SPECIFICATIONS

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
APP: 01-119995 INC:
REVIEWED FOR
SS ☑ FLS ☑ ACS ☑
DATE: 7/18/2023

FOR THE

REMODEL

OF

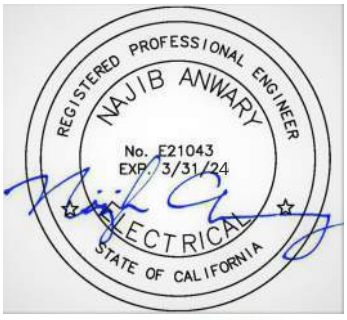
SHERWOOD ELEMENTARY SCHOOL

NEW BUS DROP-OFF AND PARKING AND RESTROOM MODERNIZATION

FOR
SALINAS CITY ELEMENTARY SCHOOL DISTRICT

SALINAS, CALIFORNIA

DSA #01-119995



Prepared By

BELLI ARCHITECTURAL GROUP
235 Monterey Street, Suite B
Salinas, California
Telephone (831) 424-4620

Project No. 20035.

Date: JUNE 23, 2023

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LANDSCAPE TECHNICAL SPECS INCLUDED AT END OF DOCUMENT

SECTION 01010

SUMMARY OF WORK

PART 1 – GENERAL

1.01 DESCRIPTION: The Work includes the Remodel of:

SHERWOOD ELEMENTARY SCHOOL
New Drop-Off & Parking & Restroom Modernization
110 South Wood Street
Salinas, California 93905

in strict conformance with the Drawings and Specifications prepared by:

BELLI ARCHITECTURAL GROUP
235 Monterey Street, Suite B
Salinas, California 93901
Telephone (831) 424-4620

AND OTHER CONSULTANTS

1.02 WORK NOT IN THE CONTRACT: The term "NIC" means "Not In Contract". Following portions of the Work will be provided by the Owner under separate contract or other arrangement:

1. Portable furnishings and equipment.
2. All other items indicated or specified as NIC.

END OF SECTION

SECTION 01015

DEFINITIONS

PART 1 - GENERAL

1.01 DESCRIPTION: This Section covers additional definitions supplementary to those given in the Conditions of the Contract.

1.02 DEFINITIONS:

A. **Drawings**: Words such as "shown", "indicated", "detailed", "noted", "scheduled", or words of similar import shall mean that reference is made to the information on the Drawings unless stated otherwise.

B. **Owner**: Words such as Owner shall mean that of school district Representative unless stated otherwise.

C. **Actions of Architect**: Such words as "directed", "designated", "selected", and words of similar import shall mean that the direction, designation, selection, or similar action of the Architect is intended unless stated otherwise.

D. **Required**: The word "required" and words of similar import shall mean "required to complete the Work" and "required by the Architect", as is applicable to the context of the place where used, unless stated otherwise.

E. **Perform**: The word "perform" shall be understood to mean that the Contractor, at his expense, shall perform all the operations necessary to complete the Work or mentioned portions of the Work, including furnishing and installing materials as are indicated, specified, or required to complete such performance.

F. **Provide**: The term "provide" shall be understood to mean that the Contractor, at his expense, shall furnish and install the Work and the mentioned portion of the Work, complete and ready for the intended use. These definitions apply the same to future, present, and past tenses except "provided" may mean "contingent upon" where such is the context.

G. **Equal**: Terms such as "equal", "approved equal", "equivalent", and all terms of similar import shall be understood to be followed by the phrase "in the opinion of the Architect" unless stated otherwise.

H. **Approval**: Such words as "approved", "approval", "acceptable", "acceptance", or words of similar import shall mean that approval, acceptance, or similar import of the Architect is intended unless stated otherwise.

I. **Submit**: Such words as "submit", "submittal", "submission" and terms of similar import shall include the meaning of the phrase "submit to the Architect for his approval" unless otherwise stated.

J. **Expense**: Such terms as "at no extra cost to Owner", "with no extra compensation to Contractor", "at Contractor's expense", or phrases of similar import shall be understood to mean that the Contractor shall perform or provide the operation or Work with no increase to the Contract Sum stated in the Agreement.

K. **Fees and Charges**: To the extent indicated or specified, Contractor shall secure the permits, governmental authorizations, licenses, inspections, and all similar requirements and shall pay all costs relating thereto no matter how such costs are defined by the political subdivision, public authorities or agencies, public utilities, telephone company, special district, quasi-governmental entity, or other agency involved.

L. **Language**: Specifications are written in a modified brief style consistent with clarity. Generally, the words "the", "shall", "will" and "all" are not stated. Words requiring an action or performance, such as "perform", "provide", "erect", "install", "furnish", "connect", "test", "coordinate", and words and phrases of similar import, shall be understood to be preceded by the phrase "The Contractor shall" unless otherwise stated. The requirements indicated and specified apply to all Work of the same kind, class, and type, even though the word "all" is not stated.

M. **Titling and Arrangement**: Article, Paragraph, and Subparagraph titles and other identifications of subject matter in the Specifications are intended as an aid in locating and recognizing various requirements in the Specifications. Except where titling forms a part of the text, such as beginning words of a sentence or where the title establishes the subject, the titles are subordinate to and do not define, limit, or otherwise restrict the Specification text. Underlining or capitalizing of any words in the text does not signify or mean that such words convey special or unique meanings having precedence over any other part of the Contract Documents. Specification text shall govern over titling and shall be understood to be and interpreted as a whole. The order of Articles, Paragraphs, Subparagraphs, and Sub-subparagraphs in the Specifications text is defined by the sequence of indentations.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION

SECTION 01017

OWNER-FURNISHED ITEMS

PART 1 - GENERAL

1.01 DESCRIPTION: This Section covers the general requirements for Owner-furnished Contractor-installed (OFCI) equipment.

1.02 CONDITIONS: In every case, the Contractor shall be responsible for the correct and properly located installation of the OFCI equipment in accordance with the various manufacturers specifications and instructions.

A. **Conflicts**: Where a conflict occurs between requirements for OFCI equipment and the actual field conditions, Contractor shall not install the affected equipment until the conflict is resolved. No extra payment will be made to Contractor for correction of improper installation of equipment when reasonably adequate data and instructions for installation were furnished by Project Manager/Owner or various equipment manufacturers.

B. **Installation of OFCI Equipment** shall be complete in every detail, with each item accurately and correctly placed, connected, and tested.

C. **Delivery**: OFCI equipment will be delivered to the site of the Work. Contractor shall receive and unload the equipment, place in covered storage or the enclosed building, and be responsible therefore after delivery. Equipment that is damaged or abused during storage or installation operations shall be repaired, replaced, or otherwise made good to the Architect's/Owner's satisfaction at the Contractor's expense.

D. **Inspection of Delivered Equipment**: Within 10 working days after delivery of the OFCI equipment, Contractor shall open and uncrate the equipment for inspection. The Owner's representative and Contractor shall inspect each item and maintain a written record of all damage, missing parts, and other defects disclosed, all of which will be made good by the Architect's/Owner. After the inspection, Contractor shall be solely responsible for the equipment as specified above.

E. **Templates furnished** by the various equipment manufacturer's shall be kept at the site for reference and stored readily available to both the Architect's/Owner. Deviations from manufacturers' templates will not be approved.

F. **Additional Information**: The Contractor may request and receive from the Owner any necessary additional information, specifications, templates, and the like from any of the manufacturers of the OFCI equipment. Contractor may request a manufacturer's representative to supervise the installation of OFCI equipment items, but at no extra cost to Owner.

PARTS 2 - PRODUCTS

2.01 OFCI EQUIPMENT:

A. **Equipment List**: The list of OFCI equipment is shown on the Drawings or as provided by the Owner. Finish hardware is one item that the Owner shall provide to Contractor for installation, other shall be provided to Contractor by Architect or Owner.

B. **Installation Materials**: The Contractor shall provide the attachments, fittings, fasteners, connectors, and the like that are necessary for the installations but not regularly furnished by the equipment manufacturers, types as approved.

PART 3 - EXECUTION

3.01 INSTALLATION: In accordance with each equipment manufacturer's specifications, templates, and information, including the necessary assembling of components or sub-assemblies.

3.02 TESTS: The Contractor shall operate and test each item of OFCI equipment after installation. Should malfunctions occur through no fault of the Contractor, the Owner will make the defect good; otherwise, the Contractor shall effect all the necessary corrections so the equipment operates properly and as intended, at his expense.

END OF SECTION

SECTION 01025

SCHEDULE OF VALUES

PART 1 - GENERAL

1.01 DESCRIPTION: General Conditions and this Section cover schedule of values, supplementary to those given in the Conditions of the Contract.

1.02 SCHEDULE OF VALUES:

A. **Submit to Owner** for approval within 2 days of award of Contract, on the Owner Payment Request Form a breakdown to the total contract price showing the value assigned to each part of the work. List items in accordance with the specifications index.

B. **Support Values** given with data substantiating their correctness upon Owner's request.

C. **Use Schedule of Values** for Contractor's application for payment.

1.03 FORM OF SUBMITTAL: The form of Application for Payment shall be AIA G702 form acceptable to Owner. Use Table of Contents of this Specification for format and for listing costs of work specified in Specification Divisions 1 through 16 inclusive. Identify each line item using number and title as listed in the Table of Contents of these Specifications.

1.04 PREPARING SCHEDULE OF VALUES:

A. **Itemize Separate Line Item Cost** for each of the following general cost items:

1. Performance and payment bonds.
2. Field supervision and layout.
3. Temporary facilities and controls.
4. Allowances or budget for unforeseen or anticipated costs.

B. **Itemize Separate Line Cost** for work required by each Section of the Specifications.

C. **Break Down** installed costs into:

1. Delivered cost of product, with taxes paid.
2. Total installed cost, with overhead and profit.

D. **For Each Line Item** which has installed value of more than amount stated in General Conditions, break down cost to list major products or operations under each item.

E. Round Off Figures to nearest dollar.

1.05 REVIEW AND RESUBMITTAL: After review by Architect and Owner, revise and resubmit schedule (and schedule of material values) as required. Resubmit revised schedule in same manner.

END OF SECTION

SECTION 01041

PROJECT COORDINATION

PART 1 - GENERAL

1.01 DESCRIPTION: Division 1 and this Section cover project coordination, supplementary to those given in the Conditions of the Contract.

1.02 CONTRACTOR'S RESPONSIBILITIES: Be responsible for all project coordination, including coordination of separate contracts assigned to him. Coordinate work of all Subcontractors. Establish on-site lines of authority and communication. Schedule and conduct progress meetings with Owner, Architect's other concerned parties. Provide and maintain a sufficient crew of foremen necessary to execute work and to meet the required completion date.

1.03 ERRORS, OMISSIONS AND DISCREPANCIES: The General Conditions of the Contract impose a responsibility on the Contractor to carefully study and compare the Contract Documents, and to promptly report any error, inconsistency or omission he may discover, to Owner and Architect.

A. **The Contract Documents** have been reviewed by Architect, and are believed to be reasonably free from errors, omissions, conflicts and inconsistencies. To identify any problems that may remain in the Contract Documents, and to expedite their resolution, the Contractor shall follow the review and coordination procedures described herein.

B. **The Contractor** shall require each Subcontractor to read and comply with the requirements of this Section. Compliance with these procedures does not obligate the Contractor, or his Subcontractors, to correct the problems that are identified without written instructions from the Owner.

STATEMENT OF COORDINATION

TO: SALINAS CITY ELEMENTARY SCHOOL DISTRICT
SHERWOOD ELEMENTARY SCHOOL
SALINAS, CALIFORNIA

PROJECT:
LOCATION:

DIVISION OF WORK: _____
Section No. Description

The Undersigned declares that he has review the Contract Drawings, all Addenda, has read and understands the requirements of the General and Supplementary Conditions; the technical Sections of the Specifications describing work categories for which the undersigned is directly responsible; and each of the related Sections listed which include requirements for cooperation, coordination or compliance with portions of the referenced Sections.

The Undersigned further declares exception as may be noted, that he has no objections to the materials, methods, conditions and details of their installation and their relationship to the work of other trades; that the materials and methods of their installation are appropriate for the purpose established by the Contract Documents; in accordance with applicable codes; and that this can be accomplished in a workmanlike manner and complete and functional without additional expense to Owner.

EXCEPTIONS:
(State "NO EXCEPTIONS" or list exceptions, attaching supplementary material necessary)

_____
Signed by Contractor, Title Date

_____
Company Name

_____
Signed by Subcontractor, Title Date

_____
Company Name

COMPANY:

BASE BID COST BREAKDOWN: (For information only--Award of this contract will be aggregate of all components formulating the Total Base Bid).

DIVISION 01 General Requirements . . . . . Dollars ($_____)
- Provide a Detailed Breakdown

DIVISION 02 Site Work. . . . . Dollars ($_____)

DIVISION 03 Concrete . . . . . Dollars ($_____)

DIVISION 04 Masonry. . . . . Dollars ($_____)

DIVISION 05 Metals . . . . . Dollars ($_____)

DIVISION 06 Carpentry. . . . . Dollars ($_____)

DIVISION 07 Moisture . . . . . Dollars ($_____)

DIVISION 08 Doors and Windows. . . . . Dollars ($_____)

DIVISION 09 Finishes . . . . . Dollars ($_____)

DIVISION 10 Specialties. . . . . Dollars ($_____)

DIVISION 11 Equipment. . . . . Dollars ($_____)

DIVISION 12 Furnishings. . . . . Dollars ($_____)

DIVISION 13 Special Conditions . . . . . Dollars ($_____)

DIVISION 14 Conveying Systems. . . . . Dollars ($_____)

DIVISION 15 Mechanical . . . . . Dollars ($_____)

DIVISION 16 Electrical . . . . . Dollars ($_____)

Overhead and Profit. . . . . Dollars ($_____)

Base Bid Total . . . . . Dollars ($_____)

SECTION 01048

CONTRACTOR'S REQUESTS FOR INFORMATION

PART 1 - GENERAL

1.01 DESCRIPTION: All other sections of Division 1 apply to this Section. This Section covers the general requirements for Contractor's Requests for Information, and pertains to all portions of the contract documents.

A. Related Work Specified Elsewhere:

1. Project Meetings - Section 01200
2. Submittals - Section 01300

1.02 DEFINITION: Request for Information, a document submitted by the Contractor requesting clarification of a portion of the contract documents, hereinafter referred to as RFI.

1.03 CONTRACTOR'S REQUESTS FOR INFORMATION:

A. When the Contractor is unable to determine from the contract documents, the exact material, process or system to be installed, the Architect shall be requested to make a clarification of the indeterminate item. Wherever possible, such clarification shall be requested at the next appropriate project meeting, with the response entered into the meeting minutes. When clarification at the meeting is not possible, either because of the urgency of the need, or the complexity of the item, Contractor shall prepare and submit an RFI to the Architect.

B. Contractor shall endeavor to keep the number of RFI's to a minimum. In the event that the process becomes unwieldy, in the opinion of the Architect, because of the number and frequency of RFI's submitted, the Architect may require the Contractor to abandon the process and submit all requests as either submittals, substitutions or requests for change.

C. RFI's shall be submitted on a form provided by, or approved by, the Architect. Forms shall be completely filled in, and if prepared by hand, shall be fully legible after copying by xerographic process. Each page of attachments to RFI's shall bear the RFI number in the lower right corner.

D. RFI's from subcontractors or material suppliers shall be submitted through, reviewed by, and signed by the Contractor prior to submittal to the Architect.

E. Contractor shall carefully study the contract documents to assure that the requested information is not available therein. RFI's which request information available in the contract documents will not be answered by the Architect.

F. **In all cases where RFI's** are issued to request clarification of coordination issues, for example, pipe and duct routing, clearances, specific locations of work shown diagrammatically, and similar items, the Contractor shall fully lay out a suggested solution using drawings or sketches drawn to scale, and submit same with the RFI. RFI's which fail to include a suggested solution will not be answered.

G. **RFI's shall not be** used for the following purposes:

1. To request approval of submittals
2. To request approval of substitutions,
3. To request changes which entail additional cost or credit.
4. To differentiate methods of performing work than those drawn and specified.

H. **In the event the Contractor** believes that a clarification by the Architect results in additional cost, Contractor shall not proceed with the work indicated by the RFI until a change order is prepared and approved. Answered RFI's shall not be construed as approval to perform extra work.

I. **Unanswered RFI's** will be returned with a stamp or notation: Not Reviewed.

J. **Contractor shall prepare** and maintain a log of RFI's, and at any time requested by the Architect, Contractor shall furnish copies of the log showing all outstanding RFI's. Contractor shall note all unanswered RFI's in the log.

K. **Contractor shall allow** for 7 days review and response time for RFI's.

PART 2 – PRODUCTS - Not applicable to this Section.

PART 3 – EXECUTION - Not applicable to this Section.

END OF SECTION

SECTION 01060

REGULATORY REQUIREMENTS

PART 1 - GENERAL

1.01 DESCRIPTION: This Section covers general requirements for codes and standards pertaining to the Work and is supplementary to the codes and standards mentioned or referenced elsewhere in the Contract Documents.

1.02 CODES AND STANDARDS:

A. **Requirements of Regulatory Agencies**: All pertaining statutes, ordinances, laws, rules, codes, regulations, standards, and lawful orders of public authorities having jurisdiction of the Work of this Contract are hereby incorporated into the Contract Documents the same as if repeated in full herein and are intended wherever reference is made in either the singular or plural to Code or Building Code except as otherwise specified, including, but not limited to, those in the following listing. Contractor shall make available at the site such copies of the listed documents applicable to the Work as Architect or Owner may request, including mentioned portions of the California Code of Regulations (CCR).

1. 2019 California Building Code.
2. Title 8 CCR, Industrial Relations, including Chapter 4, Div. of Industrial Safety, Safety Orders (CAL/OSHA).
3. Title 19 CCR, Public Safety.
4. Title 22 CCR, Social Security.
5. Title 24 CCR, Building Standards
6. 2019 California Mechanical Code.
7. 2019 California Plumbing Code.
8. 2019 California Fire Code.
9. 2019 California Electrical Code.
10. 2005 California Energy Code
11. Salinas Municipal Code
12. Salinas Zoning Code
13. Americans with Disabilities Act (ADA)
14. Fair Housing Act Design Manual (FHADM)
15. Local and State Elevator Codes.
16. UL Fire Resistant Directory – Volumes 1 and 2
17. National Fire Protection Association - latest edition.
18. State and Local Public Health Codes - latest edition.
19. All other laws, regulations, rules, orders, codes, and ordinances specified in other Sections of these Specifications or bearing on the Work.

END OF SECTION

SECTION 01070

ABBREVIATIONS

PART 1 - GENERAL

1.01 DESCRIPTION: This Section covers abbreviations for the documents mentioned or referenced elsewhere in the Contract Documents, and language abbreviations used in the text of the Specifications. Abbreviations in Drawings and Specifications shall be interpreted according to recognized and well-known technical, industry, or trade meanings.

