the most expensive alternate and after award of contract, shall secure direction from the Architect.

1.09 PROTECTION

A. All work, equipment and materials shall be protected at all times. Contractor shall make good all damage caused either directly or indirectly by his own workmen. Contractor shall also protect his own work from damage. He shall close all pipe openings with caps or plugs during installation. He shall protect all his equipment and materials against dirt, water, chemical and mechanical injury. Upon completion, all work shall be thoroughly cleaned and delivered in a new condition.

B. Contractor shall be held responsible for all damage to equipment and materials until he has received written notice from the Architect or Engineer that his work has been accepted.

1.10 LOCATIONS

A. The locations of apparatus, piping and equipment indicated on the drawings are approximate. Piping and equipment shall be installed in such a manner as to avoid all obstruction, preserve headroom, and keep openings and passages clear. The locations of and mounting heights of all fixtures shall be coordinated with the architectural plans and room elevations.

B. Clearances and Openings: Contractor shall cooperate and coordinate his work with all other trades to avoid confliction and permit for a neat and orderly appearance of the entire installation. The Contractor shall, in advance of the work, furnish instructions to the General Contractor as to his requirements for equipment and material installation of any kind, whether or not specifically mentioned on drawings or in the specifications, and shall include recesses, chases in walls, and all required openings in the structure. Should furnishing this information be neglected, delayed or incorrect and additional cuttings are found to be required, the cost of the same shall be charged to this Contractor.

1.11 INSPECTION

A. Notice shall be given to the School District Inspector at least 48 hours before starting construction.

B. Contractor shall not allow or cause any of his work to be covered up before it has been duly inspected, tested and approved by the Owner, Architect or any other authorized inspectors having legal jurisdiction over his work. Should he fail to observe the above, he shall uncover the work and, after it has been inspected, tested and approved, recover it at his own expense.

C. Inspection of the work shall not relieve the contractor of any obligations to complete the work as prescribed by the standard specifications. Any known defective work shall be corrected before testing or final inspection will be

permitted. Unsuitable materials may be rejected even if these materials have been previously overlooked by the Inspector.

D. The Owner shall have the authority to suspend the work completely or in part for such time as it may deem necessary if the contractor fails to carry out instructions given by the Owner, or to perform any required provisions of the plans and specifications. The contractor shall immediately comply with a written order of the Owner to suspend the work completely or in part. The work shall be resumed when improper methods or defective work are corrected as ordered and approved in writing by the Owner.

1.12 SUBSTITUTIONS

A. The Contractor assumes full responsibility that alternate manufacturers, items and procedures will meet the job requirements and is responsible for cost of redesign and of modifications to this and other parts of work caused by alternate items furnished under work in this Section. In view of these responsibilities, it is the purpose of these specifications to establish procedures which ensure that the Contractor has considered all the ramifications of proposed alternates before submitting them for review. Submittals which do not comply with the requirements of these specifications or which indicate proposed alternates were selected without proper regard to the requirements of the job, will not be approved. No more than one proposed alternate will be considered for each item.

B. This Contractor is responsible to provide sufficient information to allow the Engineer to analyze any proposed alternate. If inadequate information is provided, the proposal will not be approved and resubmittal will not be allowed.

C. The Architect or his authorized representative shall be the sole judge as to the quality and suitability of proposed alternate equipment, fixtures or materials and decisions of the Architect or that of his representative shall be final and conclusive.

1.13 RECORD DRAWINGS

A. Contractor shall provide and keep up-to-date a complete "as-built" record set of redline prints which shall show every change from the original drawings and the exact "as-built" locations and sizes of the work provided under this Section of the specifications. This set shall include locations, dimensions, depth of buried piping, cleanouts, shut-off valves, sewer invert locations, plugged wyes, tees, etc. On completion of the work, the Contractor shall incorporate all as-built information on a set of reproducible tracings provided by the Architect and this set of reproducibles shall be delivered to the Architect.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Pipe:

1. 3 inches and smaller - Schedule 80 PVC: Poly Vinyl Chloride (PVC) Plastic Pipe, Schedule 80, meeting ASTM D 1785 standards.

B. Fittings:

1. Poly Vinyl Chloride (PVC) Water fittings shall conform to ASTM D 2467 “Socket-Type” PVC Plastic Type Fittings, Schedule 80.

C. Ball Valves:

1. Ball valves 2” or smaller: Ball valves shall be silicon performance bronze alloy, Lead-Free, rated 600 psi, two-piece, threaded ends, full port, manufactured in accordance with MSS SP-110.