1.02 TRADE ABBREVIATIONS include but are not limited to the following:

AA	Aluminum Association
AABC	Associated Air Balance Council
AAMA	Architectural Aluminum Manufacturers Association
AASHTO	American Association of State Highway and Traffic Officials
ACI	American Concrete Institute
ADC	Air Diffusion Council
AEIC	Association of Edison Illuminating Companies
AFBMA	Anti-Friction Bearing Manufacturers Association
AFI	Air Filter Institute
AGA	American Gas Association
AGMA	American Gear Manufacturers Association
AIA	American Institute of Architects
AIMA	Acoustical and Insulating Materials Association
AISC	American Institute of Steel Construction, Inc.
AISI	American Iron and Steel Institute
AMCA	Air Moving and Conditioning Association, Inc.
ANSI	American National Standards Institute
ARI	Air Conditioning and Refrigeration Institute
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASSE	American Society of Sanitary Engineers
ASTM	American Society for Testing and Materials
AWPA	American Wood Preservers Association
AWPB	American Wood Preservers Bureau
AWPI	American Wood Preservers Institute
AWS	American Welding Society
AWWA	American Water Works Association
CBM	Certified Ballast Manufacturers

CCR	California Code of Regulations (Formerly CAC)
CDA	Copper Development Association
CGA	Compressed Gas Association
CISPI	Cast-Iron Soil Pipe Institute
CS	Commercial Standard, US Department of Commerce
CTI	Cooling Tower Institute
DEMA	Diesel Engine Manufacturers Association
DOD-	Department of Defense (leading symbol)
EIA	Electronic Industries Association
ETL	Electrical Testing Laboratories
FAA	Federal Aviation Administration
FCC	Federal Communications Commission
Fed Spec	Federal Specification or Standard
FIA	Factory Insurance Association
FM	Factory Mutual
HI	Hydraulic Institute
IEEE	Institute of Electrical and Electronic Engineers
IES	Illuminating Engineering Society
IPCEA	Insulated Power Cable Engineers Association
ISO	International Standards Organization
MIL	Military Specification or Standard (leading symbol)
MSS	Manufacturers Standardization Society
NAAMM	National Association of Architectural Metal Manufacturers
NAFM	National Association of Fan Manufacturers
NBS	National Bureau of Standards
NEBB	National Environmental Balancing Bureau
NEC	National Electrical Code
NEMA	National Electrical Manufacturers Association
NFC	National Fire Code
NFPA	National Fire Protection Association
NSF	National Sanitation Foundation
NWWDA	National Wood Window and Door Association
OSCI	Owner-Supplied Contractor Installed
OSA	Office of the State Architect
DSA	Division of the State Architect
PDI	Plumbing and Drainage Institute
PS	Product Standard, US Department of Commerce
REA	Rural Electrification Administration
RIS	Redwood Inspection Service
SAE	Society of Automotive Engineers
SDI	Steel Door Institute
SFM	State Fire Marshal
SMACNA	Sheet Metal and Air Conditioning Contractors

	National Association
SSPC	Steel Structures Painting Council
UL	Underwriters' Laboratories, Inc.
WCLIB	West Coast Lumber Inspection Bureau
WI	Woodwork Institute
WWPA	Western Wood Products Association

1.03 TEXT ABBREVIATIONS include but are not limited to the following:

AMP or amp	Ampere
CFM or cfm	Cubic feet per minute
FPM or fpm	Feet per minute
FPS or fps	Feet per second
GPM or gpm	Gallons per minute
Kip or kip	Thousand pounds
Ksi or ksi	Thousand pounds per square inch
Ksf or ksf	Thousand pounds per square foot
KV or kv	Kilovolt
KVA or kva	Kilovolt amperes
KW or kw	Kilowatt
KWH or kwh	Kilowatt hour
LF or lf	Linear foot
MPH or mph	Miles per hour
PCF or pcf	Pounds per cubic foot
PSF or psf	Pounds per square foot
PSI or psi	Pounds per square inch
SF or sf	Square foot
SY or sy	Square yard

PART 2 - PRODUCTS (Not applicable to this Section)

PART 3 - EXECUTION (Not applicable to this Section)

END OF SECTION

SECTION 01090

REFERENCE STANDARDS

PART 1 - GENERAL

1.01 DESCRIPTION: This Section covers the general requirements for reference standards pertaining to the Work and is supplementary to the reference standards mentioned or referenced elsewhere in the Contract Documents.

1.02 REFERENCE AND STANDARD TYPE SPECIFICATIONS: Specifying by reference to reference and standard type specification documents or to another portion of the Contract Documents shall be the same as if the referenced document or portion referred to were exactly repeated at the place where reference is made. In case of conflict between the requirements of regulatory agencies and the referenced reference and standard type specification documents, Contractor shall conform to the most restrictive requirement if such conformance is legal. The reference or standard type specification documents shall be the current issue at the time the Construction Documents is completed unless otherwise specified. Contractor shall make available at the site such copies of the reference or standard type specification documents as Architect or Owner may request. Should specified reference standards conflict with Contract Documents request clarification from Architect before proceeding.

END OF SECTION

SECTION 01200

PROJECT MEETINGS

PART 1 - GENERAL

1.01 DESCRIPTION: This Section covers general requirements for project meetings.

PART 2 - PRODUCTS (Not Applicable to This Section)

PART 3 - EXECUTION

3.01 PROJECT MEETINGS:

A. **Attendees**: Unless otherwise specified or required by Owner, all meetings shall be attended by Owner, Owner's Representative (Construction/Project Manager), Architect, Contractor, and the Contractor's Superintendent. Subcontractors may attend the meetings when involved in matters to be discussed or resolved but only when requested by the Owner, Construction Manager, Architect, or Contractor.

B. **Meeting Records**: The Contractor will record minutes of each meeting and furnish copies within a reasonable time (3 working days) thereafter to the Owner, Owner's Representative (Project Manager), Architect, Contractor, and other attendees. Unless written objection to the contents of such meeting minutes is received by Architect within 10 days after presentation, it will be understood and agreed that the minutes are a true and complete record of the meeting.

C. **Meeting Schedule**: Dates, times, and locations for the various meetings shall be agreed upon and recorded at preconstruction conference. Thereafter, changes to schedule shall be agreed between Owner, Owner's Representative (Project Manager), Architect and Contractor, with appropriate written notice to all parties involved.

3.02 PRECONSTRUCTION CONFERENCE:

A. **General**: The Contractor will schedule a preconstruction conference prior to issuance of Notice to Proceed, a preconstruction conference shall be held at location, date, and time designated by the Owner. In addition to attendees named herein, the meeting shall be attended by representatives of regulatory agencies having jurisdiction, if required, and such other persons the Owner may designate.

B. **Agenda**: The Contractor will prepare an agenda for matters to be discussed or resolved and instructions and information to be furnished to or given by Contractor at preconstruction conference include but are not limited to:

1. Schedule of progress meetings.
2. Progress schedule and schedule of values submitted by Contractor.
3. Communication procedures between the parties.
4. Names and titles of all persons authorized by Contractor to represent and execute documents for him, with samples of all authorized signatures.
5. The names, addresses, and telephone numbers of all those authorized by the Contractor to act for him in emergencies.
6. Construction permit requirements, procedures, and posting.
7. Public notice of starting Work.
8. Forms and procedures for Contractor's submittals.
9. Change Order forms and procedures.
10. Payment application forms and procedures and the revised progress schedule reports to accompany the applications.
11. Contractor's designation of his organization's accident prevention member and his qualifications if other than the Superintendent.
12. Contractor's provisions for barricades, traffic control, utilities, sanitary facilities, and other temporary facilities and controls.
13. Consultants and professionals employed by Owner and their duties.
14. Construction surveyor and initiation of surveying services.
15. Testing Laboratory or Agency, and testing procedures.
16. Procedures for payroll and labor cost reporting by the Contractor.
17. Procedures to ensure nondiscrimination in employment on and for the Work.
18. Warranties and guarantees.
19. Other administrative and general matters as needed.

3.03 CONSTRUCTION PROGRESS MEETINGS: Progress meetings shall be held according to the agreed schedule. All matters bearing on progress and performance of the Work since preceding progress meeting shall be discussed and resolved including, without limitation, any previously unresolved matters, deficiencies in the Work or the methods being employed for the Work, and problems, difficulties, or delays which may be encountered.

3.04 SPECIAL MEETINGS: On appropriate notice to other parties, special meetings may be called by the Owner, Owner's Representative (Project Manager), Architect, or Contractor. Special meetings will be held where and when designated by the Owner.

3.05 POSTCONSTRUCTION CONFERENCE: A postconstruction conference shall be held prior to final inspection of the Work to discuss and resolve all unsettled matters. Bonds and insurance to remain in force, and the other documents required to be submitted by the Contractor will be reviewed and any deficiencies determined. Schedule and procedures for final inspection and for correction of defects and deficiencies shall be agreed.

END OF SECTION

SECTION 01300

SUBMITTALS

PART 1 - GENERAL

1.01 DESCRIPTION: This Section covers the general requirements and procedures for submittals.

A. Submittal Requirements In This Section:

1. Schedule of submittals and transmittals.
2. Deviations.
3. Contractor's review and approval.
4. Corrections and resubmittals.
5. Review and approval.
6. Shop Drawings, Samples, and Product and Equipment Data.
7. Manufacturers' instructions.
8. Materials furnished under standard specifications.
9. Certificates.

B. Submittal Requirements Not In This Section:

1. Performance and payment bonds, insurance - Conditions of the Contract.
2. Record Drawings, manuals, and maintenance materials - Section 01700.
3. Warranties and guarantees - Section 01740.

1.02 GENERAL SUBMITTAL REQUIREMENTS: Submit to the Architect all submittals required herein, under other Sections, or by Modifications except as otherwise indicated, specified, or directed. Submittals shall be correctly prepared, identified, and transmitted as specified herein or as otherwise directed. Prepare submittals according to the requirements herein and as may be specified in other Sections.

A. Conformance: Do not purchase or commence any Work covered by a submittal until the pertaining submittal is approved. Work shall conform to approved submittals and all other requirements of Contract Documents unless revised by Modification, in which case submit revised submittals as directed or required at no extra cost to the Owner. Do not start related Work affected by Work covered in submittals until applicable submittals are approved, especially where machinery, equipment, piping, conduit, and required arrangements and clearances are involved.

B. Schedule of Submittals: Submit within 10 days of the Award of the Contract, the Progress Schedule submitted by the Contractor shall include an itemized listing of all required submittals with a scheduled date for each submittal, and shall allow reasonable times for review by the Architect and various Consultants plus time for delivery or return. Contractor shall consult with Architect

regarding major and/or large submittals and time periods required by the Architect for the reviews prior to preparation of the Progress Schedule. Extension of the Contract Time will not be granted because of the Contractor's failure to make timely and correctly prepared and transmitted submittals with an adequate and approved time allowance for the checking and review periods.

C. **Transmittals**: Deliver submittals with a dated and sequence numbered transmittal letter typed on Contractor's letterhead, noted as to the initial or resubmittal status, and describing the submittal contents. Submittals are not acceptable directly from Subcontractors, suppliers, or manufacturers. In each transmittal state the Drawing numbers and Specification Section, Articles, and Paragraphs to which the submittal pertains and identify accompanying data, catalogs, drawings, sketches, and brochures in the same manner.

D. **Deviations**: Notify the Architect in the transmittals of all deviations from the requirements of the Contract Documents. Fully describe each deviation and all other changes required to correlate the Work including the related Work. State in writing all variations in costs caused by each deviation and the Contractor's assumption of costs for the deviation and of all related costs if any deviation is approved.

E. **Contractor's Review and Approval**: Every submittal upon which proper execution of the Work is dependent shall bear the Contractor's review and approval stamp, dated and signed by Contractor in every case, certifying that Contractor (a) has reviewed, checked, and approved the submittal and has coordinated the submittal contents with requirements of the Work and Contract Documents including related Work, (b) determined and verified quantities, field measurements, construction criteria, materials, equipment, catalog numbers and identifications, and similar data, or will do so, and (c) states that Work illustrated or described in the submittal is recommended by Contractor and that Contractor's warranty will fully apply thereto.

F. **Corrections and Resubmittals**: Contractor shall make corrections required by the Architect, resubmit corrected submittals until they are approved, shall direct specific attention in writing to all revisions other than corrections called for on previous submittals, and shall state in writing all changes in costs for such revisions and assumption of all costs for revisions and related changes the same as is required for deviations in Paragraph "Deviations".

G. **Check of Returned Submittals**: Contractor shall check and review the submittals returned for correction and ascertain whether the required corrections result in extra cost above that included in the Contract, and shall give written notice to the Architect within 5 working days if, in the Contractor's opinion, extra costs result from corrections. The Contractor's failure to give such written notice or the starting of any Work covered by a returned submittal constitutes a waiver by the Contractor of claims for extra costs resulting from required corrections.

H. **Review And Approval Of Submittals By The Architect**: Submittals will be reviewed with reasonable promptness, but only for conformance with the design concept of the Project and with the information indicated on the Drawings and stated in the Specifications. Approval of a separate item as such will not indicate approval of the assembly in which the item functions. Approval of submittals shall not relieve the Contractor of responsibility for any deviation from the requirements of the Contract Documents or for any revision in resubmittals unless Contractor has given written notice of such deviation or revision at the time of submission or resubmission and written approval has been given to the specific deviation or revision, nor shall approval relieve the Contractor of responsibility for errors or omissions in the submittals or for the accuracy of dimensions and quantities, the adequacy of connections, and the proper and acceptable fitting, execution, functioning, and completion of the Work.

I. **Incomplete Or Inadequate Submittals**, including those not correctly transmitted, titled, and identified, or not bearing Contractor's review and approval stamp, will be returned to the Contractor without review.

J. **Interrelated Submittals**: Except where the preparation of submittal information is dependent upon the approval of any prior submittal, all submittals pertaining to the same class or portion of the Work shall be submitted simultaneously.

K. **Expense**: All cost for the preparation, correction, delivery, and return of the submittals shall be borne by Contractor.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.01 SHOP DRAWINGS: Prepare each submittal complete including all dimensions, design criteria, materials, connections, bases, foundations, anchors, and the like, and further including such technical and performance data as is necessary to confirm the information in the Shop Drawings. Prepare Shop Drawings of same size as the Drawings or on 8-l/2" by 11" 3-hole punched vellum sheets suitable for ozalid or Xerox reproduction. **Copies of the Contract Drawings marked to show Shop Drawing information are not acceptable and will be returned to the Contractor unreviewed**. Each Shop Drawing shall have an adequate title block showing the following identification:

Name and address of the Work.
Name and address of the Contractor.
Name and address of the Subcontractor, Subsubcontractor, manufacturer, supplier, or distributor, as applicable.
Name and address of the Architect.
Date, scale of drawings, and identification number.
Contractor's review and approval stamp, dated and signed.

A. **Initial and Resubmittals**: Submit Shop Drawings in sets consisting of one sepia reproducible and four blue-line prints.

B. **Correction and Approval of Shop Drawings**: The Architect will mark corrections, notations, or approval on the reproducible sepia transparencies and return them to the Contractor. Resubmit in same manner if Shop Drawings are not approved.

C. **Final Distribution**: Furnish and distribute prints of approved Shop Drawings as required for performance of the Work.

3.02 SAMPLES: Unless otherwise specified, each submittal shall include (3) three complete sets of Samples. Two sets of approved Samples and all disapproved Samples will be returned to Contractor. Samples of value retained by Architect will be returned to Contractor after completion of the Work if the Contractor's first transmittal for the Sample requests its return. Approved Samples of items returned to Contractor may be installed in the Work if the location is recorded and the Samples bear temporary identification as such.

3.03 PRODUCT AND EQUIPMENT DATA SUBMITTALS:

A. **Product Data** shall include materials lists, catalogs, brochures, performance and technical data, service history, characteristics, and like information to fully describe the products covered by the submittal.

1. Submittal Preparation. Bind submittal copies with sturdy labeled covers and include a typed index listing the contents. Loose or unbound submittals will be returned unreviewed. For each item listed, include the manufacturer's name and address, the trade or brand name, all conditions of manufacturer's guarantee and warranty, information to fully describe each item, and supplementary information as may be required for approval. Mark clearly and completely cuts, brochures, and data to indicate the items proposed and the intended use.
2. Product Data Submittals. Unless otherwise specified, every submittal shall include four bound copies. One copy will be returned to the

Contractor marked to show the required corrections or approval. If corrections are required, the final submittal shall include four bound corrected copies.

B. **Equipment Data**: Submit complete technical, performance, and catalog information for every item of mechanical and electrical equipment and machinery proposed for installation in the Work, bound, indexed, and containing information and data as required in Paragraph "Product Data" above. Include information on performance and operating curves, ratings, capacities, characteristics, power efficiencies, manufacturers' standard guarantees and warranties with the terms and conditions fully described, and all other information to fully illustrate and describe the items as may be specified or required for approval. Submit in sets which cover complete systems or functioning units. Unless otherwise specified, submittals shall be as specified in Subparagraph "Product Data Submittals". If applicable, incorporate the equipment data into and submit with the manuals specified under Section 01700.

3.04 MANUFACTURERS' INSTRUCTIONS: Submit manufacturers' installation instructions and directions for materials specified to be installed in accordance with such instructions to demonstrate the adequacy of the instructions. Furnish copies to all trades involved.

3.05 MATERIALS FURNISHED UNDER STANDARD SPECIFICATIONS: For materials specified by reference to standard or reference type specifications, prepare and submit for approval a list of such materials by manufacturer's names and identifications to the extent requested by the Architect or Owner.

3.06 CERTIFICATES: Deliver all certificates to Architect. Each certificate required under the Contract Documents shall be signed by the individual, officer, or the agent lawfully authorized to execute the certificate, and such authority shall be cited in the certificate by title, description, or other acceptable evidence. All certificates shall be sworn and notarized as to the correctness and validity of the contents, and copies shall be notarized to be true copies.

END OF SECTION

SECTION 01400

QUALITY CONTROL

PART 1 - GENERAL

1.01 DESCRIPTION: This Section covers general requirements for quality control of the Work, including testing and inspection procedures.

A. Requirements In This Section:

1. Testing laboratory or agency.
2. Geotechnical (Soils or Foundation) Engineer.
3. Coordination of tests and inspections.
4. Test costs and reports.
5. Inspections, continuous and special.
6. Contractor-furnished assistance.
7. Verification of conditions.

B. Requirements Not In This Section:

1. Specific test procedures to be performed in accordance with this Section.
2. Testing of electrical work.
3. Testing of materials specified to be tested by other agencies under other Section.

1.02 TESTING AND INSPECTION REQUIREMENTS:

A. Tests: The Owner will select an independent testing laboratory approved by DSA to conduct the tests. Selection of the material required to be tested shall be by the laboratory or the Owner's Representative and not by the Contractor. The Contractor shall notify the Owner's Representative a sufficient time in advance of the manufacture of the material to be supplied by him under the Contract Documents, which must be terms of the Contract to be tested, in order that the Owner may arrange for the testing of same at the source of supply.

B. Testing Reports: Refer to paragraph 1.05 Test Reports for parties to be sent copies of all test reports. Such reports shall include all the tests made, regardless of whether such tests indicate that the material is satisfactory or unsatisfactory. Samples taken but not tested shall also be reported. Records of special sampling operations as required shall also be reported. The reports shall show that the material or materials were sampled and tested in accordance with the requirements of Title 24 and with the approved specifications. Test reports shall show the specified design strength. They shall also state definitely whether or not the material or materials tested comply with requirements.

C. **Verification of Test Reports**: Each testing agency shall submit to the Division of the State Architect a verified report in duplicate covering all the tests which are required to be made by that agency during the process of the project. Such reports shall be furnished each time that work on the project is suspended, covering the tests up to that time, and at the completion of the project, covering all tests.

D. **Inspection by the Owner**: The Owner and his representative shall at all times have access for the purpose of inspection to all parts of the work and to the shops wherein the work is in preparation, and the Contractor shall at all times maintain proper facilities and provide safe access for such inspection.

E. **Testing and Inspection**: The Owner shall have the right to reject materials and workmanship which are defective, or to require their correction. Rejected workmanship shall be satisfactorily corrected and rejected materials shall be removed from the premises without charge to the Owner. If the Contractor does not correct such rejected work within a reasonable time, fixed by written notice, the Owner may correct same and charge the expanse to the Contractor. Should it be considered necessary or advisable by the Owner at any time before final acceptance of the entire work to make an examination of the work already completed by removing or tearing out the same, the Contractor shall on request promptly furnish all necessary facilities, labor and materials. If such work is found to be defective in any respect due to the fault of the Contractor or his subcontractor, he shall defray all expenses of such examinations and of satisfactory reconstruction. If, however, such work is found to meet the requirements of the Contract, the additional cost of labor and material necessarily involved in the examination and replacement shall be allowed the Contractor.

F. **Inspector – Owner's**: An Inspector employed by the Owner in accordance with the requirements of the California Code of Regulations, Title 24 will be assigned to the work. His duties are specifically defined in Title 24, Part I, Sec. 4-342. The work of construction in all stages of progress shall be subject to the personal continuous observation of the inspector. He shall have free access to any or all parts of the work at any time. The Contractor shall furnish the Inspector reasonable facilities for obtaining such information as may be necessary to keep him fully informed respecting the progress and manner of the work and the character of the materials. Inspection of the work shall not relieve the Contractor from any obligations to fulfill this Contract.

G. **Soils or Foundation Engineer** will be the registered professional Geotechnical Engineer employed and paid by Owner.

H. **Disqualified Material**: Any material shipped or delivered to the site by the Contractor from the source of supply prior to having satisfactorily passed the required testing and inspection, or prior to the receipt of a notice from the Architect/Owner that such testing and inspection will not be required, shall not be incorporated in the Work.

1.03 COORDINATION OF TESTS AND INSPECTIONS: Contractor shall initiate and coordinate testing and inspections required by Contract Documents and public authorities having jurisdiction of the Work.

A. **Notification**: Contractor shall notify the Owner a sufficient time in advance of the manufacture of material to be supplied by him which, by requirements of the Contract Documents, must be tested at the source of supply in order that the Owner may arrange for the testing.

1.04 TEST COSTS: Owner will pay for testing performed by Testing Laboratory except Contractor shall reimburse the Owner for retesting costs caused by failure of materials to pass initial tests. Contractor shall arrange and pay for all other testing.

1.05 TEST REPORTS: Furnish copies of each test result report, signed and certified by the Testing Laboratory supervising engineer, as follows:

	Copies
Owner	1
Division of the State Architect	1
Architect	1
Structural Engineer (structural test only)	1
Contractor	2

1.06 INSPECTIONS, CONTINUOUS AND SPECIAL:

A. **Inspections**, continuous and special, shall be performed by Registered Deputy or Special Inspectors (hereinafter referred to as the Inspector) as required by the Contract Documents and Building Code. During course of Work under inspection, each Inspector shall submit detailed reports relative to progress and condition of Work including variances from the Contract Documents, and stipulating dates, hours, and locations of the inspections.

B. **Inspection Costs**: Owner will employ Inspector and pay for required continuous and special inspections.

C. **Reimbursement of Inspection Costs**: The Contractor shall reimburse to the Owner all or any part, as the Owner may deem just and proper, of the actual excessive inspection costs incurred by the Owner due to any or all of the following:

1. Contractor's failure to complete the Work within the Contract Time stated in the Agreement, and any previously authorized extensions thereof.
2. Claims between separate contractors.
3. Covering of any of the Work before the required inspections or tests are performed.
4. Extra inspections required for Contractor's correction of defective Work.
5. Overtime costs for acceleration of Work done for Contractor's convenience.

D. **Approvals Required by Others**: If the laws, ordinances, rules, regulations, or orders of any public agency having jurisdiction require any of the Work to be specifically inspected, tested, or approved by some authority other than the Owner, Architect, or Contractor, the Contractor shall give all required notices and make all arrangements, shall deliver to the Architect the certificates of inspection, testing, or approval of such public agency, and shall pay all costs therefor unless otherwise provided in the Contract Documents.

1.07 CONTRACTOR-FURNISHED ASSISTANCE: Whenever requested, Contractor shall furnish access, facilities, and labor assistance as necessary for duties to be performed at the site by Testing Laboratory and Inspector including furnishing ladders, hoisting, temporary lighting and water supply, and like services.

1.08 VERIFICATION OF CONDITIONS: Prior to installation of any portion of the Work, the installing Contractor, Subcontractor, or Sub-subcontractor shall inspect the Work in place to receive the Work to be installed and arrange for correction of defects in the existing workmanship, material, or conditions that may adversely affect Work to be installed. Such inspections shall include test applications of the materials to be installed as required to establish the correct condition of surfaces involved. Installation of materials on Work in place constitutes acceptance by the installing Contractor, Subcontractor, or Sub-subcontractor of such Work in place as being in proper condition to receive the materials to be applied and waiver of claim that the Work in place is defective as pertains to warranty requirements, excluding unascertainable or concealed conditions. Where the Specifications require a material to be installed under the supervision or inspection of the material manufacturer or his representative, manufacturer or his representative also shall inspect the Work in place and issue a letter of approval to Architect.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.01 TESTS AND INSPECTIONS: Owner will pay for the following required testing and inspections except as stated otherwise for specific items. Sections referenced are from Current California Building Code, and CCR Title 24, with current Amendments.

A. **Wood (Chapter 23)**:

1. Materials:
   a. Sawn Lumber and Wood Structural Panels – 2303.1.1, 2303.1.4, 2304.7
   b. Glued Laminated Members – 2303.1.3
2. Wood Inspection:
   a. Wood Construction – 1704A.6
   b. Glued Laminated Construction – 1704A.6.2.1
   c. Timber Connectors – 1704A.6.3

B. Miscellaneous:

a. Miscellaneous tests and inspections shall be preformed when required by the inspector or structural engineer.

C. Mechanical:

a. Air balancing report.

END OF SECTION

SECTION 01500

CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

PART 1 - GENERAL

1.01 DESCRIPTION: This Section covers general requirements for construction facilities and temporary controls for the Work.

A. Work In This Section: Principal items include:

1. Temporary barricades.
2. Temporary storage facilities.
3. Temporary utility services.
4. Temporary heat.
5. Temporary facilities for Work in existing buildings.
6. Removal of temporary facilities.

1.02 GENERAL: Drawings indicate building site and related areas of Owner's property available for the Work. Keep areas orderly, free of hazards, and leave in clean condition acceptable to Architect, Owner, and governing public authorities.

PART 2 AND 3 - PRODUCTS AND EXECUTION

2.01 TEMPORARY BARRICADES: Provide solid or chain link fencing type barricades. Construct and relocate or alter as required by Architect, Code, or public authorities having jurisdiction. Paint solid barricades exposed to public view with 2 coats of paint in colors designated by Architect. Secure and pay for building and street use permits and inspections required by Code.

2.02 TEMPORARY STORAGE FACILITIES: Provide temporary storage facilities necessary to protect materials and equipment delivered to site from damage. Maintain sheds in a clean and sightly condition. Distribute all materials stored in permanent structures to prevent overloading of floors or structure. If on-site storage area is inadequate, arrange and pay for necessary off-site facilities.

2.03 UTILITY SERVICES: Send proper notices, make necessary arrangements, provide services required in care and maintenance of public utilities, and assume the responsibility concerning same for which Owner may be liable. Do all necessary enclosing or boxing in for protection of public utilities. Upon completion of the Work, remove enclosures, fill in openings in concrete or masonry with like materials, grout watertight, and leave in finished condition.

A. Water: Furnish and pay for all water required for the Work, with the necessary temporary piping or hose from source to points on the site where used. Furnish potable water from domestic source.

B. **Light and Power**: Furnish and pay for electric service required for the Work and provide temporary poles and overhead construction, transformers, meters, drops, wiring, panels, circuit and ground fault protection, and fittings for both light and power at locations required. Pay charges and fees for making the temporary service connections.

C. **Gas**: Furnish and pay for fuel gas required for the Work. Make the necessary arrangements and pay charges required by the serving utility company. Furnish temporary distribution piping as required.

2.04 TEMPORARY HEAT: Furnish and pay for heat, fuel, and services to protect the Work against injury from dampness and cold until final acceptance. Operate the heating system as necessary to maintain correct temperatures within building during finishing operations, with provision to vent obnoxious, flammable, or hazardous fumes to the exterior.

2.05 TEMPORARY FACILITIES FOR WORK IN EXISTING BUILDINGS:

A. **Noise and Dust Control Barriers**: Prior to start of Work, coordinate with Owner as to location for barriers to ensure that no interference is caused to use of occupied portions of buildings.

1. Barriers. To the extent indicated or directed, provide dustproof and sound deadening barriers between new Work areas and occupied portions of the existing facilities before Work is commenced. Construct barriers of 1/2" thick gypsum wallboard or rigid plastic partitions over steel studs. Seal joints in barriers and to existing work with a pressure sensitive masking tape. Maintain barriers in a clean, neat, dustproof and sound deadened condition until their need is fully satisfied and removal is approved or directed by Owner. Install doors with weatherstripping and locking hardware where directed by the Owner. Locate all barriers so as not to obstruct use of existing room doors, doors to existing stairways, or access to and through legal exitways.

B. **Temporary Exterior Closures**: Provide as required to maintain the weatherproof and watertight integrity of the existing facilities.

C. **Rolling Interior Scaffolds**: Equip rolling scaffolds with pneumatic tires and rubber bumpers to prevent damage to walls and finishes. Except where an entire corridor or space is made available for Contractor's exclusive use, fixed and rolling scaffolds shall occupy no more than one-half the width of the area, and shall not block doors and doorways in use by occupants. Protect floors with planks or similar material as required to prevent marring or damage.

D. **Control of Construction Water**: Provide impermeable floor coverings and suitable dams to prevent damage by the water used for the Work. Immediately clean up and remove all surplus water and water spilled in non-working areas.

2.06 REMOVAL OF TEMPORARY CONSTRUCTION: Remove all temporary facilities and other construction of temporary nature from site as soon as progress of the Work will permit in opinion of the Architect. When authorized, Contractor may move his facilities into designated areas of completed portions of the building. Upon completion of the Work, recondition and restore portions of site and building occupied by temporary facilities to acceptable condition.

END OF SECTION

SECTION 01600

MATERIAL AND EQUIPMENT

PART 1 - GENERAL

1.01 DESCRIPTION: This Section covers the general requirements for the materials and equipment for the Work. Specific requirements for materials and equipment are covered under other Sections of the Specifications.

A. Requirements In This Section:

1. Submittals for:
   a. Factory finish colors.
   b. Standard materials.
2. Proposed substitutions.
3. Materials, regarding:
   a. Equal materials.
   b. Optional materials.
   c. Plurality of terms.
   d. Factory finish colors.
4. Transporting and handling.
5. Storage and protection.

1.02 SUBMITTALS: Refer to Section 01300.

A. Submittals for Factory Finish Colors: Whether or not required elsewhere, submit color samples of materials specified to have a factory finish for selection and approval.

B. Submittal for Standard Materials: For the products specified by reference to standard or reference specifications, prepare and submit for approval a list of such materials or equipment by manufacturers' names and identifications to the extent requested by Architect.

1.03 PROPOSED SUBSTITUTIONS: Submit proposed substitutions to the Architect for approval. Contractor will be notified of the approved substitutions by Addendum. Architect may require the submission of Drawings, Product Data, Samples, and other information in approved form for consideration of proposed substitutions.

A. Approval or Rejection of proposed substitutions is at Owner's discretion, whose judgement will be final and will include consideration of the following factors among others in comparing equality of proposed substitutions with indicated or specified requirements:

1. Quality of materials, structural strength, and details of construction or fabrication.
2. Performance and function, mechanically and technically.
3. Appearance and finish, or characteristics permitting required finish to be applied.
4. If proposed substitutions require altering the arrangement of adjoining or related Work, resulting arrangement must be equal in convenience and practicality to original arrangement.
5. Products equal in quality and utility are generally competitive products and are generally equal in price. If approval is requested for materials or equipment more economical than the specified products, Owner may require the specified products.
6. An inequality in availability of replacement parts or maintenance services may be a determining factor.
7. Code approvals and service history.

B. **Resubmittal of Proposed Substitutions**: Do not resubmit proposed substitutions that are rejected in modified form. Upon rejection of a proposed substitution, Bidder may submit another proposed substitution within the time limit stated above. If the second proposed substitution is rejected or not received by the Architect within the specified time, provide only the indicated and specified Work at no additional cost to Owner.

C. **Compliance**: Use of Approved Substitutions does not relieve Contractor from compliance with the Contract Documents. Contractor shall bear all extra expense resulting from approved substitutions where substitutions affect adjoining or related Work.

D. **Unauthorized Substitutions**: If substitute materials are installed without prior approval, remove all the unauthorized materials and install those indicated or specified, at no extra cost to Owner.

PART 2 - PRODUCTS

2.01 MATERIALS: Provide new materials and equipment unless otherwise indicated or specified.

A. **Equal Materials**: Any material, apparatus, equipment, or process indicated or specified by patent or proprietary name or name of manufacturer shall be deemed to be followed by "or equal as approved in writing by the Architect", unless it is specified that substitutions are not acceptable for a particular material, apparatus, equipment, or process item. Criteria will be the same as above in Paragraph 1.03 (A) 1-7.

B. **Optional Materials**: Where more than one proprietary brand name is specified, Contractor may provide any one of the materials or equipment specified. Before placing orders, advise Architect in writing of each named material, appliance, or piece of equipment proposed for the Work and its intended use. Provide only one brand, kind, or make of material for each purpose throughout the Work not withstanding that similar material or equipment of two or more manufacturers may be specified for the same purpose.

C. **Plurality of Terms**: For all materials or equipment referred to in the singular number, it is intended unless otherwise limited that such references apply to as much material or equipment as is required to complete the Work.

D. **Factory Finish Colors**: Color of material specified to be furnished with factory finish is subject to Architect's approval. If available color is not approved, modify factory finish color to conform to the Architect's color instructions or provide another manufacturer's approved product which has an acceptable finish color, at no extra cost to Owner.

PART 3 - EXECUTION

3.01 TRANSPORTING AND HANDLING: Transport and handle all materials and equipment by methods that prevent damage, defacing, or overstressing. Lift the equipment, machinery and heavy fabricated products only at the lifting points designated by the manufacturer or, if not so designated, at the points or along the members designed to support the items when installed. Contractor shall bear all loss which may result from transporting and handling of materials and equipment and shall provide approved replacements for damaged or defective items at no extra cost to Owner. Conform handling procedures to applicable Codes.

3.02 STORAGE AND PROTECTION: Materials and equipment designed for permanent weather exposure may be stored off the ground without covering provided the equipment closures and seals are intact. Store all other materials and equipment off the ground and in dry, covered, weather-protected locations. Exercise special care to protect moisture-sensitive materials and other materials damaged by light (ultraviolet) or heat. Arrange adequate ventilation under protective covering to prevent condensation.

END OF SECTION

SECTION 01630

SUBSTITUTION REQUEST FORM

No substitutions Will be considered without this completed substitution request form and supporting documentation. Substitutions made without completion of this form will be considered defective work as Stated in the Contract.

Date: _____ Number: _____

Project:

From: _____

Re: Request for Substitution

The Trade Contractor proposes the following substitution in accordance with the requirements of the Contract Documents:

Scope of Substitution _____

_____

Specification Reference _____

_____

Drawing Reference _____

_____

Reason for Proposed Substitution _____

_____

_____

_____

Impact on Project Cost _____

_____

Impact on Project Schedule _____

Impact on Guarantees and Warranties _____

Coordination Required with Adjacent Materials and System _____

List Deviations From Specified Requirements _____

Attachments: Attach supporting documentation sufficient for Architect to evaluate substitution. Substitution Request Forms submitted without adequate documentation will be returned without review.

Attachments _____

Response Date: List date by which response by Architect is requested to maintain project schedule and allow sufficient time for inclusion of proposed substitution.

Response Date _____

Submitted By _____

Firm and Address _____

Signature below signifies acceptance of responsibility for accuracy and completeness of information included in this Substitution Request Form.

Authorized Signature _____

Authorized Representative of Trade Contractor

RESPONSE

Notations listed below shall have same meaning as on Architect's approval stamp. Clarifications to or changes in project schedule or time shall be processed using standard project forms.

Architect's Response

_____ Approved

_____ Approved as Corrected

_____ Revise and Resubmit Rejected

_____ Returned Without Review

Remarks _____

_____

_____

_____

_____

_____

Date _____

Signed _____

Architect's Authorized Representative Date

Owner's Acceptance _____

Owner's Authorized Representative Date

END OF FORM

SECTION 01700

CONTRACT CLOSEOUT

PART 1 - GENERAL

1.01 DESCRIPTION: This Section covers general requirements for contract closeout.

A. Requirements In This Section:

1. Clean up and disposal.
2. Record Drawings.
3. Operation and maintenance manuals.
4. Maintenance materials.

1.02 SUBMITTALS under this Section shall conform to the Article "General Submittal Requirements" of Section 01300.

1.03 PREFINAL INSPECTION; SUBSTANTIAL COMPLETION:

A. PreFinal Inspection: Upon “substantial completion” of the Work, Contractor shall notify Architect in writing that Contractor has reviewed all subcontractor work for completion and request a “Prefinal inspection” of the Work. If Architect concurs that “substantial completion” has been reached, he will review the Work and list items to be completed or corrected. List will be amended as required to include items subsequently observed.

B. Substantial Completion Defined: “Substantial Completion” of the Work is the status, as approved by the Architect, when construction is sufficiently complete, in accordance with the Contract Documents, so Owner can occupy or utilize the Work for the use for which it is intended.

1.04 FINAL INSPECTION: See Supplementary Conditions, Article “1” titled “Final Adjustment and Completion”. Final inspection will begin when Contractor has completed Article A above, Architect will review the Work and list any items to be completed or corrected. Contractor shall correct and/or complete the Work. The Architect will charge the Owner $ 125.00/hr. for duplicate "Punch" Deficiency Lists and Back Checks and also for more review than 2 times for Shop Drawings. The Owner in turn will back charge the Contractor for the additional work preformed by the Architect.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.01 CLEAN UP AND DISPOSAL: Requirements herein form a part of all other Sections of the Specifications and shall be coordinated with such additional clean up and disposal requirements as may be specified in other Sections.

A. **General**: Leave the entire Work broom clean except where vacuum clean or other condition is specified.

1. Control During The Work. Take precautions to avoid spread of dust, dirt, debris, water, paint, cement, sprayed materials, and other substances about the site or to adjacent property. Clean up splatterings or spills of materials at time of occurrence. Remove dirt, debris, waste, and rubbish frequently, and do not allow to accumulate in the structure or on the site. Do not store flammable or toxic materials in the structure.

B. **Contractor's Supervision**: Inform all trades and workmen of the cleaning up requirements specified, and monitor where Work is in progress to ensure full compliance with all clean up requirements in this and other Sections.

C. **Architect's Inspection**: Give the Architect at least 3 working days advance notice of readiness for inspection as each phase or area of Work is completed for occupancy. Correct any deficient cleaning operations, as determined and directed by Architect.

D. **Disposal**: Do not place rubbish or waste material in fills or backfills. Remove debris, rubbish, and waste material from Owner's property to a lawful disposal area and pay all hauling and dumping charges. Conform to pertaining Federal, State, and local laws, ordinances, rules, regulations, and orders.

E. **Final Clean Up - Interior**: Leave surfaces in clean condition with all dust, dirt, stains, handmarks, paint spots, droppings, and other blemishes and defects completely removed.

1. Hard Floors: Wash and dry concrete, tile, elastomeric, and similar floors, free of streaks or stains.
2. Resilient Flooring: Freshly wax and buff as specified in Division 9.
3. Resilient Bases: Clean off adhesive smears and wipe clean.
4. Carpet: Vacuum clean free of lint, soil, and dust.
5. Bare and Painted Surfaces: Clean of dust, lint, streaks, or stains.
6. Tile Walls: Clean and polish.
7. Vinyl Wall Covering: Remove all adhesive on surfaces.
8. Hardware and Metal Surfaces: Clean and polish all exposed surfaces using noncorrosive and nonabrasive materials.
9. Glass: Wash and polish both sides, and leave free of dirt, spots, streaks, and labels. Clean and polish mirrors.
10. Ceilings: Clean and free of stains, handmarks, and defacing.
11. Fixtures and Equipment: Clean and polish mechanical and electrical fixtures and like items. Leave lighting fixtures free of dust, dirt, stains, or waste material. Clean and service equipment and machinery, ready for use.