D. Valve Boxes, Risers and Lids for Buried Valves:

1. Valve boxes and cover shall be as shown on Construction Documents.

2. Valve riser material shall be 10-inch Schedule 80 PVC, or 10-inch SDR 35 PVC pipe

3. Paint domestic water valve box lids on school property with 2 coats of blue enamel.

4. Paint fire system valve box lids on school property with 2 coats of red enamel.

5. Valve boxes shall be marked “WATER” embossed above surface.

E. Tracer Wire for Nonmetallic Pipes: Tracer wires shall be electrically continuous #14 soft drawn copper wire, Type TW, blue plastic covered for potable water system and red for fire water system. Provide in sufficient length to be continuous over each installed section of nonmetallic pipe.

PART 3 - EXECUTION

3.01 CLEARANCES OF WATER LINE

A. Buildings: 3 feet.

B. Parallel to Sewer Line:

1. Water lines 4 inches or less in diameter shall not be installed in a common trench with the building sanitary drain unless the bottom of the water line is at least 12 inches above the top of the building sanitary drain or where the water line is installed on a solid shelf excavated on one side of the common trench with a minimum clear horizontal distance of 12 inches from the building sanitary drain.

2. Water mains larger than 4 inches in diameter shall be separated from the Project site sanitary sewer, receiving more than one building sanitary drain or acid pipeline, in accordance with the requirement of the State of California, Human and Welfare Agency, Department of Health Services.

C. Crossing Sewer Line:

1. A water main shall be separated from sanitary sewer in accordance with the requirements of the State of California Administrative Code, Title 22, Section 64630(e)(2), unless modified herein.

2. Install water main a minimum of 12 inches clear, above or below a sanitary sewer.

3. A water main greater than 4 inches in diameter, crossing under a sanitary sewer line, shall be installed with all their joints located at least 10 feet away from each side of the sanitary sewer line.

4. A water main greater than 4 inches in diameter, crossing over a sanitary sewer line, shall be installed with all their joints located at least 5 feet away from each side of the sanitary sewer line.

3.02 LAYING OF PVC PRESSURE PIPE

A. Installations of pipe, bends, and fittings shall be in accordance with Section 3.3 for ductile iron bends and fittings and AWWA C-605, “Underground Installation of (PVC) Pressure Pipe and Fittings for Water” and/or the Uni-bell guideline UNI-PUB-9, “Installation Guide for PVC Pressure Pipe”. PVC bends and fittings are not allowed. The Uni-Bell Handbook of PVC Pipe-Design and Construction shall be used for details of pipe installation practice except as follows and where noted otherwise on plans. Longitudinal bending of pipe sections is prohibited. Any directional change shall be accomplished through manufacturer approved 1 degree deflection of push on joints, 5 degree deflection with Certainteed – couplings, or ductile iron bends capable of withstanding 250 psi loads. A number 14 gauge, solid, soft drawn insulated copper tracer wire is required for PVC pipe installation. The tracer wire shall be wrapped around the pipe at 10-foot intervals and brought up inside each valve can to within 6 inches of the valve cover.

B. Acceptable line and grade for piping: The pipe shall be laid true to the line and grade shown on the plans within acceptable tolerances. The tolerance on grade is 1 inch. The tolerance on line is 2 inches.

C. A number 14 gauge, solid, soft drawn insulated copper tracer wire is required for PVC pipe installation on lines 2” and greater. The tracer wire shall be wrapped around the pipe at 10-foot intervals and brought up inside each valve can to within 6 inches of the valve cover.

D. Every precaution shall be taken to prevent foreign material from entering the pipe while it is being placed in the trench. If the pipe-laying crew cannot put the pipe into the trench and in place without getting soil into it, the Engineer may require that before lowering the pipe into the trench, a temporary plug be placed over each end and left there until the connection is to be made to the adjacent pipe. During the laying operations, no debris, tools, clothing or other materials shall be left in the pipe.

E. At times when pipe laying is not in progress, the open ends of pipe shall be closed by watertight plug or other means approved by the Inspector. This provision shall apply during the lunch-hour breaks as well as overnight. If water is in the trench, the seal shall remain in place until the trench is pumped completely dry.

F. The cutting of pipe for inserting tees, fittings or closure pieces shall be done in a neat workmanlike manner without damage to the pipe or cement lining and so as to leave a smooth end at right angles to the axis of the pipe. The beveled end of any PVC pipe shall be cut off before the pipe is inserted into a mechanical joint bend or fitting. No pipe shall be laid in water or when, in the opinion of the Engineer, trench conditions are unsuitable.

G. Should structural difficulties or Work of other trades prevent the running of pipes or the setting of equipment as indicated by Drawings, the necessary deviation will be allowed by the District's Inspector.