F. **Surfaces Not Mentioned**: Clean according to the intent of this Section and as required for Architect's approval.

G. **Contaminated Earth or Materials**: Final clean up operation includes removal and disposal of earth that is contaminated or unsuitable for support of plant life in planting areas, and filling of resulting excavations with suitable soil as directed and approved. 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 all areas that have been oiled, paved, or chemically treated. Do not dispose of waste oil, solvents, paints, solutions, or similar material of a penetrating nature by depositing or burying on Owner's property.

3.02 RECORD DRAWINGS:

A. **Record Set During The Work**: At site, maintain at least one set of Drawings as a Field Record Set; apportion copies to the various Subcontractors for recording of their portions of the Work. Also maintain at least one copy of all Addenda, Modifications, approved submittals, correspondence, and transmittals at site. Keep Drawings and data in good order and readily available to Architect, Owner, and their representatives.

B. **Changes**: Clearly and correctly mark Record Drawings to show all changes made during the construction process at the time the changed Work is installed. No such changes shall be made in the Work unless authorized by a Modification or by specific approval of deviations or revisions in submittals.

C. **Final Record Drawings**: Prior to Substantial Completion, Architect will order for Contractor, at Contractor's expense, one complete set of Drawings, lncluding Clarification and Interpretation Drawings and the Drawings issued by Addenda, printed as reproducible mylar transparencies.

D. **Preparation of Final Record Drawings**: Contractor shall transfer all recorded changes in the Work indicated on the Field Record Set to the reproducible mylar transparencies. Changes for all trades shall be neatly and clearly drawn and noted in ink by skilled draftsmen, and shown technically correct.

E. **Approval**: Prior to Architect's inspection for Substantial Completion, submit both the Field Record Set and the Final Record Drawings to the Architect for review, and make such revisions as may be necessary for Final Record Drawings to be a true, complete, and accurate record of the Work in the Architect's opinion.

F. **Conferences**: Contractor and any of the Subcontractors involved shall attend post-construction conferences to clarify the Final Record Drawings as may be required by Architect, at no extra cost to Owner.

3.03 MANUALS: Obtain data from the various manufacturers and submit instruction, operation, and maintenance manuals to the extent required under other Sections of the Specifications.

A. **Contents**: Each manual shall have an index listing the contents. Information in the manuals shall include not less than (a) general, introductions and overall equipment description, purpose, functions, and simplified theory of operation, (b) specifications, (c) installation instructions, procedures, sequences, and precautions, including tolerances for level, horizontal, and vertical alignment, (d) grouting requirements including grout spaces and materials, (e) list showing lubricants for each item of mechanical equipment, approximate quantities, needed per year, and recommended lubrication intervals; where possible, the types of lubricants shall be consolidated with equipment manufacturers' approval in order to minimize the number of different lubricants required for maintenance, (f) startup and beginning operation procedures, (g) operational procedures, (h) shut down procedures, (i) short and long term inactivation procedures, (j) repair, maintenance, and calibration instructions, (k) parts lists and all spare parts recommendations, (l) lists of all special tools, instruments, accessories, and special lifting and handling devices required for periodic maintenance, repair, adjustment, and calibration, and (m) other information as may be specified or required for approval.

B. **Format and Binding**: Include drawings and pictorials to illustrate the text as necessary to fully present the information. Where the information includes a family of similar items, strike out the inapplicable information or identify applicable portions by heavily weighted arrows, boxes, or circles. Bind each manual in sturdy covers labeled to indicate the equipment to which it applies. Bind manuals less than one inch thick in standard three-ring binders; others shall have sturdy covers secured with removable fasteners and, when more than two inches thick, shall be bound in locking-bar post binders with rigid covers.

C. **Manual Submittals**: Unless otherwise specified, each submittal shall include two copies of each manual, one of which will be returned to the Contractor marked to show the required corrections or approval. When approved, deliver four copies to Architect unless otherwise specified.

3.04 MAINTENANCE MATERIALS: Furnish and deliver all the special tools, instruments, accessories, spare parts, and maintenance materials required by the Contract Documents, and furnish and deliver the special tools, instruments, accessories, and the special lifting and handling devices shown in the instruction manuals approved above. Unless otherwise specified or directed, deliver the items to the Owner, with the Contractor's written transmittal accompanying each shipment, in the manufacturer's original containers labeled to describe the contents and the equipment for which it is furnished. Deliver a copy of each transmittal to Architect for record purposes.

END OF SECTION

SECTION 01740

WARRANTIES AND GUARANTEES

PART 1 - GENERAL

1.01 DESCRIPTION: This Section covers general requirements for written warranties and guarantees required by the Contract Documents. Submission to and approval by the Owner of the warranties and guarantees is a prerequisite to final payment under the Contract.

1.02 MANUFACTURERS' WARRANTIES AND GUARANTEES: Deliver all the manufacturers' warranties and guarantees required by Contract Documents, with Owner named as the beneficiary. In addition, for all equipment and machinery, or components thereof, bearing a manufacturers' warranty or guarantee that extends for a longer time period than the Contractor's warranty or guarantee, deliver the manufacturers' warranties or guarantees in same manner. Refer to Section 01300, Paragraph "Equipment Data", for the submission of manufacturers' warranty or guarantee data.

1.03 FORM OF WARRANTY OR GUARANTEE: All written warranties and guarantees, except manufacturers' standard printed warranties and guarantees, shall be submitted on the Contractor's, Subcontractor's, material supplier's, or manufacturer's own letterhead, addressed to the Owner. All warranties and guarantees shall be submitted in duplicate, and in the form shown on the following page, signed by all pertinent parties and by Contractor in every case, with modifications as approved by Owner to suit the conditions pertaining to the warranty or guarantee.

1.04 SUBMISSION OF WARRANTIES OR GUARANTEES: The Contractor shall collect and assemble all written warranties and guarantees into a bound booklet form, and deliver the bound books to Architect for delivery to the Owner's attorney for final review and approval.

WARRANTY/GUARANTEE

FOR_____WORK

We, the undersigned, hereby warranty and guarantee that the parts of the Work described above which we have furnished and/or installed for:

SALINAS CITY ELEMENTARY SCHOOL DISTRICT
SHERWOOD ELEMENTARY SCHOOL
SALINAS, CALIFORNIA

is in accordance with the Contract Documents and that said Work as installed will fulfill or exceed all of the Warranty and Guarantee requirements. We agree to repair or replace Work installed by us, together with any adjacent Work which is displaced or damaged by so doing, that proves defective in workmanship, material, or operation within a period of _____ _____( ) year(s) from the date of final acceptance of by Owner or from the Date of Certificate of Substantial Completion, whichever is the earlier, ordinary wear and tear and unusual abuse or neglect excepted.

In the event of our failure to comply with the above-mentioned conditions within a reasonable time period determined by the Owner, after notification in writing, we, the undersigned, collectively and separately do hereby authorize the Owner to have said defective Work repaired and/or replaced and made good, and agree to pay to the Owner upon demand all moneys that the Owner may expend in making good said defective Work, including all collection costs and reasonable attorney fees.

Date:_____ _____
(Subcontractor, Sub-subcontractor, Manufacturer or Supplier)
By_____
Title_____
State License No._____

Date:_____ _____
(Contractor)
By_____
Title_____
State License No._____

Local Representative to be contacted for maintenance, repair and/or replacement service:

Name:_____
Address:_____
Phone Number:_____

END OF SECTION

SECTION 01900

MISCELLANEOUS WORK

PART 1 - GENERAL

1.01 DESCRIPTION. The requirements of all other Sections of Division 1 apply to this Section. Provide various materials and perform all miscellaneous operations as indicated, specified, and required. This Section applies to all other Sections of the Specifications.

A. Work In This Section: Principal items include:

1. Miscellaneous demolition, cutting, alterations, and repairs to the existing facilities as shown, specified, and required to complete the Work.
2. Relocation and reinstallation of existing construction and finish as shown.
3. Salvage, storage, and protection of existing items to be reinstalled.
4. Salvage and delivery to Owner of designated removed items as directed.

1.02 SUBMITTALS: Refer to Section 01300 for procedures.

A. Schedule of Work: Perform Work in existing facilities during such hours and by methods as are approved by Owner. Submit proposed schedules itemizing dates and hours that the various items of Work in existing facilities will be started and completed. Owner reserves the right to modify proposed schedules to eliminate conflicts and ensure use of existing facilities during the Work. Exactly follow the schedule as finally approved by Owner. No extra payment will he made to the Contractor for the Work required to be performed during night, Saturday, Sunday, or holiday hours. Revise and resubmit schedules when timing or sequence changes occur or are ordered by Owner.

1.03 JOB CONDITIONS:

A. General: Coordinate Work among the trades and with Owner to assure the correct sequence, limits, methods, and times of performance. Arrange the Work to impose minimum hardship on operation and use of the facilities. Install protection for existing facilities, contents, and new Work against dust, dirt, weather, damage, and vandalism, and maintain and relocate as Work progresses.

B. Access: Confine entrance and exit operations to access routes designated by the Owner.

C. Existing Portable Items: Owner will remove portable equipment, furniture, and supplies from involved existing areas prior to start of Work therein. Cover and protect remaining items.

D. Existing Conditions: Intent of Drawings is to show existing site and facility conditions with information developed from the original construction documents,

field surveys, and Owner's records, and to generally show the amount and type of demolition and removals required to prepare existing areas for new Work.

E. **Verification of Conditions**: Perform a detailed survey of all existing site and building conditions pertaining to the Work before starting Work. Report to the Architect all discrepancies or conflicts between Drawings and actual conditions in writing for clarification and instructions and do not perform Work where such discrepancies or conflicts occur prior to receipt of Architect's instructions.

F. **Special Noise Restrictions**: Exercise caution and care to prevent generation of unnecessary noise and keep noise levels to the minimum possible. When ordered by Owner or Architect, immediately discontinue such methods that produce noise disruptive or harmful to the facility functions and occupants, and perform Work by unobjectionable methods. Equip air compressors, tractors, cranes, hoists, vehicles, and all other internal combustion engined equipment with "residential" grade mufflers. Muffle unloading cycle of compressors. Remove from the site any equipment producing objectionable noise as determined by Owner or Architect.

G. **Shoring and Bracing**: Provide support, shoring, and bracing required to preserve the structural integrity and prevent collapse of existing construction that is cut into or altered as a part of the Work.

H. **Overloading**: Do not overload any part of the structures beyond a safe carrying capacity by placing of materials, equipment, tools, machinery, or any other item thereon.

I. **Building Security**: Secure building entrances and exits with locking or another approved method in accordance with Owner's instructions.

K. **Safeguarding of Owner's Property**: Assume care, custody, and responsibility for safeguarding all of Owner's property of every kind, whether fixed or portable, remaining in spaces vacated and turned over to Contractor by the Owner for his exclusive use in performing the Work until the Work therein or related thereto is completed and the rooms or spaces are re-occupied by Owner. Furnish all forms of security and protection necessary to protect the Owner's property. Regardless of cause, Contractor shall repair, replace, or otherwise acceptably make good all of the Owner's property under his care, custody, and safeguarding that is damaged, injured, lost, stolen, or missing from the time each such room or space is turned over to Contractor for the Work until re-occupied by Owner, at Contractor's expense and as directed by the Owner.

L. **Use of Owner's Telephones**: Do not use nor allow anyone other than the Owner's employees to use telephone in rooms and spaces turned over to Contractor for the Work except in the case of a verifiable emergency. Install temporary dial locks on telephone instruments to prevent all unauthorized use, or arrange and pay for temporary removal and reinstallation of instruments.

Reimburse to the Owner all telephone toll charges originating from the telephones in such rooms and spaces except those arising from emergencies or use by Owner's employees.

M. **Welding**: Conform to following requirements where welding is performed in or on existing facilities.

1. Protection During Welding: Conform to Title 8, CCR. In addition, protect occupants and the public with portable solid vision barricades around locations where welding is performed plus signs warning against looking at welding without proper eye protection, or equivalent.
2. Welding Smoke Control: Attention is directed to existing smoke detectors. Perform welding by methods that produce the minimum feasible smoke and fumes. Furnish portable type smoke collection equipment and supplementary ventilating equipment as required to prevent smoke and fume nuisances. Notify the Owner at least 48 hours in advance if a temporary deactivation of any smoke detector is required to prevent false alarms from welding operations. Owner's personnel will deactivate the detectors only for the period that welding is actually in progress.
3. Fire Extinguishers: Maintain a fully charged UL-labeled minimum 10-pound ABC fire extinguisher at every location where welding is performed within the facilities.
4. Fire Prevention: Before welding, examine existing construction and backing for combustible materials and finishes and for conditions where heat migration in metals may bring adjoining materials to ignition temperature. Use positive fire prevention measures including the temporary removal and reinstallation of combustible materials, installation of temporary shields and/or heat sinks, and other necessary means. When actual field conditions are such that positive fire prevention measures cannot be achieved, notify Architect and do not proceed with the involved Work until receipt of Architect's instructions.

N. **Protection of Floors**: Exercise caution to protect floor surfaces and coverings from damage. Equip mobile equipment with pneumatic tires.

PART 2 - PRODUCTS (Not applicable to this Section)

PART 3 - EXECUTION

3.01 DEMOLITION, REMOVALS, ALTERATIONS, AND REPAIRS:

A. **Basic Requirement**: Restore all new and existing construction and improvements that are cut into, altered, damaged, relocated, reinstalled, or left unfinished by demolition and removals as a result of the Work to original condition or to match the adjoining Work and finishes and as indicated, specified, directed, and required. Workmanship and materials shall conform to

applicable provisions of other Sections of Specifications. Provide new fasteners, connectors, adhesives, and other accessory materials as required to complete approved reinstallations and restorations.

B. **Extent**: Perform demolition and removals to extent shown plus such additional demolition or removal as is necessary for completion even though not indicated. More or less of existing construction may be demolished or removed when such variation will expedite the Work and reduce cost to Owner, subject to approval.

C. **Removals**: Carefully remove Work to be salvaged or reinstalled and store under cover.

1. Walls, Partitions, and Ceilings: Demolish or remove by cutting down and not by tumbling, throwing, or dropping.
2. Concrete: Saw with power saw, or chip where sawing is not practicable, to prevent spalling of concrete to remain. Cut off reinforcing bars, except where bonded into new concrete or masonry, and paint ends with bituminous paint before enclosing.
3. Woodwork: Cut back to joint or panel line. Undamaged removed material may be reused.
4. Sheet Metal Flashings and Work: Remove back to a joint, lap, or connection. Secure loose or unfastened ends and make watertight.
5. Gypsum Wallboard: Cut back on straight lines to undamaged surfaces, with at least two opposite cut edges centered on supports.
6. Acoustical Ceilings: Carefully dismantle ceilings to be reinstalled, and remove hanger wires where ceilings are not reinstalled.
7. Tile: Remove back to sound tile and backing on joint lines where portions are to remain.
8. Flooring: Completely remove flooring and clean the backing of old cement or adhesive.
9. Miscellaneous Items: Remove items not mentioned but required to be removed in such manner as will minimize damage to Work to remain.

D. **Patching, Repairing, and Finishing**:

1. Concrete: Keep cut edges damp for 24 hours and scrub with a neat portland cement mortar just before new concrete is placed; epoxy adhesive may be used in lieu of cement mortar. Finish new concrete to match existing. Use 3,000 psi concrete for repairs except 2,000 psi concrete may be used for slabs on grade. At cut concrete edges to remain exposed, apply adhesive and restore with minimum 3/4" thick cement mortar finished to match adjoining surfaces.
2. Metal Items: Grind cut edges to remain exposed smooth and rounded.
3. Sheet Metal: Restore removed or damaged sheet metal items as required or directed.
4. Gypsum Wallboard: Refasten cut edges of existing board. Apply patches with at least two opposite edges centered on supports and secure

at 6" centers. Tape and finish joints and fastener heads. Make patching non-apparent when painted.

5. Resilient Flooring: Patch and repair as specified in Section 09650.
6. Painted Surfaces: Prepare patched areas and refinish as specified in Section 09900.
7. Miscellaneous Items: Patch and repair as required and approved.

3.02 PREPARATION OF EXISTING WORK:

A. **Holes**: Drill holes through existing concrete or masonry for new conduit and/or piping, and do not jack-hammer.

B. **Sandblasting**: Work includes sandblasting of existing surfaces to receive new materials secured by cementitious, adhesive, or chemical bond (such as concrete, toppings, elastomeric coatings, plaster, mortar, etc.), and the sandblasting of other surfaces as shown, specified, directed, or required for proper preparation of surfaces. Completely remove existing finish, stains, oil, grease, bitumen, penetrated mastics and adhesives including primers, and all other substances deleterious to the bond or connection of new materials, and expose clean sound surfaces. Use wet sandblasting for interior surfaces, and for exterior surfaces where directed or necessary to prevent creation of a dust nuisance.

C. **Metal Framework Painting**: Wire brush, clean and paint scarred areas, welds and rust spots on the visible surfaces. Touch up galvanized surfaces with galvanized repair paint applied in accordance with the manufacturer's instructions. In areas where touch-up painted surfaces are to be exposed, apply the paint to blend into the adjacent surfaces in a manner that will minimize visual discontinuity in the coatings.

3.03 SALVAGE: Existing items not to be reused or reinstalled that Owner intends to retain will be designated by Owner prior to start of removals in the pertaining area. Carefully remove, salvage, box or bundle as approved, and deliver such items to storage at site as Owner directs.

3.04 DISPOSAL: Conform to Section 01700. Dispose of removed material off the site except items to be salvaged or reinstalled. Promptly remove waste and debris and do not accumulate within facilities or on site.

END OF SECTION

SECTION 02513

ASPHALTIC CONCRETE PAVING

PART 1 - GENERAL

1.01 DESCRIPTION: Division 1 applies to this Section. Provide asphaltic concrete paving (repair or replacement) complete as indicated, specified, and required.

A. Work In This Section: Principal items include:

1. Subgrade preparation.
2. Soil sterilization.
3. Aggregate base course.
4. Prime coat.
5. Asphaltic concrete paving, patching in areas of construction.
6. Fog seal coat.

B. Related Work Not In This Section:

1. Site preparation and earthwork, including rough grading.
2. Portland cement concrete curbs, drives, and paving.

1.02 QUALITY ASSURANCE:

A. Reference Specifications: Conform to following reference specifications to the extent specified. The term "Engineer" in the reference specifications shall be understood to mean "Architect". Requirements of measurement or payment in the reference specifications are hereby deleted; include Work of this Section under the Contract Sum for entire Work.

1. SSPWC Spec. The "Standard Specifications for Public Works Construction", Current Edition.
2. State Standard Spec. Standard Specifications of the California Business and Transportation Agency, Dept. of Public Works, Div. of Highways, Current Edition.

B. Proportioning of Plant Mix: Determine exact quantities of bituminous binder and mineral aggregate required to produce a mix equal to mix quality specified.

1.03 SUBMITTALS: Refer to Section 01300 for procedures.

A. Product Data: Submit the manufacturer's technical Product Data and application directions for soil sterilizer.

B. Certificates and Statement: Submit certificates from asphalt concrete products suppliers that quality, gradation, proportions, and mixing of materials supplied

under this Section meet the requirements specified. Materials not conforming to specified requirements are defective. Reject defective materials whether or not in place. Submit a statement supported by weight tickets showing the following information:

1. Calculations showing minimum amount of asphaltic concrete materials required for total area to be paved.
2. Amounts actually installed.

1.04 JOB CONDITIONS: Provide protection and repair adjacent surfaces and areas which may be stained or damaged as a result of installation. Protect installed paving Work until final acceptance. Repair or replace damaged or defective paving to original specified condition.

1.05 WARRANTY: Refer to Section 01740. Furnish to Owner a written warranty for one year, except warrant against weed or plant growth through paving for two years. Condition warranty to cover any portion of asphaltic concrete in which creeping, shoving, cracking, raveling, or softening occurs or in which weed growth occurs, and all depressed areas which collect water due to improper grading, placing, or defective materials during the warranty period. Repairs include the restoration of adjoining or applied materials and finish items.

PART 2 - PRODUCTS

2.01 MATERIALS:

A. **Soil Sterilizer**: Standard product non-selective borate-chlorate type sterilizer having minimum 46% boron-trioxide equivalent, as approved.

B. **Aggregate Base Course**: State Standard Spec Section 26, Class 2, 3/4" gradation maximum.

C. **Prime Coat**: SSPWC Spec Subsection 302-5.2, Grade SC-250 or SC-70, as approved.

D. **Asphaltic Concrete Surface Course**: SSPWC Spec Subsection 203-6, Type I-C2 PG 70-10.

E. **Fog Seal Coat**: Asphalt emulsion SS-1, State Standard Spec Section 37.

PART 3 - EXECUTION

3.01 CONSTRUCTION:

A. **Subgrade Preparation**: Conform to SSPWC Spec Subsection 301-1, top 6" compacted to minimum 95% relative compaction at any location. Maintain the subgrade slightly above optimum moisture content until covered with subsequent materials.

B. **Soil Sterilizing**: Apply sterilizer according to manufacturer's directions using the dry or aqueous spray process, minimum quantity of dry undiluted material per 100 square feet of paving conforming to manufacturer's directions for control of medium and heavier weed growth and to meet warranty requirements. If necessary, apply supplemental watering to fully dissolve all sterilizer and obtain 2" to 3" penetration into the subgrade. Reroll treated subgrade to specified compaction. Do not apply sterilizer during rain or windy weather and prevent contamination of landscaping areas.

C. **Aggregate Base Course**: Conform to SSPWC Spec Subsection 301-2. Place base course in one or two layers as required to produce 95% relative compaction. Deliver to site as a uniform mixture. Construct to indicated compacted thickness.

D. **Prime Coat**: Conform to SSPWC Spec Subsection 302-5.2, quantity per square yard as approved. Apply on all completed aggregate base course.

E. **Asphaltic Concrete**: Conform to SSPWC Spec Subsection 302-5 including requirements for smoothness and density. Apply asphaltic cement or emulsion paint binder on abutting concrete. Construct to minimum compacted thickness indicated.

F. **Drainage Test**: Flood paving with water when rolling is completed and asphaltic paving is cool. Remove paving in improperly draining areas and install properly draining paving as directed, at no extra cost to Owner. Correction of low areas by skin patching is not acceptable.

G. **Slurry Coating:** Mixing, delivery and placing of slurry coating shall be in accordance with State Standard Spec Section 302-4. Install over existing asphalt concrete paving where indicated on drawings or as noted by owner. The material mixture is a emulsified asphalt, mineral aggregates and water. Substrate Preparation cut out existing deteriorated or densely oil or grease impregnated asphalt concrete paving and replace with new select base and asphalt concrete materials of a heavier density than the in place materials. Use hot smoothing irons to obtain flush joint lines. Repair all surface defects and leave surfaces ready to receive slurry coating materials. Clean all existing asphalt concrete surfaces of oil, grease and foreign materials including parking striping and markings by approved methods and leave surfaces dry.

H. **Fog Seal Coat**: Conform to State Standard Spec Section 37. Spray apply at rate of 0.05 to 0.10 gallons per square yard, the exact quantity as required to fully seal the paving surface, as approved. Cover and protect adjoining surfaces from staining.

END OF SECTION

SECTION 02579

PAVEMENT MARKING, BUMPERS TRUNCATED DOMES AND SIGNAGE

PART 1 - GENERAL

1.01 DESCRIPTION: Division 1 applies to this Section. Provide pavement marking, bumpers, truncated domes and signage as indicated, specified, and required.

A. Work In This Section: Principal items include:

1. Pavement markings.
2. Truncated domes.
3. Accessible signage.
4. Bumpers
5. Rubber speed bumps.

PART 2 - PRODUCTS

2.01 TRAFFIC PAINT: Type specially manufactured for pavement traffic line markings by Dunn Edwards, Wellborn, Sherwin-Williams, Devoe, Sinclair, Pittsburg Paint, Behr, or equal, white color unless otherwise directed.

2.02 TRUNCATED DOMES: Provide truncated domes by Engineered Plastic Inc., 800-682-2525 or approved equal by the District/City, installed where indicated on drawings. The domes shall be warranted for a period of 5 years and shall be ADA compliant and installed in accordance with manufacturers recommendations and specifications.

A. The Vitrified Polymer Composite (VPC) Cast In Place Detectable/Tactile Warning Surface Tile specified is based on Armor-Tile manufactured by Engineered Plastics Inc. (800-682-2525). Existing engineered and field tested products, which have been in successful service for a period of three (3) years are subject to compliance with requirements, may be incorporated in the work and shall meet or exceed the specified test criteria and characteristics.

B. Color: Yellow conforming to Federal Color No. 33538, unless otherwise selected by Architect in another color(s), color shall be homogeneous throughout the tile. Tiles are also available in Light Grey (Federal Color No. 26280), Dark Grey (Federal Color No. 36118), Onyx Black (Federal Color No. 17038), Pearl White (Federal Color No. 37875), Brick Red (Federal Color No. 22144), Ocean Blue (Federal Color No. 15187), Ochre Yellow (Federal Color No. 23594), and Colonial Red (Federal Color No. 20109).

2.03 PARKING BUMPERS: Standard units as detailed on drawings of minimum 3500 psi concrete and reinforced full length with not less than two No. 4 deformed reinforcing bars, lengths as indicated. Omit stake holes in adhesive secured bumpers.

2.04 RUBBER SPEED BUMPERS: Provide rubber speed bumps by Speedbumpsandhumps.com, (866) 734-0605, location of units as detailed on drawings. The size shall be 19 feet Speed Bumps – 232" 1x 14" x 2.25", color and pattern as selected by Architect.

PART 3 - EXECUTION

3.01 PAVEMENT MARKING AND STRIPING: Paint traffic and parking lines as indicated. Machine-apply paint in accordance with the directions of the paint manufacturer, upon completion broadcast fine sand into the wet paint to facilitate a more slip-resistant surface. Unless otherwise shown, paint lines 4" wide and as required to achieve complete opacity. Paint directional arrows, numbering, and lettering in similar fashion and with same paint. Produce completed painting and striping free of holidays and whiskers. Be responsible for paint droppings and overspray. Completely remove droppings and repair injured surfaces in a satisfactory manner. Paint disabled lines and markings a minimum of 3" wide with blue color equal to Color No. 15090 per Federal Specification 595B, disabled parking symbols, stall striping, debarkation aisles and path of travel lanes to the extent required by the Code and as enforced by the local jurisdiction where indicated. Parking spaces for the disabled shall be marked according to CBC Code requirements. The tactile warning lines shall be in conformance to CBC Code requirements.

3.02 ACCESSIBLE SIGNAGE: Set in accordance with Code Standards and as detailed on drawings, provide reflectorized International Symbol of Accessibility signs and required text with porcelain enamel finish, and steel frame. Mount and finish required by Building Code. Locate signage and designed disabled stalls where indicated on site. Post mounted and wall mounted signs shall be fabricated from 16 gage enameling iron with porcelain enamel finish. Mount signs to posts with minimum two 3/16" diameter round head bolts with tamperproof nuts, galvanized. Posts are 2" diameter galvanized steel pipe weighing a minimum of 3.65 lbs per foot and conforming to ASTM A53, Schedule 40 or 2" x 2" galvanized steel tubing, weighing a minimum of 4.31 lbs per foot and conforming to ASTM A500, Grade B, 3/16" thick wall thickness.

3.03 BUMPER INSTALLATION: Set as detailed on drawings, if none install bumpers with three 3/4" diameter galvanized steel pipes, or equal, driven to minimum 12" penetration into subgrade. Fully embed bumpers in epoxy concrete adhesive where installed on portland cement concrete.

3.04 RUBBER SPEED BUMPERS: Set per manufacturers recommendations and as detailed on drawings, Fully embed bumpers in epoxy adhesive where installed.

END OF SECTION

SECTION 03300

CONCRETE

PART 1 - GENERAL

1.01 DESCRIPTION: Division 1 applies to this Section. Provide all constructed of concrete (path or replacement) both exterior and interior slab work complete as indicated, specified, and required. Refer to Section 01900 Miscellaneous Work for additional materials and information.

1.02 QUALITY ASSURANCE: Construct forms conforming to the tolerances specified in ACI 301, "Specifications for Structural Concrete for Buildings", as applicable, unless exceeded by requirements of regulatory agencies or otherwise indicated or specified.

1.03 SUBMITTALS: Refer to Division 1 for procedures.

A. **Shop Drawings**: Submit Shop Drawings showing form pattern layouts of all exposed exterior and interior concrete dimensioned to precisely locate grooves, form panel jointing, and similar features. Review and approval will not include form strength and adequacy.

B. **Reinforcing Bars**: Include layouts, sections, and details for all congested conditions, typical bending diagrams and offsets, splice lengths and locations, proposed layout where vertical and horizontal bars intersect, and where welding is proposed, detailed to conform to AWS and Code requirements. After approval of initial submission, subsequent submittals may be waived.

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING: Deliver materials in timely manner to ensure uninterrupted progress. Store materials by methods that prevent damage and permit ready access for inspection and identification.

PART 2 - PRODUCTS

2.01 MATERIALS:

A. **Ready Mixed Concrete**: Materials and proportions shall comply with these Specifications. Concrete shall be in accordance with the requirements specified in Specifications for Ready Mixed Concrete, ASTM C94. In addition, all concrete shall comply with the following:

Cement shall comply with ASTM C150, Type II.
Aggregate shall conform to ASTM C33.
Grading of combined aggregates shall be per Section 1903A.5, 2019 CBC.
Concrete Strength: Refer to drawings for concrete psi requirements.
Concrete mixture per ACI 301, Section 4.
Waiver of Batch Plant Inspection: The concrete plant shall comply fully with the requirements of 2019 CBC Section 1705A.3.3.1 and shall

be certified to comply with the requirements of the National Ready Mixed Concrete Association. The plant must be equipped with an automatic batcher in which the total batching cycle, except for the measuring and introduction of an admixture, is completed by activating a single starter device.

When batch plant inspection is waived, the Architect or Structural Engineer in cooperation with the testing agency, shall propose a method for quality control acceptable to DSA minimum of one set of two cylinders shall be taken and tested for each 50 cubic yards of concrete or fraction thereof. Quantities of materials shall be certified by a licensed weigh master.

Form lumber:	WCLIB "Construction" grade or better, WWPA No. 1 or equal.
Form plywood:	PS 1-Current Edition, Group I, Exterior B-B Plyform or better, minimum 5 ply and 5/8" thickness, grade marked, not mill oiled. Plywood having medium or high density overlay is acceptable.
Water:	Clean, fresh, free from oil, acid organic matter and other deleterious substances.
Form ties:	Prefabricated rod, flat band, wire, or internally threaded disconnecting type, not leaving metal within 1-1/2" of concrete surface.
Form coating:	Resin type coating free of oil, silicone, wax, and non-drying material, not grain-raising.
Reinforcing bars:	ASTM A615, Grade 60
Tie wire:	Annealed steel, 16 gage minimum.
Curing compound:	ASTM C309, fugitive dye type.
Curing sheet:	ASTM C171, non-staining white types.
Joint filler:	ASTM D1751 and D1752, as specified.
Vapor barrier:	ASTM D2103 Polyethylene Sheeting, 8 mil. thickness, with minimum 2" wide waterproof plastic, self adhering.
Curing-sealer-hardener:	Burke Spartin-Cote Cure Seal-Hardener, West Concrete Floor Sealer, or equal.
Non-shrink grout:	Thoroseal "Thorogrip", Burke "Non-Metallic", or an approved equal of non-gas-forming type.
Admixtures:	Per Title 24, Section 1903A.6.

PART 3 - EXECUTION

3.01 PLACING: Place concrete at a maximum 4" slump per ASTM C143. Placing concrete shall conform to ACI 301 and, 2019 CBC.

A. **Slabs**: Compact and tamp concrete and bring 1/8" to 1/4" mortar to surface. Wood float to straightedges and screeds. Do not use steel or plastic floats of any kind for initial floating operations. Do not apply finish until all surface water disappears and surface is sufficiently hardened. Remove bleed water and laitance as it appears.

B. **Existing Concrete Surfaces**: Sandblast all concrete surfaces against which concrete is to be placed. Coordinate with Drawings.

C. **Joints In Concrete**: Locate joints only where approved. Obtain prior approval for points of stoppage of any pour. Clean and roughen surface of construction joints by removing entire surface and exposing 3/8" of clean aggregate solidly embedded in mortar matrix by sandblasting, chipping, or equal. Water and keep hardened concrete wet for not less than 2 hours before placing new concrete. Cover horizontal surfaces of existing or previously placed and hardened concrete with a 2" thick layer of fresh concrete less 50% of coarse aggregate just before balance of concrete is placed.

1. Expansion Joints: Conform to details on drawings and approved submittal. Provide expansion joint filled finished flush with slab surface except for those joints shown to be sealed with sealant.
2. Control Joints: Provide for concrete walks and exterior concrete pavement as indicated on drawing. Provide "Zip Strip" as distributed by S.C.A. Construction Supply, or equal as indicated on drawings. Install tops of the joints flush with the concrete surface and depth of joint a minimum of 3/8” the thickness of slab.

3.02 CONCRETE WORK: Use bituminous type joint filler. Cure all concrete for at least 10 days with liquid curing compound or sheet material except as otherwise specified. Construct all site concrete of 3,000 psi concrete unless otherwise indicated or specified. Provide reinforcing bars or mesh only where indicated.

A. **Concrete**: Provide 3/8" expansion joints as specified for curbs and where walks abut rigid structures, aligned with joints in curbs where adjoining, an apply a light broom finish perpendicular to traffic direction. Provide scoring as shown or directed.

3.03 CURING FORMED CONCRETE: Keep forms containing concrete in a wet condition until removed. Keep concrete continuously moist for at least 7 days after placing. Keep concrete moist with a fine fog water spray until protected by curing media. Use the water curing method, curing sheet material, or a clear liquid membrane-forming curing compound except as otherwise specified.

3.04 PATCHING FORMED CONCRETE: Remove fins, projections, and offsets. Cut out rock pockets, honeycomb, and other defects to sound concrete, edges of cuts straight and back-beveled. Dampen cuts and scrub with neat portland cement slurry just prior to patching, or apply an approved epoxy concrete adhesive. Saturate form tie holes with water and fill all voids and patches with flush smooth-finished mortar of same mix as concrete (less coarse aggregate), cure, and dry. No other finishing operations are required.

3.05 FORM ERECTION AND REMOVAL: Conform to ACI 301 and ACI 347 "Recommended Practice for Concrete Formwork" except as exceeded by requirements of Code, regulatory agencies, or herein.

A. **Construction**: Coat forms with the specified resin coating, not form oil. Construct forms to exact shapes, sizes, lines, and dimensions required to obtain level and plumb and straight surfaces. Provide openings, offsets, keys, anchorages, recesses, reglets, moldings, chamfers, blocking, screeds, drips, bulkheads, and all other required features. Make forms removable without hammering or prying against concrete. Space forms apart with metal spreaders. Construct forms to accurate alignment, location and grades, and provide against sagging, leakage of concrete mortar, or displacement occurring during and after placing of concrete. Coordinate installation of inserts in forms according to Shop Drawings and instructions of other trades.

B. **Corners and Angles**: Form exposed concrete corners and angles square unless otherwise indicated.

C. **Form Joints**: Fill joints to produce smooth surfaces, intersections and arrises. Use polymer foam or equivalent fillers at joints and where forms abut or overlap existing concrete to prevent leakage of mortar.

D. **Cleanouts and Cleaning**: Provide temporary openings in forms for cleaning and inspection. Clean forms and surfaces to receive concrete prior to placing.

E. **Re-Use**: Clean and recondition form material before re-use.

F. **Time of Form Removal**: Do not remove forms until the concrete attains sufficient strength to support its own weight and all superimposed loads. Leave all bottom forms in place until concrete has attained at least 66% of required strength but not less than 10 days. Reshore until full concrete strength is attained but in no case less than 21 days from date of concrete placing. Removal of forms and shores shall conform to Title 24, Section 1906A.2.

G. **Record**: Maintain a form and shoring removal record.

3.06 INSTALLATION OF REINFORCING: Provide additional bars at sleeves and openings as required. Before placing bars, and again before concrete is placed, clean bars of loose mill scale, oil, or other coating that might destroy or reduce bond.

A. **Securing in Place**: Accurately place bars and wire tie in precise position where bars cross. Bend ends of wire ties away from forms. Wire tie bars to corners of ties and stirrups. Support bars according to current edition of "Recommended Practice for Placing Bar Supports" of the Concrete Reinforcing Steel Institute, using approved accessories and chairs. Use precast concrete cubes with embedded wire ties to support reinforcing steel bars in concrete placed on grade and in footings.

B. **Clearances**: Maintain minimum clear distances between reinforcing bars and face of concrete as indicated or directed.

C. **Splices**: Do not splice bars at points of maximum stress except where indicated.

D. **Maintaining Bars In Position**: Assign a competent ironworker mechanic at every concrete placing location to inspect reinforcement and maintain all bars in the correct positions.

E. **Reinforcing Mesh**: Lap one full mesh plus 2" at splices, wire tie, and support the same as specified for bars.

F. **Approval**: Obtain inspection and approval as required by Article "Field Quality Control" before concrete is placed.

3.07 SLAB FINISHING: Refer to drawings for slab finish selections. Produce finished surfaces level or sloped as shown with maximum deviation of 1/8" from a 10-foot straightedge. Keep surface moist with fine fog spray of water as necessary. Dusting with dry cement or sand during finishing operations is not permitted. Finish exposed edges of slabs and slab joints with approved edging tool.

A. **Monolithic Trowel Finish**: Apply on all slab and flatwork surfaces not otherwise indicated or specified. After surface water disappears and floated surfaces are sufficiently hardened, steel trowel and retrowel to a smooth surface. After the concrete has set enough to ring trowel, retrowel to a smooth uniform finish free of trowel marks or other blemishes. Avoid excess retroweling that produces burnished areas.

B. **Broom Finish**: Prepare same as steel float finish, then apply a uniform approved texture finish as approved by Architect, by sliding a wire or stiff bristle broom in one direction along a straightedge guide placed at right angles to the direction of traffic. At walking areas, apply smooth finish 3" wide at edges, expansion joints and scoring.

C. **Swirl Non-Slip (Sweat Trowel) Finish**: Same as for monolithic steel trowel finish less second retroweling. When ready, produce non-slip finish by circular motion and slight lifting of trowel, done in regular pattern. At walking areas, apply scheduled finish 1" wide at all edges, expansion joints, and scoring.

D. **Scoring**: Provide where shown or directed, using tool of approved size and profile. Run score lines straight and of uniform appearance. If scoring is not indicated, obtain Architect's instructions not less than two working days before the day slab concrete is placed.

3.08 SLAB CURING: Shall conform to Title 24, Section 1905A.11. Promptly apply curing material as soon as the finishing operations are completed without marring surfaces, and in any case on the same day. Apply liquid compounds in accordance with manufacturer's

published application rates; apply 2 spray coats, second coat at right angle to first coat. Cover adjoining surfaces. Equip spray nozzles with a wind-shield suitable for wind conditions.

A. **Curing Period and Protection**: Maintain curing materials in sealed conditions for a minimum of 10 days after application. Keep all traffic on the curing surfaces to the minimum possible, and completely off the liquid compound cured surfaces. Immediately restore all damaged or defective curing media.