H. All water piping shall be adequately supported. Burred ends shall be reamed to the full bore of the pipe or tube. Change in direction shall be made by the appropriate use of fittings. All piping, equipment, appurtenances and devices shall be installed in conformity with the provisions and intent of the California Plumbing Code.

I. Install piping under streets and other obstructions that cannot be disturbed, by tunneling, jacking, or combination of both.

J. When connecting plastic pipe to copper, brass, or steel material, provide a schedule 80 PVC nipple.

K. Cure welded joints at least 15 minutes before moving or handling, and at least 24 hours before applying pressure to system, unless otherwise recommended by joint solvent manufacturer.

L. Field inspection for plastic pipe and fittings shall follow section 306-1.2.12, Standard Specifications for Public Works Construction, 2015 edition.

3.03 CONNECTIONS TO EXISTING UTILITIES

A. All tie-in locations shall be excavated a minimum of TWO (2) working days in advance of final connection to expose the affected portions of existing pipelines and to allow time for the necessary measurements, assembling of materials and

equipment, and assuring that all pre-assembled piping and fittings will be compatible with the existing main.

B. Changes or delays caused by the Contractor's failure to perform "Potholing" and interference location work shall not be eligible for extra work, compensation, or time extension.

C. The Contractor shall immediately notify the District Inspector in writing, upon learning of the existence or location of any utility facility omitted from or shown incorrectly on the contract drawings, or improperly marked or otherwise indicated. The Contractor shall provide full details as to depth, location, size and function of the utility in writing to the IOR and note it on the "as-built" plans.

D. The Contractor shall furnish and place the necessary protection around a utility when protection is called for on the contract drawings, visible to the Contractor, or marked as such. The Contractor shall install the utility protection at no additional expense to the Owner.

3.04 VALVES

A. Water valves shall be installed at locations shown on the Construction Drawing, or as directed by the Inspector. Valves shall be set plumb, and shall be stabilized and supported separately from the pipeline. Information regarding size, type, make, and number of turns to close shall be supplied to the Utility. All valves shall be covered with a valve box assembly. Valve boxes shall be plumb, centered over the valve nut, and supported separately from the valve body. Valve boxes shall be lowered to below paving grade level prior to street paving, and after final grade has been established by the final grade. In any event, Contractor shall ensure that all valve boxes will provide access to the operation of the valve by the Utilities' personnel. Valve boxes shall be flagged or barricaded during construction to divert traffic around their location.

B. Stainless steel parts shall not be coated except for the threaded portion, which will be assembled with a liberal coat of anti-seize compound.

3.05 PROTECTION OF METAL SURFACES

A. All exposed surfaces of the valves, flanges, bolts, nuts, tie-rods, turn buckles, etc. in contact with the earth and backfill materials shall be coated with a minimum of 30 mils of bitumastic coating prior to backfilling. In addition to this bitumastic coating, all iron or steel surfaces such as valves, flanges, bolts, nuts, couplings, shall be encased in 8 mil polyethylene wrapping in accordance with AWWA C105 "American National Standard for Polyethylene Encasement for Ductile-Iron Pipe Systems".

3.06 PIPELINE FLUSHING & HYDROSTATIC TESTING

A. General Requirements

1. Hydrostatic testing and disinfecting (chlorination and flushing) of newly laid or repaired pipelines and appurtenances must be completed before the pipelines can be connected to the existing water distribution system. Pipelines and appurtenances shall remain isolated from the existing water distribution system during hydrostatic testing and disinfecting.

2. All services, air release valves, and other appurtenances connected to the newly laid pipeline shall be pressure tested and disinfected at the same time as that of the pipeline. Care shall be taken to expel all air from the pipeline and services during any filling operation.

B. Temporary Piping and Appurtenances for Flushing, Testing, and Disinfecting

1. The Contractor and/or subcontractor shall supply all temporary piping, corporation and curb stops, test plates, bulkheads, plugs, pipe end caps, valves, fittings, calibrated meters, equipment, labor and method necessary for pressure testing, chlorinating, and flushing of the newly laid pipeline. The Contractor shall also provide any temporary piping, backflow devices, and appurtenances needed to carry potable water to the section of pipeline being flushed, pressure tested, or disinfected.

2. Corporation and curb stop taps used for flushing, pressure testing, and disinfecting shall comply with service tap requirements for ductile iron pipe. Unless specified otherwise, the tap shall be made at the top of pipe.

3.07 HYDROSTATIC (PRESSURE) TESTING FOR DOMESTIC WATER SYSTEM

A. After completion of the hydrostatic testing, the subcontractor shall provide a signed copy of all test results to the Inspector. The Contractor and Inspector shall be present during the testing.