B. **Restriction**: Do not apply liquid membrane-forming curing compound on concrete to receive subsequent concrete or mortar, or on surfaces to receive subsequently applied materials unless such use and the specific compound used are approved by the manufacturer of material to be applied; verify with related trades.

C. **Liquid Curing Compound**: Use for slabs, subject to above restriction.

D. **Sheet Curing**: Use curing sheet material. Seal all laps and edges with plastic pressure-sensitive tape; immediately repair tears during curing period. Verify that surfaces remain damp for full curing period; if necessary, lift sheeting, wet surfaces with clean water, and replace the sheeting. Use on surfaces where curing compound is not permitted.

E. **Water Curing**: Option to curing compound or sheet curing method. Keep concrete continuously wet for entire curing period.

3.09 SITE CONCRETE WORK: Use bituminous type joint filler. Cure all concrete for at least 10 days with liquid curing compound or sheet material except as otherwise specified. Construct all site concrete of 2,000-psi concrete unless otherwise indicated or specified. Provide reinforcing bars or mesh only where indicated.

A. **Concrete Curbs**: Provide 3/8" thick expansion joints at beginning and at end of curves, intersections, and 20-foot intervals between, set plumb, square, and to same profile as the curbs. Edge curb tops to 1/2" radius and vertical joints to 1/4” radius. Apply smooth finish followed by fine hairbrush finish.

B. **Concrete Gutters**: Provide 3/8" thick expansion joints as above for curbs and apply a light broom finish with a 3” wide steel trowel finish at flow line.

C. **Combination Curb and Gutter**: As above for curbs and gutters including expansion joints, 3" troweled flow lines at base of curb.

D. **Concrete Walks**: Provide 3/8" expansion joints as specified for curbs and where walks abut rigid structures, aligned with joints in curbs where adjoining, an apply a light broom finish perpendicular to traffic direction. Provide scoring as shown or directed.

E. **Control Joints**: Provide for concrete walks and exterior concrete pavement as indicated. Provide "Zip Strip" as distributed by S.C.A., or equal. Install tops of the joints flush with the concrete surface and depth of joint a minimum of 1/4 the thickness of slab.

3.10 MISCELLANEOUS CONCRETE WORK: Provide areaways, cast-in-place valve boxes, pits, splash blocks, bases, and other miscellaneous concrete as shown and required to complete all Work. Conform to applicable requirements herein.

END OF SECTION

SECTION 05500

METAL FABRICATIONS

PART 1 - GENERAL

1.01 DESCRIPTION: Division 1 applies to this Section. Provide miscellaneous metal fabrications as indicated, specified, and required.

A. Work In This Section: Principal items include:

1. Aluminum wall ladder
2. Metal handrails, guardrails and brackets.
3. Pipe railings.
4. Steel curb angle guards.
5. Channel steel frames.
6. Steel pipe bollards.
7. Gratings and frames.
8. Trash enclosure gates.
10. All other miscellaneous metal fabrications required to complete the Work.

B. Related Work Not In This Section:

1. Finish painting.
2. Setting of anchor bolts and inserts in concrete.
3. Steel backing plates.

1.02 QUALITY ASSURANCE:

A. Reference Standards: Conform to the following as applicable:

1. AISC Standards: Code of Standard Practice for Steel Buildings and Bridges; Specification for the Design, Fabrication and Erection of Structural Steel for Buildings; and Steel Construction Manual.
2. AWS Standards: AWS D1.1, Structural Welding Code.

1.03 SUBMITTALS: Refer to Section 01300 for procedures.

A. Shop Drawings: Submit Shop Drawings fully detailing all Work of this Section, including accessories, fastenings, and welding. Include minor connections and fastenings not indicated or specified to meet required conditions; indicate in detail on Shop Drawings.

B. Samples: Submit if required by Architect.

1.04 PRODUCT DELIVERY AND HANDLING: Protect materials from damage during shipping, handling and storage. Work showing dents, creases, deformations, weathering, or other defects is not acceptable. Deliver welding electrodes to site in unbroken packages bearing manufacturer's name and contents identification.

1.05 JOB CONDITIONS: Verify conditions according to Section 01400. Verify all field measurements as required. Report any major discrepancy between the Drawings and field dimensions to Architect before fabrication of Work. Exercise caution to protect concrete floor surfaces and adjacent Work from damage.

PART 2 - PRODUCTS

2.01 BASIC MATERIALS: Furnish materials conforming to the following:

Steel angles and channels:	ASTM A36.
Other steel shapes:	ASTM A36/A572 (fy=50ksi) dual steel or ASTM A572 (fy=50ksi)
Steel tubing:	ASTM A500, ASTM A501, or ASTM A36.
Steel pipe:	ASTM A120 standard weight for general use; ASTM A53 Grade B where used for structural purposes.
Aluminum:	6063-T6 alloy mill finish.
Bolts and nuts:	ASTM A307.
Electrodes:	AWS D5.1, E70XX Series as required for intended uses, unless noted otherwise. E70T-4 electrodes shall not be used.
Primer:	See below paragraph 2.02 (B) or equal.
Non-shrink grout:	Master Builders "Embeco", W. R. Grace "Vibro-foil", or equal.
Galvanizing:	ASTM A123, hot dip, 2.0 ounce psf on actual surface with minimum 1.8 ounce on any specimen.
Galvanizing repair material:	All States Galvanizing Powder, Drygalv by American Solder and Flux, or equal hot applied material, or anodic zinc-rich galvanizing repair paint conforming to MIL-P-21035.

2.02 GENERAL FABRICATION REQUIREMENTS: Conform to the approved submittals, reference standards as applicable to the Work, and the requirements herein. Fabricate and form the Work to meet actual installation conditions as verified at the site. Obtain necessary templates and information and provide all holes and drilling indicated or required for securing Work of other trades to metal fabrications.

A. **Welding**: Conform to AWS D1.1, as modified by referenced AISC Standards, and as indicated or noted on Drawings. Unless otherwise indicated or specified, weld joints by shielded electric-arc method. Grind exposed welds subject to contact to smooth surfaces free of holes, slag, or other defects, flush with adjoining surfaces. No finishing treatment is required for permanently concealed

welds and other exposed welds except as specified herein. Cut out defective welding with chisel or air arc and replace.

B. **Shop Priming**: Clean all exterior exposed steel in accordance with SSPC-SP6 Commercial Blast Clean. Apply Tnemec 90-97 Tneme-Zinc (or approved equal) to all exterior exposed surfaces @ 2.5 to 3.5 mils DFT. 90-97 meets AISC slip coefficient requirements as Class B rating. Clean all interior steel in accordance with SSPC-SP2 Hand Tool Clean and /or SSPC-SP3 Power Tool Clean. Apply Tnemec 10-99 Primer (or approve equal) @ 2.0 to 3.5 mils DFT. Do not prime galvanized items or items embedded in concrete or masonry.

C. **Miscellaneous Items**: Fabricate items not specifically mentioned according to the Drawings, approved Shop Drawings, and as required to complete the entire Work. Galvanize exterior items and shop prime interior items unless otherwise shown or specified.

PART 3 - EXECUTION

3.01 GENERAL INSTALLATION REQUIREMENTS:

A. **Grouting**: Provide grouting for Work of this Section as shown, specified, and required. Use non-shrink grout and conform to manufacturer's directions.

B. **Galvanizing Repair**: Wire brush welds and damaged coating to clean bright metal. Apply one coat of galvanizing repair paint where surfaces are concealed or are to be finish painted. Use the specified hot-applied galvanizing repair compound where surfaces remain exposed and unpainted.

C. **Shop Prime Coat Repair**: Do not apply metal primer in wet weather unless steel is protected from dampness and is dry. Clean field welds, field bolts, and all damaged shop primer after erection and apply a spot coat of the same primer used for the shop coat.

D. **Fasteners**: Provide fasteners and connectors of approved types as required for the installations, whether or not indicated. Provide galvanized fasteners for galvanized items and for exterior use.

3.02 SPECIFIC ITEMS: List of items hereinafter is not necessarily complete. Check all Drawings, other Sections of the Specifications, and with other trades, and provide miscellaneous metal fabrications as required to complete the entire Work.

A. **Aluminum Wall Ladder:** Continuously weld joints and grind smooth and flush. Fixed ladders shall conform to the requirements of CCR Title 8, Section 3277 - Fixed Ladders. Materials to be 3/4" diameter rods at 12" on center for rungs and flat bar 2-1/2" by 3/8" thick for stringers. Fabricate per approved shop drawings. Fabricate and install in accordance with approved shop drawings. Materials to be 384 round rungs secured to metal rails rated at 934 lbs. Shear strength each.

Ladder shall be bolted securely to wall backing. All surfaces shall be clean, smooth and free of burrs and rounds.

B. **Pipe Railings**: Standard weight steel pipe, joints mitered at angles and coped at intersections unless otherwise shown, and continuously welded, welds ground smooth and flush. Provide cast malleable steel brackets with mounting plates for all railings on walls. Return exposed rail ends to walls unless otherwise shown. Galvanize exterior railings only. Handrail brackets is designed based on the use of Julius Blum No. 386, 1386 where galvanized, malleable iron with concealed center fasteners, or approved equal. Locate at 48" on center maximum. Provide backing plate spacer appropriate to substrate and secure to structural substrate with 3/8" diameter bolt as recommended by manufacturer.

C. **Steel Curb Angle Guards**: Provide steel angles guards size and shape as detailed on drawings embedded into concrete.

D. **Channel Steel Frames**: Fabricate from galvanized steel sections to dimensions indicated, miter and weld corners, making all welds continuous, and grind surfaces smooth then redcoat all weld and abraded surfaces with zinc rich compound.

E. **Steel Pipe Bollards**: Fabricate as detailed on drawings using standard-weight (schedule 40) galvanized steel pipe diameter as shown on drawings, set into concrete and filled, round concrete at top to shed water.

F. **Trench Gratings**: By Mc Nichols or Urban Accessories or approved equal, refer to drawings for selections for covers or as selected by Architect with galvanized steel frames, bearing bars spaced for maximum 1/2" clear opening and sized for 100 psf live load. Fabricate gratings in sections weighing not over 75 pounds per panel. The fabrication shall be in accordance with details on the drawings and approved shop drawings.

G. **Enclosure Gates**: Fabricate as detailed, frame to be galvanized steel tube and angles, continuously weld joints and grind smooth and flush. Cover with steel deck material as indicated on drawings. Finish as scheduled or as selected by Architect. Provide hinges, latches, drawbolts, canebolts and embedded items as required.

END OF SECTION

SECTION 06100

ROUGH CARPENTRY

PART 1 - GENERAL

1.01 DESCRIPTION: Division 1 applies to this Section. Provide rough carpentry complete as indicated, specified, and required.

A. Work In This Section: Principal items include:

1. Rough construction wood and plywood framing.
2. Wood blocking, grounds, backing, stripping, cants, and nailers as indicated, specified, or required for securing other Work, except for those items specified to be furnished by other trades.
3. Provide rough hardware incidental to Work of this Section and install steel non-standard framing connectors furnished under Division 5.
4. Wood preservative treatment.

B. Related Work Not In This Section:

1. Concrete forms.
2. Finish carpentry and millwork.
3. Casework and cabinet work.
4. Furnishing of steel non-standard wood framing connectors.

1.02 QUALITY ASSURANCE:

A. Requirements of Regulatory Agencies: Conform to Code for construction, nailing, and connections except as exceeded by requirements on Drawings or specified. All work shall conform to the requirements of Chapter 23 of the 2019 California Building Code, CCR, Title 24, Part 2.

B. Supervision: Perform rough carpentry under the direction of capable experienced foreman.

1.03 PRODUCT DELIVERY AND STORAGE: Store lumber materials, plywood, and metal items off the ground, protected from rain and dampness.

1.04 JOB CONDITIONS: Coordinate with related trades and plan the framing and furring to accommodate structural members, finish materials, piping, conduits, ductwork, mechanical and electrical equipment, accessories, an fixtures.

PART 2 - PRODUCTS

2.01 LUMBER: Douglas fir, Larch, all S4S unless otherwise indicated or specified, manufactured, graded, and bearing grade mark of WCLIB Standard Grading Rules 16 or

WWPA Grading Rules, moisture content at time of installation not over 19% or less than 7%.

A. **Grades**: Use grades as scheduled.

1. Miscellaneous. For blocking and other non-stressed lumber, WCLIB, "No.#2", equivalent WWPA grade, or as scheduled for studs.

B. **Lumber Pressure Preservative Treatment**: Pressure treat all lumber for screeds, cants, grounds, stripping, rough bucks, plates, sills, and the like resting on or against masonry, or concrete, or connected to roofing, in accordance with AWPA Standard C1 and AWPI Standard LP-2, each piece of lumber bearing the mark of an approved testing agency. Deliver to the site at maximum 14% moisture content. When necessary to cut, notch, dap, bore, splice, or frame treated lumber, thoroughly paint newly cut surfaces with same preservative used in treatment of lumber.

C. **Plywood**: Douglas fir plywood conforming to PS 1-current edition, Group I, "Exterior" type, grade marked, grades as noted on Structural Drawings.

2.02 ROUGH HARDWARE: Provide rough hardware required to complete the Work shown and specified. The term "rough hardware" includes bolts, nuts, nails, washers, lag screws, washers, plates, post and beam anchors, joist hangers, framing hangers, wood connectors, and similar items used for construction of rough wood framing. Non-standard steel framing connectors are specified in Division 5 and installed under this Section.

A. **Nails**: Provide common wire nails, sizes as indicated. Conform to CBC 2303.6, 2304.10.1 and 2304.10.2.

B. **Adhesive**: Elastomeric adhesive conforming to American Plywood Assn. Specification AFG-01 for "APA Glued Floor System".

C. **Bolts and Nuts**: ASTM A307, full body diameter (DSA IR 23-5), galvanized for exterior or exposed use. Conform to NDS 11.1.2.1.

D. **Lag Bolts/Screws**: ASME B18.2.1.

E. **Power-Driven Fasteners**: CABO NER-272.

F. **Washers**: As noted on Drawings, galvanized for exterior or exposed use.

G. **Stock Framing Connectors**: By "Simpson", or equal, types indicated or required, galvanized, with nails furnished by manufacturer. Fully drive nails in all holes. If other than Simpson connectors are proposed for use, submit Code approval catalog data with proposed substitutions circled.

PART 3 - EXECUTION

3.01 GENERAL: Fabricate, install, connect and fasten, bore, notch, and cut wood and plywood framing with joints true, tight, and well-nailed, screwed, or bolted as required, all members with solid bearing without being shimmed. Set horizontal members subject to bending with crown up. Install framing plumb, square, true, and cut for full bearing. Splices are not permitted between bearings. Use full lengths except as detailed. The notching, drilling, splicing, or cutting of any structural member is not permitted without prior approval. Reinforce or replace wood framing members damaged by erroneous cutting as directed. Perform cutting for other trades under their direction. Wherever necessary to avoid splitting, sub-drill for nails and screws with diameter of hole smaller than that of nails or screws.

3.02 NAILING: Use nails or spikes of such lengths that penetration into second piece of wood is not less than one-half the nail or spike length, except 16d nails may be used to connect pieces of 2" nominal thickness. Set nails no closer together than one-half nail length, nor closer to wood edges than one-fourth nail length. Sub-drill holes where necessary to prevent splitting. Demonstrate satisfactory installation of machine nailing at the site and obtain approval by Architect or Structural Engineer before using machine applied nails; such approval is subject to continued satisfactory performance.

3.03 LAG SCREWS. Place by screwing; do not hammer drive into place. Install screws with anchorage embedment in piece lagged of not less than 60% of screw length or 8 diameters. Provide standard malleable iron or steel plate washer under heads. Bore a hole of same diameter and depth as shank. For threaded portion of screw, bore the hole with a bit not larger than base of thread.

A. Lag Screws:

1. When installing lag screws in a wood member, pre-drill hole as recommended by CBC.
2. Lag screws, which bear on wood, shall be fitted with standard steel plate washers under head. Lag screws shall be screwed and not driven into place.

3.04 BOLTS: Clamp members together and bore holes true to line and 1/32" larger than bolt diameter. Provide standard malleable iron or steel washers under heads and nuts when bearing on wood. Draw nuts up tight as installed and again just prior to being enclosed with other materials or at completion.

A. Bolts:

1. Lumber and timber to be fastened together with bolts shall be clamped together with holes for bolts bored true to line.
2. Bolts shall be fitted with steel plates or standard cut washers under heads and nuts. Bolts shall be tightened when installed and again before completion of the Work of this section.

3.05 WOOD SCREWS: When installing wood screws, pre-drill holes as recommended by CBC/UBC.

3.06 FRAMING ANCHORS: Framing anchors, joist hangers, ties, and other mechanical fastenings shall be galvanized or furnished with a rust inhibitive coating. Nails and fastenings shall be of the type recommended by manufacturer.

3.07 SILLS ON CONCRETE: Anchor as indicated or required by Code. Tighten with washers and nuts to level bearing. Use pressure treated lumber. All fasteners less than 1/2" diameter and into pressure treated lumber shall be hot dipped galvanized. In addition, all framing hardware attached to pressure treated lumber shall be hot dipped galvanized (including Simpson 'ZMAX') or stainless steel connectors.

3.08 STUD WALLS, PARTITIONS AND FURRING:

A. **Wood stud walls, partitions** and vertical furring shall be constructed of members of size and spacing indicated. Provide single plate at bottom and double plate at top unless otherwise indicated. Interior, nonbearing non-shear partitions may be framed with a single top plate, installed to provide overlapping at corners and at intersections with other wall and partitions or by metal ties as detailed.

B. **Walls and partitions shall be** provided with horizontal staggered blocking at least 2" nominal thickness and same width as studs, fitted snugly, and nailed into studs. Blocking shall be installed at mid-height of partition or not more than 7 feet on center vertically. Install wood backing on top of top plate wherever necessary for nailing of lath or gypsum board.

C. **Walls, partitions and furred** spaces shall be provided with 2" nominal thickness wood firestops, same width as space to be firestopped, at ceiling line, mid-height of partition and at floor line. Firestops at floor line are not required when floor is concrete. If width of opening is such that more than one piece of lumber is necessary, provide 2 thicknesses of one inch nominal material installed with staggered joints.

D. **Firestops shall be installed** in stud walls and partitions, including furred spaces, so the maximum dimension of any concealed space is not over 10 feet.

E. **Corners, and where wood** stud walls and wood vertical furring meet, shall be constructed of triple studs. Openings in stud walls and partitions shall be provided with headers as indicated and a minimum of 2 studs at jambs, one stud of which may be cut to support header in bearing.

F. **Where wood** or concrete walls intersect, end stud shall be fastened at top, bottom and mid-height with one 1/2" diameter bolt through stud and embedded in masonry or concrete a minimum of 4". Bolts shall be provided with washers under nuts.

G. **Sills under bearing, exterior** or shear walls shall be bolted to concrete with 5/8" diameter x 12" long bolts spaced not more than 6 feet on center, unless noted otherwise on the structural drawings. There shall be a bolt within 9" of each end of each piece of sill plate. Sills shall be installed and leveled with shims, washers, with nuts tightened to level bearing. Space between sill and concrete shall be dry packed with cement grout.

3.09 CEILING FRAMING: Provide joists as shown, placed with crowning edge up. Conform to the following requirements unless otherwise indicated.

A. **Ceiling Framing**:

1. Wood joists shall be of the size and spacing indicated, installed with crown edge up, and shall have at least 4" bearing at supports. Provide 2" solid blocking, cut in between joists, same depth as joists, at ends and bearings, unless otherwise indicated.
2. Joists under and parallel to bearing partitions shall be doubled and nailed or bolted together as detailed. Whenever a partition containing piping runs parallel to floor joists, joists underneath shall be doubled and spaced to permit passage of pipes and blocked with solid blocking spaced at not more than 4 feet intervals.
3. Trimmer and header joists shall be doubled, when span of header exceeds 4 feet. Ends of header joists more than 6 feet long shall be supported by framing anchors or joist hangers unless bearing on a beam, partition, or wall. Tail joists over 12 feet long shall be supported at header by framing anchors or on ledger strips at least 2 x 4.
4. Provide solid blocking between rafters and ceiling joists over partitions and at end supports where indicated.

B. **Beams, Girders and Joists**:

1. Ends of wood beams, girders and joists which are 2 feet or less above finished outside grade and which abut, but do not enter concrete or masonry walls, as well as wood blocking used in connection with ends of those members shall be treated with wood preservative.
2. Where wood beams, girders and joists enter masonry or concrete walls 2 feet or less above outside wall, metal wall boxes or equivalent moisture barriers shall be provided between wood and masonry or concrete.

C. **Bridging**: Provide 2" solid wood blocking, cut in between joists for same depth as joist, as indicated. Metal cross-bridging may be used in lieu of wood cross bridging, spacing same as wood bridging.

3.10 NAILING STRIPS AND PLATES: Provide wood nailing strips, plates, and blocking as shown or required, securely nailed or screw fastened in place. Bolt wood strips and plates to metal. Use treated lumber for members on concrete or masonry.

3.11 WOOD BACKING OR PLATFORMS: Provide wood backing and roof 2x shaped member platform frames to receive mechanical or electrical fixtures and equipment, bases, cabinets, door stops, wall plates, toilet accessories and partitions, and other fixed equipment, as indicated or required, securely nailed or screw fastened to framework. Coordinate locations with related trades.

END OF SECTION

SECTION 06200

FINISH CARPENTRY

PART 1 - GENERAL

1.01 DESCRIPTION: Division 1 applies to this Section. Provide and perform finish carpentry complete as indicated, specified, and required.

A. Work In This Section: Principal items include:

1. Installation of hollow metal doors and metal frames.
2. Installation of finish hardware except as otherwise specified.

B. Related Work Not In This Section:

1. Finish painting.
2. Furnishing hollow metal doors and metal frames.
3. Furnishing finish hardware for doors.

1.02 QUALITY ASSURANCE: Work of this Section shall conform to the Manual of Millwork of the Woodwork Institute (WI), Current Edition, or Architectural Woodwork Institute, (AWI), Current Edition, grades as specified herein or indicated. Prior to delivery to site, submit WI Certified Compliance Certificates indicating each millwork product for the Work and that all products will fully conform to the WI grades and other requirements shown and specified.

1.03 SUBMITTALS: Refer to Section 01300 for procedures.

A. Samples and Product Data: Submit the following for selection and approval:

1. Adhesive. Approved type for required installation.

PART 2 - PRODUCTS

2.01 MATERIALS AND MANUFACTURER: Conforming to WI Manual unless otherwise specified. Details on Drawings and requirements specified herein govern arrangement, sizes, construction, and fabrication. In all other respects, manufacture Work of this Section to conform to the WI grades specified.

A. Adhesive: Approved type for required installation.

PART 3 - EXECUTION

3.01 INSTALLATION OF FINISH CARPENTRY:

A. **General**: Conform to Drawings, approved submittals, and Section 26 of the WI Manual. Repair all damage as approved.

B. **Telephone and/or Electrical Backboards**: Install Grade B-B Exterior (fire rated) plywood panels, 3/4" thick by 8-feet high. Secure to walls with stripes of contact adhesive and molly-bolts at 24" centers around perimeter of each panel. Run backboards from top of wall base.

3.02 INSTALLATION OF HOLLOW METAL WORK: Conform installation to submittals approved under Section 08110 and manufacturer's instructions. Install all frames plumb, straight, in true alignment, rigidly connected to walls and building structure. Erect in proper sequence with other trades to prevent delays. Erect within the tolerances specified or shown in the approved submittals.

3.03 INSTALLATION OF FINISH HARDWARE: Install hardware supplied under Section 08710, excluding only hardware specified to be installed at the factory or under other Sections. Drill pilot holes for screws and screw home; hammer driving of screws is not allowed. After installation and fitting, remove finish hardware items on surfaces to be painted, except prime coat items, repack in original containers, and perform final installation, testing, and adjustment after finish painting is completed. Adjust hinges to swing smoothly but not loosely, without sticking or hinge-bound conditions. Adjust other hardware for correct operation.

END OF SECTION

SECTION 07210

BUILDING INSULATION

PART 1 - GENERAL

1.01 DESCRIPTION: Division 1 applies to this Section. Provide building insulation complete as indicated, specified, and required.

A. Work In This Section: Principal items include:

1. Thermal batt insulation for walls at infill areas where indicated on drawings.
2. Semi-rigid board type insulation on ceilings of scheduled rooms and spaces where indicated.

B. Related Work Not In This Section:

1. Sound insulation in interior partitions in Section 09250.
2. Insulation for mechanical systems in Division 15.

1.02 SUBMITTALS: Refer to Section 01300 for procedures. Submit insulation and prong anchor manufacturers' printed specifications and instructions.

PART 2 - PRODUCTS

2.01 FORMALDEHYDE-FREE INSULATING MATERIALS:

A. Thermal Batt Insulation: Per ASTM C665, Type III, Class A labeled flame spread of 25 or less where exposed or required by Code the greater of, R-19 in walls unless otherwise indicated or required by Code, PSK facing batts with flanges for use under roof decks and friction-fit batts for use in studs and metal framing. Type II batts with kraft facing to be used in areas enclosed by incombustible finish materials provided such batts and usage are approved by Building Department.

B. Semi-Rigid Board Insulation: Owens-Corning Fiberglass Series 703 thermal insulation labeled flame spread of 25 or less per ASTM C612-83, thickness indicated. (Foil faced or not as required for installation).

C. Staples: Stainless steel, monel, or copper-coated steel, size directed by batt manufacturer.

D. String Wires: Minimum 18 gage galvanized steel wire.

PART 3 - EXECUTION

3.01 INSTALLATION OF BATTS: Install all batts with close fit, free of gaps, holes, or sagging. Maintain a nominal 3/4" air space between insulation and interior wall or ceiling finish material. Staple flanges at 4" centers and ensure batt facings form a continuous vapor barrier. Provide taut stretched string wires along the center of horizontal or sloping batts where support spacing exceeds 16" on centers.

A. Framing: Provide friction-fit batts, tightly fitted to stud webs and wood furring.

3.02 INSTALLATION OF SEMI-RIGID INSULATION: Install boards in maximum feasible sizes with prong anchors located within 4" of corners and spaced at not more than 12" centers along edges and in the field.

END OF SECTION

SECTION 07600

SHEET METAL

PART 1 - GENERAL

1.01 DESCRIPTION: Division 1 applies to this Section. Provide sheet metal items complete as indicated, specified, and required.

A. Work In This Section: Principal items include:

1. Sheet metal flashings in connection with roofing.
2. Reglet, reveals and counterflashing assemblies.
3. Miscellaneous metal flashing and counterflashing as required, except where provided by mechanical and electrical trades.
4. Shop priming and field touch-up.
5. Caulking.

B. Related Work Not In This Section:

1. Sheet metal in connection with Plumbing, Air Conditioning, and Electrical.
2. Metal accessories for drywall, lathing, and acoustical treatments.
3. Finish painting.
4. Sleeves for embedded items.

1.02 QUALITY ASSURANCE: Drawing details and requirements herein govern. Conform to the current "Architectural Sheet Metal Manual" published by Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA), for conditions not indicated or specified and for general fabrication of sheet metal items.

1.03 SUBMITTALS: Refer to Section 01300 for procedures.

A. Shop Drawings: Submit for fabricated sheet metal showing details, methods of joining, anchoring and fastening, thicknesses and gages of metals, concealed reinforcement, expansion joint details, sections, and profiles.

B. Samples and Product Data: Submit Samples and data for materials or assemblies as Architect may request.

PART 2 - PRODUCTS

2.01 BASIC MATERIALS:

Galvanized steel: ASTM A525, coating G90, mill phosphatized for paint adhesion, 24 gage unless otherwise indicated or specified.

Lead:	FSQQ-L-201 4 lbs. sheet lead
Copper:	ASTM B370, 16 oz. minimum unless otherwise indicated on drawings.
Solder:	ASTM B32, B284.
Solder flux:	Standard brand non-corrosive acid-base type.
Fasteners:	Zinc or cadmium coated steel or stainless steel.
Felt:	ASTM D226, 15-pound type.
Primer:	Approved brand of zinc-dust zinc-oxide primer per Section 09900 with manufacturer's pretreatment materials.
Sealant:	Conforming to Section 07900.

2.02 RELATED MATERIALS:

A. **Reglets, Reveals and Counterflashings**: Fry Reglet Corp. flashing systems complete with unions and preformed corners of necessary types for particular locations, of 24 gage galvanized steel, or approved equals by Metco Metal Products Co., Pacific Loxtite Flashing Co., National Cornice Works, Redco, Lane-Air, or equal. Use single manufacturer's products throughout equivalent to Type CO at concrete, Type MA at masonry, Type ST at plaster, or Type SM, as required by Drawings and details.

2.03 GENERAL FABRICATION REQUIREMENTS: Fabricate to avoid distortion and overstress of fastenings due to expansion and contraction. Provide expansion joints where necessary in continuous runs of sheet metal, constructed watertight and spaced 30 feet apart maximum. Lock and solder corners and blind hem exposed edges. Make joints with 4" lap and solder unless otherwise shown or specified. Fill single lock seams with sealant where soldering is not feasible. Extend flanges 4" minimum onto roof and wall surfaces. Fabricate sheet metal items in nominal 8-foot lengths unless otherwise shown or specified.

A. **Soldering**: Do soldering slowly, immediately after application of flux, seams showing evenly flowed solder. Clean and neutralize finished soldering.

B. **Shop Priming**: Clean completed items, apply pretreatment, and prime all exposed surfaces with specified primer.

2.04 FABRICATED ITEMS: Of 24 gage galvanized steel except as otherwise indicated or specified.

A. **Custom Fabricated Items**: Fabricate as detailed on drawings from materials as indicated on drawings, provides shop drawings for Architects approval prior to fabrication.

PART 3 - EXECUTION

3.01 GENERAL INSTALLATION REQUIREMENTS: Install metal items as indicated, according to approved submittals, and as required to complete the Work. Securely fasten and assemble, and make watertight and weathertight.

A. **Coordinate Sheet Metal Items** in connection with roofing for proper installation, and furnish in sufficient time to avoid delay in roofing construction. Install roofing sheet metal simultaneously with roofing.

B. **Caulking**: Provide sealant caulking as indicated and required to seal and complete Work of this Section. Conform to Section 07900.

C. **Isolation**: Isolate sheet metal from contact with concrete or masonry with one layer of roofing felt, except embedded items.

3.02 COMPLETION: Examine installed sheet metal, water test if necessary or directed, and correct damaged or defective items.

END OF SECTION

SECTION 07900

CAULKING AND SEALANTS

PART 1 - GENERAL

1.01 DESCRIPTION: Division 1 applies to this Section. This Section covers caulking of openings and joints indicated, specified, and required to make the entire building weatherproof and watertight, covers caulking requirements for the entire Work, and pertains to any Section requiring caulking, unless specified otherwise. Provide where required paintable acrylic caulking materials, refer to Section 09900 Painting. Coordinate with Firestopping Section 07270 for fire rated joint materials.

1.02 QUALITY ASSURANCE: Employ a specialist caulking contractor having not less than 5 years experience in caulking installations of size and complexity required for the Work. Prior to award of any subcontract for caulking, submit qualifications and project history of the proposed Caulking Subcontractor, including bid price information. If proposed Caulking Subcontractor is not approved, provisions of the General Conditions will apply.

1.03 SUBMITTALS: Refer to Division 1 for procedures.

A. Samples and Data: Submit the following:

1. Samples of cured sealants showing full range of designated colors; obtain color instructions from Architect prior to submittal.
2. Technical data by manufacturers of proposed materials.
3. Material manufacturers' printed preparation and application instructions; when approved, furnish copies to other trades.

1.04 PRODUCT DELIVERY: Deliver caulking and sealant materials in unopened factory labeled containers, each label bearing statement of conformance to standards specified for each material.

1.05 WARRANTY: Refer to Division 1. Furnish a written warranty against defects in materials for 5 years and defects in workmanship for 2 years, covering all loss of adhesion or cohesion, deterioration, color changes, leaking, and other defects.

PART 2 - PRODUCTS

2.01 MANUFACTURERS: Provide sealants by Pecora Corporation or one of the following manufacturers; Dow Corning, Tremco, Sonneborn, General Electric and Johns Manville or approved equals. Obtain each type of joint sealant through one source from a single manufacturer. If sealants from separate manufacturers must be used and could come in contact with each other, provide written certification from every manufacturer involved that the sealants are compatible and will adhere to each other.

2.02 MATERIALS: Furnish sealants meeting following in-service requirements: Normal curing schedules are acceptable; Non-staining, color fastness (resistance to color change), and durability when subjected to intense actinic (ultra-violet) radiation are required. Furnish the products of only one manufacturer unless otherwise approved, sealant colors as selected to match the adjoining surfaces; special colors may be required. Use sealants selected from the following types where required on drawings and as appropriate to the joint being sealed. The manufacturer shall confirm that the appropriate caulking or sealant(s) are used for on each type application required.

A. **Type A Sealant**: Urexpan NR-200 Sealant, self-leveling or non-sag two-part urethane Type I, conforming to FS SS-T-00227 and ASTM D1850 as manufactured by Pecora or approved equal.

B. **Type B Sealant**: Dyntrol II Sealant, three-part polyurethane sealant conforming to FS SS-T-00227 Type II, Class A as manufactured by Pecora or approved equal.

C. **Type C Sealant**: Pecora 895 or 896 for door and window frames (all types) in stucco areas all conforming to FS TT-S-001543A and FS TT-S-00230C or approved equal.

D. **Type D Sealant**: Dynatrol I-XL polyurethane conforming to FS TT-S-00230C, Type II, Class A by Pecora or approved equal.

E. **Type E Sealant**: 898 Sanitary Silicone Sealant with mold inhibitors, as manufactured by Pecora or approved equal.

F. **Type F Sealant**: Pecora AC-20 FTR Firestopping Systems by Pecora or Type 3-6548 Silicone RTV foam as manufactured by Dow Corning or RTV850 as manufactured by General Electric or Fire Resistive Joint Sealing System as manufactured by Trimco with backup of Cerablanket-FS backups, primers and bond breakers as manufactured by Johns Manville.

G. **Type G Sealant**: Proglaze System, including silicone construction sealant, Polyslim Tape, Poly-Wej gasket, Aro-Shim spacer and CCN sponge, as manufactured by Trimco or approved equal.

H. **Type H Sealant**: AC-20 FTR AIS-919 Acoustical and Insulation Latex Sealants by Pecora or approved equal.

I. **Type I Sealant**: Pecora 895 or approved equal.

J. **Type J Traffic Bearing Application**: Furnish multi-component self leveling, or non-sag, non-tracking sealant with Shore "A" Hardness range of 40 to 55 where subject to foot or vehicular traffic, meeting requirements of ASTM 920-79 or Federal Specification TT-S-227E, "Sealing Compound, Elastomeric Type, Multi-Component".

1. Dynatred, by Pecora. [Shore A hardness of 40-45]
2. Dynaflex, by Pecora. [Shore A hardness of 50-55]

K. **Type K Window Flashing Sealant:** Furnish single-component, non-sag STPU hybrid sealant compatible with asphalt-impregnated window flashing paper and/or rubberized asphalt with polyethylene film (peel-n-stick) meeting requirements of ASTM C-920 or Federal Specification TT-S-230C.

1. Dynaflex SC, by Pecora
2. Sonolastic 150, by Sonneborn

L. **Sealant Primer**: Non-sagging sealant meeting requirements of ASTM C920-79. Sealant primer as recommended by sealant manufacturer.

M. **Joint Cleaner**: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.

N. **Joint Backing Material**: ASTM D1056 or ASTM D1565; round, closed cell polyethylene urethane or neoprene foam rod; oversized 30 to 50 percent larger than joint width; #92 Closed-Cell Polyethylene Backer Rod by Pecora.

O. **Bond Breaking**: Pressure sensitive tape as recommended by sealant manufacturer to suit application.

PART 3 - EXECUTION

3.01 INSPECTION: Refer to Division 1. Inspect surfaces and joints to be calked. Report to Architect in writing all conditions that prevent correct preparation, priming, and caulking installation.

3.02 TECHNICAL ASSISTANCE: Furnish sealant manufacturer's technical field assistance as required to ensure proper use of sealants, preparation, and application.

3.03 PREPARATION AND PROTECTION: Conform to sealant manufacturer's instructions and apply materials to clean dry surfaces free of grease, oil, wax, or other matter that destroys or impairs adhesion. Remove lacquer and apply temporary masking tape on both sides of joints where surface staining may occur. Fill joints with joint backing material until the joint depth does not exceed 50% of joint width. Provide bond breaker to prevent bonding of sealant to backing material wherever joints exceed 1/2" width, or joint width is shown or required to exceed depth. Prime surfaces as required by manufacturer's instructions.

3.04 APPLICATION: Do not exceed 3/8" sealant depth unless specifically dimensioned. Minimum joint width is 1/8" for metal to metal joints and maximum 3/4" width elsewhere unless otherwise shown. Apply all sealant under sufficient pressure to fill voids. Finish exposed joints smooth and flush with adjoining surface unless recessed joints are shown. Remove temporary masking as soon as joint is completed.

3.05 SCHEDULE: Sealants shall conform to the following application schedule, unless the manufacturer requires another type of material.

A.	**Expansion and Control Joints in Masonry and Concrete**.	- Type B.
B.	**Expansion and Control Joints in Glass, Aluminum and Plastic**.	- Type C.
C.	**Expansion and Control Joints in Horizontal Traffic Surfaces**.	- Type J
D.	**Nonexpanding Joints in Concrete, Masonry, Aluminum, Steel and Wood**:	- Type D
E.	**Nonexpanding Joints in Glass and Plastic**:	- Type C
F.	**Around Plumbing Fixtures in Toilet and Bath**:	- Type E
G.	**Mechanical, Ductwork and Air Conditioning**:	- Type D
H.	**Acoustical Applications**:	- Type H
I.	**At Floor, Wall and Ceiling Penetrations Requiring Vibration Isolation, Sound or Fire Rating**:	- Type F
J.	**At Window Wall Where Channel Glazing is Required**:	- Type I
K.	**Cross Joints in all Copings**:	- Type D
L.	**Any Gypsum Board Joints and/or Settings**:	- Type D
M.	**For Sink, Tub or Bath Areas Including Countertop Joints**:	- Type E
N.	**Intersection of Wall Surface and Metal Cap Strip at Resilient Flooring Integral Cove Sealant**:	- Type D
O.	**Traffic Bearing Application**:	- Types A or J
P.	**Sealant at Doors, Windows and Penetrations in Other Material Application**:	- Types C
Q.	**Seal at back of window nailing flange to rough opening and at transition to window flashing material**:	- Type K

3.06 CLEANING: Clean material from surfaces not to receive sealant and restore the finish as required. If surfaces adjoining joints are stained and cleaning is not acceptable, remove the affected Work and provide new Work as directed and approved, at no extra cost to Owner.

END OF SECTION

SECTION 08110

HOLLOW METAL

PART 1 - GENERAL

1.01 DESCRIPTION: Division 1 applies to this Section. Provide hollow metal items complete as indicated, specified, and required.

A. Work In This Section: Principal items include:

1. Hollow metal frames.
2. Hollow metal frames for glazed wall openings.

B. Related Work Not In This Section:

1. Installation of hollow metal frames.
2. Glazing in hollow metal.
3. Grouting or back-plastering of hollow metal frames.

1.02 QUALITY ASSURANCE:

A. Requirements of Regulatory Agencies: Construct labeled openings in accordance with SDI Standards and Specifications, ANSI/SDI-100 and manufacturer's standard procedures filed with and approved by UL. In accordance with NFPA provide required UL labels on doors and frames.