B. Test PVC plastic water system in accordance with UBPPA UNI-B-3 for pressure and leakage. The amount of leakage from PVC piping shall not exceed the amounts given in UBPPA UNI-B-3, except that no leakage is permitted for joints installed with sleeve type mechanical couplings.

C. Test water service lines in accordance with applicable requirements of AWWA C 600. No leakage is permitted

D. Pressure testing: Before pressure test, fill portion of piping being tested with water for a minimum of 24 hours. Provide hydrostatic pressure of 50 psi greater than the maximum working pressure of tested system. Provide and maintain hydrostatic test pressure for at least 2 hours to ensure no leakage of any portion of piping or appurtenances under pressure test.

E. Repetition of Hydrostatic Test: If the leakage in the section of pipeline being tested exceeds the maximum allowable rate specified above, such section will

be considered defective. The Contractor shall determine the points of leakage and make the necessary repairs at his expense. The subcontractor will then conduct another hydrostatic test. This procedure shall be continued until the leakage falls below the allowed maximum.

F. After Satisfactory Hydrostatic Test:

1. All valves shall be tested for leak proof tightness after the pipeline hydrostatic test with the test pressure on one side of the valve and atmospheric pressure on the other side.

2. After test sections have successfully met the hydrostatic test requirements to the satisfaction of the Inspector, the entire pipeline or each test section shall be filled or shall remain filled with potable water until the pipeline is disinfected. Test plates, corporation stops, and other test facilities shall remain in place if needed for disinfecting or removed as directed by Inspector.

3. Regardless of the hydrostatic test results, the Contractor shall repair all detectable leaks.

3.08 DISINFECTION PROCEDURES

A. All potable water lines MUST be disinfected per the following requirements.

B. The Contractor shall supply all materials, labor, equipment and methods necessary to disinfect the water main. The Contractor shall hire a State certified laboratory to perform the required bacteriological tests for the newly laid pipelines.

C. Preparation for Disinfecting Pipelines: Contractor shall tightly shut off every service connection served by the pipeline being disinfected at the curb stop before water is applied to the pipeline. Care should be taken to expel all air from the main and services during the filling operation.

D. Inject solution of liquid chlorine or sodium hypochlorite and water containing at least 50 PPM of free chlorine into a system in a manner to ensure that entire system is completely filled with solution. During this procedure operate valves and test outlets for residual chlorine. Continue injection until outlets indicate at least 59 PPM of free chlorine.

E. After injection, isolate system and hold solution in retention for a period of at least 8 hours. Perform tests for residual chlorine after retention. If such tests indicate less than 50 PPM of residual chlorine, repeat entire procedure. After satisfactory sterilization has been verified, flush entire system until all traces of chlorine have been removed or until chlorine content is no greater than in existing water supply.

3.09 DISPOSAL OF TEST WATER

A. The disposal of all water used in flushing, hydrostatic testing, and disinfecting the sections of pipeline shall be the sole responsibility of the Contractor. The disposal of water shall, in all cases, be carried out in strict observance of the water pollution control requirements of the California Regional Water Quality Control Board.

B. The Contractor shall obtain an NPDES permit and comply with that permit in his discharge of test water.

C. The Contractor shall apply a reducing agent to the solution to neutralize residual chlorine or chloramines remaining in the water. Additionally, the flow of water from the sections of pipeline shall be controlled to prevent erosion of surrounding soil, damage to vegetation, altering of ecological conditions in the area, and damage to any construction or maintenance activity occurring in any ditch or storm drain downstream of discharge.

3.10 CONNECTING TO EXISTING DISTRIBUTION SYSTEM

A. After all hydrostatic tests and disinfecting has been completed and demonstrated to comply with the Specifications, the Contractor shall connect newly laid pipeline to the existing distribution system.

B. Where connections are to be made to an existing potable water system, swab or spray the interior surfaces of all pipe and fittings used in making the connections with a five (5) percent or greater hypochlorite solution as directed by the Inspector.

C. As soon as the connection is completed, thorough flushing is required until all discolored water is removed.

3.11 REMOVAL OF TEMPORARY PIPING AND APPURTENANCES

A. After the newly laid section of pipeline has been approved by the Inspector for connection to the existing distribution system, the Contractor shall disconnect and remove all temporary piping, fittings, test plates, backflow devices, and other appurtenances used for pressure testing, chlorinating, and flushing.

B. Contractor shall remove and replace all stops used for testing and disinfecting of the pipeline with stainless steel repair clamps.

3.12 CLEANING

A. Remove rubbish, debris, and waste materials and legally dispose of off the Project site.

3.13 PROTECTION

A. Protect the Work of this section until Substantial Completion.

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END OF SECTION 33 10 00