B. Tolerances: Provide hollow metal door and frame assemblies having maximum 3/32" gap between top and side edges of wider door face and frame after installation, and maximum 1/4" clearance above finish floor except as otherwise required by floor finish material; provide maximum 3/32" gap between door edges at meeting stiles of pairs of doors.

1.03 SUBMITTALS: Refer to Section 01300 for procedures.

A. Shop Drawings: Submit Shop Drawings fully detailing materials, finishes, sizes, profiles, moldings, location of hardware items with reinforcement, and methods for anchoring, assembly, and erection.

B. Samples: Submit Samples if requested by Architect:

C. Product Data: Submit if required by the Architect.

PART 2 - PRODUCTS

2.01 MATERIALS: As supplied by one of following manufacturers subject to conformance

with requirements herein; refer to Section 01600 for substitutions:

1. Overly Manufacturing Co.
2. Krieger Steel Products Co.
3. Steelcraft Manufacturing Co.
4. Ceco Steel Products Corporation

A. **Types**: The sizes, types, thicknesses, profiles, details, and features indicated for doors and frames govern. In all other respects, provide doors and frames as standard with manufacturer except as specified herein. Where doors and frames are to be exterior type, provide galvanized steel in lieu of steel.

B **Hollow Metal Frames**: Form the stops integral with frames. Reinforce heads over 42" wide with a full-length 12 gage channel. Provide galvanized steel plaster guards back of cutouts for hinges or mortised hardware on frames installed in concrete, masonry, or plaster. Fabricate frames of 16 gage steel unless noted otherwise below. Weld all joints, ground smooth and flush.

1. Frames minimum 16 gage steel, unless otherwise noted.
2. Frame Anchors: Provide steel anchors of proper type for each wall construction of 18 gage minimum, each anchor prepared for not less than two fasteners where connected to wall studs, not less than three anchors per jamb except, if frame height exceeds 84” add one additional anchor for each 18” of frame height or fraction thereof. Provide anchors welded into frame except provide adjustable type frame anchors for frames installed in masonry. Provide floor anchors where mortar setting beds or concrete floor fill occurs.
   a. Where new frames are anchored to new construction, secure with flat head screws in dimpled holes at not over 18” o.c. Tackwell fasteners to frame, grind smooth, fill with bondo, sand and prep for painting.

C. **Glazed Wall Opening Frames**: Fabricate of minimum 18 gage steel, welded joints, all exposed welds ground smooth and flush. Fabricate applied stops of minimum 20 gage steel, one piece lengths, secured with 3" of ends and at 12" centers with oval-head screws.

D. **Hardware Preparation**: Prepare, reinforce, mortise, drill, and tap the doors and frames according to the templates supplied by the hardware supplier, reinforcing as standard with door and frame manufacturer except minimum 10 gage steel behind butts and 12 gage steel for mortised or surface-applied hardware. Conform to ANSI A115 Series as applicable to the hardware specified in Section 08710 unless otherwise indicated.

1. Steel Reinforcing: ASTM A36.
2. Door Bumpers or Silencers: Per ANSI A156.16.

E. **Finish**: Thoroughly clean all surfaces and chemically treat for paint adhesion. Paint inaccessible surfaces before assembling. Sand exposed surfaces of hollow metal and accessories and make smooth with mineral filler as required. Apply a baked-on coat of manufacturer's standard rust inhibitive primer, including all interior surfaces of door frames.

PART 3 - EXECUTION

3.01 EXAMINATION: Examine supporting structure and conditions under which hollow metal is to be installed. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. **Install hollow metal in accordance** with reviewed shop drawings and manufacturer's printed instructions. Securely fasten and anchor work in place without twists, warps, bulges or other unsatisfactory or defacing workmanship. Set hollow metal plumb, level, square to proper elevations, true to line and eye. Set clips and other anchors with Ramset "shot" anchors or drill in anchors as approved. Units and trim shall be fastened tightly together, with neat, uniform and tight joints.

B. **Placing Frames**: Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces and spreaders leaving surfaces smooth and undamaged. In masonry construction, building-in of anchors and grouting of frames with mortar is specified in Section 04220 - Concrete Unit Masonry. At in-place concrete or masonry construction, set frames and secure in place using countersunk bolts and expansion shields, with bolt heads neatly filled with metallic putty, ground smooth and primed.

C. **Place fire-rated frames** in accordance with NFPA Standard #80.

3.03 ADJUSTING AND CLEANING

A. **Prime Coat Touch-Up**: Immediately after installation, sand smooth rusted or damaged areas of prime coat and apply touch-up of compatible air-drying primer.

B. **Protection Removal**: Immediately before final inspection, remove protective wrappings from doors and frames.

END OF SECTION

SECTION 08710

FINISH HARDWARE

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Door Hardware, including electric hardware.
2. Entrance door hardware.
3. Gate Hardware.
4. Wall or floor-mounted electromagnetic hold-open devices.
5. Power supplies for electric hardware.

B. Related Sections:

1. Section 06200 - Finish Carpentry: Finish Hardware Installation.
2. Section 07900 - Joint Sealers – exterior thresholds.
3. Section 08110 - Hollow Metal.
4. Section 09100 - Access Doors.

C. Specific Omissions: Hardware for the following is specified or indicated elsewhere.

1. Windows.
2. Cabinets, including open wall shelving and locks.
3. Signs, except where scheduled.
4. Toilet accessories, including grab bars.
5. Installation.
6. Rough hardware.

1.02 REFERENCES:

A. Use date of standard in effect as of Bid date.
B. American National Standards Institute - ANSI 156.18 - Materials and Finishes.
C. ANSI A117.1 - Specifications for making buildings and facilities usable by physically handicapped people.
D. ADA - Americans with Disabilities Act of 1990
E. BHMA - Builders Hardware Manufacturers Association
F. CBC – California Building Code, Latest Edition (2019) CBC Section 1133B, 1104B.3.12 and 1003.3.1.8.
G. DHI - Door and Hardware Institute.
H. NFPA - National Fire Protection Association
1. NFPA 80 - Fire Doors and Windows
2. NFPA 101 - Life Safety Code

3. NFPA 105 - Smoke and Draft Control Door Assemblies
4. NFPA 252 - Fire Tests of Door Assemblies

I. UL - Underwriters Laboratories
1. UL 10C - Fire Tests of Door Assemblies (Positive Pressure)
2. UL 305 - Panic Hardware

J. WHI - Warnock Hersey Incorporated

K. (Not used.)

L. SDI - Steel Door Institute

M. WDI - Wood Door Institute

N. AWI - Architectural Woodwork Institute

O. NAAM - National Association of Architectural Metal Manufacturers

1.03 SUBMITTALS & SUBSTITUTIONS

A. **SUBMITTALS**: Submit six copies of schedule per Division 1. Organize vertically formatted schedule into "Hardware Sets" with index of doors and headings, indicating complete designations of every item required for each door or opening. Include following information:

1. Type, style, function, size, quantity and finish of hardware items. Use BHMA Finish codes per ANSI A156.18.
2. Name, part number and manufacturer of each item.
3. Fastenings and other pertinent information.
4. Location of hardware set coordinated with floor plans and door schedule.
5. Explanation of abbreviations, symbols, and codes contained in schedule.
6. Mounting locations for hardware.
7. Door and frame sizes, materials and degrees of swing.
8. List of manufacturers used and their nearest representative with address and phone number.
9. Catalog cuts.
10. Manufacturer's technical data and installation instructions for electronic hardware.

B. **Bid and submit** manufacturer's updated/improved item if scheduled item is discontinued.

C. **Make substitution requests** in accordance with Division 1. Include product data and indicate benefit to the Project. Furnish operating samples on request.

D. **Furnish as-built/as-installed** schedule with close-out documents, including keying schedule, wiring/riser diagrams, manufacturers' installation, adjustment and maintenance information, and supplier's final inspection report.

1.04 QUALITY ASSURANCE:

A. Qualifications:

1. Hardware supplier: direct factory contract supplier who employs a certified architectural hardware consultant (AHC), available at reasonable times during course of Work for project hardware consultation to Owner, Architect, and Contractor.
   (1) Responsible for detailing, scheduling and ordering of finish hardware.

B. Hardware: New, free of defects, blemishes and excessive play. Obtain each kind of hardware (latch and lock sets, exit devices, hinges, and closers) from one manufacturer.

C. Exit Doors: Operable from inside with single motion without the use of a key or special knowledge or effort. Alarmed units shall be supplied with two switches. One switch to monitor the push rail and the other switch to monitor the latch bolt for full proof security.

D. Fire-Rated Openings: In compliance with NFPA 80. Hardware UL10C / UBC-7-2 (positive pressure) compliant for given type/size opening and degree of label. Provide proper latching hardware, non-flaming door closers, approved-bearing hinges, plus resilient and intumescent seals. Furnish openings complete.

E. Pre-Installation Meetings: Initiate and conduct with supplier, installer and related trades, coordinate materials and techniques, and sequence complex hardware items and systems installation. Convene at least one week prior to commencement of related work.

1.05 DELIVERY, STORAGE, AND HANDLING:

A. Delivery: coordinate delivery to appropriate locations (shop or field).

1. Permanent keys and cores: secured delivery direct to Owner's representative.

B. Acceptance at Site: Items individually packaged in manufacturers' original containers, complete with proper fasteners and related pieces. Clearly mark packages to indicate contents, locations in hardware schedule and door numbers.

C. Storage: Provide locked storage area for hardware, protect from moisture, sunlight, paint, chemicals, etc.

1.06 PROJECT CONDITIONS:

A. **Where exact types** of hardware specified are not adaptable to finished shape or size of members requiring hardware, provide suitable types having as nearly as practical as the same operation and quality as type specified, subject to Architect's approval.

1.07 SEQUENCING AND COORDINATION:

A. **Coordinate** with concrete.

B. **Reinforce** walls.

C. **Coordinate** finish floor materials and floor-mounted hardware.

D. **Conduit and raceways** as needed for electrical, electronic and electro-pneumatic hardware items. Fire/life-safety system interfacing. Point-to-point wiring diagrams plus riser diagrams to related trades.

E. **Furnish manufacturers** templates to door and frame fabricators.

F. **Use hardware consultant** to check Shop Drawings for doors and entrances to confirm that adequate provisions will be made for proper hardware installation.

1. Confirm that door manufacturers furnish necessary UBC-7-2 compliant seal packages.

1.08 WARRANTY:

A. **Part of respective manufacturers'** regular terms of sale. Provide manufacturers' warranties:

1.	Closers:	Ten years mechanical.
2.	Exit Devices:	Three years.
3.	Hinges:	Life of Building.
4.	Other Hardware:	Two years.

1.09 COMMISSIONING:

A. **Test door hardware** operation with climate control system and stairwell pressurization system both at rest and while in full operation.

B. **Test electrical,** electronic and electro-pneumatic hardware systems for satisfactory operation.

C. **Test hardware interfaced** with fire/life-safety system for proper operation and release.

1.10 MAINTENANCE:

A. **Extra Materials**: Provide 5% or a minimum of one, whichever is greater, additional hardware items: locksets, exit devices, closers and electronic hardware. See schedule under "Miscellaneous Material".

PART 2 - PRODUCTS

2.01 MANUFACTURE: Refer to Drawings.

2.02 MANUFACTURERS:

A. **Listed acceptable alternate manufacturers**: submit for review products with equivalent function and features of scheduled products.

Item:	Manufacturer:	Acceptable Sub:

Provide by the Drawings for selections.

B. **Provide hardware items** required to complete the Work in accordance with these specifications and manufacturers' instructions, including items inadvertently omitted from this specification. Note these items in submittal for review.

2.03 HANGING MEANS:

A. **Conventional Hinges**: Hinge open widths minimum, but of sufficient throw to permit maximum door swing. Steel or stainless-steel pins and concealed bearings.

1. Three hinges per leaf to 7 foot, 6 inch height. Add one for each additional 30 inches in height or fraction thereof.
2. Extra heavy weight hinges on doors over 3 foot, 5 inches in width.
3. Outswinging exterior doors: non-ferrous with nonremovable (NRP) pins.
4. Non-ferrous material exteriors and at doors subject to corrosive atmospheric conditions.
5. Provide shims and shimming instructions for proper door adjustment.

B. **Pivots**: high-strength forged bronze or stainless steel, tilt-on precision bearings and bearing pin.

1. Bottom and intermediate pivots: adjustability of minus 1/16", plus 1/8".

C. **Floor Closers**: hydraulically controlled, helical compression spring type, adjustable spring power, cast iron cement case, built-in leveling set screws, maximum degree dead stop permitted by trim or adjacent structure. Special pins and longer spindles when indicated.

2.04 LOCKSETS, LATCHSETS, DEADBOLTS:

A. Extra Heavy Duty Cylindrical Locks and Latches:

1. Chassis: cylindrical design, corrosion-resistant plated cold-rolled steel, through-bolted.
2. Locking Spindle: stainless steel, interlocking design.
3. Latch Retractors: forged steel. Balance of inner parts: corrosion-resistant plated steel, or stainless steel.
4. Lever Trim: accessible design, independent operation, spring-cage supported, minimum 2" clearance from lever mid-point to door face.
5. Electric operation: Manufacturer-installed continuous duty solenoid.
6. Strikes: 16 gage curved steel, bronze or brass with 1" deep box construction, lips of sufficient length to clear trim and protect clothing.
7. Lock Series and Design: As scheduled.
8. Certifications:
   a. ANSI A156.2, 1994, Series 4000, Grade 1.
   b. UL listed for A label and lesser class single doors up to 4ft x 8ft.
9. Accepted substitutions: None

B. Standard Duty Cylindrical Locks and Latches:

1. Chassis: cylindrical design, corrosion-resistant plated cold-rolled steel, through-bolted.
2. Locking Spindle: stainless steel, interlocking design.
3. Latch Retractors: forged steel. Balance of inner parts: corrosion-resistant plated steel or stainless steel.
4. Lever Trim: accessible design, independent operation, spring-cage supported, minimum 2" clearance from lever mid-point to face of door.
5. Lock Series and Design: as scheduled.
6. Certifications:
   a. ANSI A156.2, 1994, Series 4000, Grade 2
   b. UL listed for A label and lesser class single doors up to 4ft x 8ft.
7. Accepted substitutions: None

C. Medium Duty Interconnected Locks:

1. Chassis: Interconnected design, corrosion-resistant plated cold-rolled steel, through-bolted.
2. 1” throw deadbolt with hardened steel insert.
3. From the interior, Both the latch and deadbolt are simultaneously retracted, allowing exit.
4. Lever Trim: accessible design, independent operation, spring supported, minimum 2" clearance from lever mid-point to face of door.
2. Lock Series and Design: as scheduled.
6. Certifications:

a. ANSI A156.12, 1992, Series 5000, Grade 2
b. UL listed for A label and lesser class single doors.

7. Accepted substitutions: None

D. Medium Duty Bored Locks:

1. Chassis: cylindrical design, corrosion-resistant plated heat treated steel, through-bolted.
2. Lever Trim: accessible design, independent operation, spring supported, minimum 2" clearance from lever mid-point to face of door.
3. Lock Series and Design: as scheduled.
4. Certifications:
   a. ANSI A156.2, 1989, Series 4000, Grade 2
   b. UL listed for A label and lesser class single doors.
5. Accepted substitutions: None

2.05 EXIT DEVICES/PANIC HARDWARE

A. General features:

1. Independent lab-tested 1,000,000 cycles.
2. Push-through touch pad design. No exposed touch bar fasteners, no exposed cavities when operated. Return stroke fluid dampeners and rubber bottoming dampeners, plus anti-rattle devices.
3. 3/4" throw deadlocking latchbolts.
4. No exposed screws to show through glass doors.
5. Non-handed basic device design with center case interchangeable with all functions, no extra parts required to effect change of function.
6. Releasable with 32lb maximum pressure under 250lb load to the door.
7. Panic hardware shall comply with UBC Standard 10-4 and shall be mounted above 36” to 44” above finish floor surface. The unlatching force shall not exceed 15 lbs. applied in the direction of travel. Panic Hardware shall comply with CBC 1003.1.9.

B. Specific features:

1. Non-Fire Rated Devices: cylinder dogging.
2. Lever Trim: Breakaway type, forged brass or bronze escutcheon min .130" thickness, match lockset lever design.
3. Rod and latch guards with surface vertical rod devices.
4. Fire-Labeled Devices: UL label indicating "Fire Exit Hardware". Vertical rod devices less bottom rod (LBR) unless otherwise scheduled.
5. Electrically Operated Devices: Single manufacturer source for electric latch retraction devices, electrically controlled trim, power transfers, power supplies, monitoring switches and controls.
6. Accepted substitutions: None

2.06 CLOSERS

A. **General**: One manufacturer for closer units throughout the Work, including surface closers, high security closers, overhead concealed closers, floor closers, low-energy door operators and electromagnetic hold-open closers.

B. **Surface Closers**:

1. Full rack-and-pinion type cylinder with removable non-ferrous cover and cast iron body. Double heat treated pinion shaft, single piece forged piston, chrome-silicon steel spring.
2. ISO 2000 certified. Units stamped with date-of-manufacture code.
3. Independent lab-tested 10,000,000 cycles.
4. Thru-bolts at wood doors unless doors are provided with closer blocking. Non-sized and adjustable. Place closers inside building, stairs, and rooms.
5. Plates, brackets and special templating when needed for interface with particular header, door and wall conditions and neighboring hardware.
6. Opening pressure: Exterior doors 8.5 lb., interior doors 5 lb., labeled fire doors 15 lb.
7. Separate adjusting valves for closing speed, latching speed and backcheck, fourth valve for delayed action where scheduled.
8. Extra-duty arms (EDA) at exterior doors scheduled with parallel arm units.
9. Exterior door closers: tested to 100 hours of ASTM B117 salt spray test, furnish data on request.
10. Exterior doors to not require seasonal adjustments in temperatures from 120 degrees F to -30 degrees F, furnish data on request.
11. Non-flaming fluid, will not fuel door or floor covering fires.
12. Accepted substitutions: None

2.07 OTHER HARDWARE

A. **Automatic Flush Bolts**: Low operating force design, "LBR" type.

B. **Overhead Stops**: Stainless steel (300 series). Non-plastic mechanisms and finished metal end caps. Field-changeable hold-open, friction and stop-only functions.

C. **Kick Plates**: Four beveled edges, .050 inches minimum thickness, height and width as scheduled. Sheet-metal screws of bronze or stainless steel to match other hardware.

D. **Door stops**: Provide stops to protect walls, casework or other hardware.

1. Unless otherwise noted in Hardware Sets, provide wall type with appropriate fasteners. Where wall type cannot be used, provide floor type. If neither can be used, provide overhead type, shall not project 4” into P.O.T., refer to

paragraph 3.02(B)

E. **Seals**: Finished to match adjacent frame color. Resilient seal material: solid high-grade neoprene. UL label applied to seals on rated doors. Substitute products: certify that the products equal or exceed specified material's thickness and durability. Proposed substitutions: submit for approval.

1. Solid neoprene: MIL Spec. R6855-CL III, Grade 40.
2. Non-corroding fasteners at inswinging exterior doors.
3. Sound control openings: Use components tested as a system using nationally-accepted standards by independent laboratories. Ensure that the door leafs have the necessary sealed-in-place STC ratings. Adhesive-mounted components not acceptable. Fasten applies seals over bead of sealant.
4. Intumescent seals: UL10C / UBC-7-2 compliant, activates at 250degF to 300degF, multi-directional controlled even expansion, reserve capacity for resealing should door be opened and re-closed.
5. Fire-rated doors: supplied by door manufacturer. Coordinate.

F. **Automatic Door Bottoms**: low operating force units. Doors with automatic door bottoms plus head and jamb seals cannot require more that two pounds operating force to open when closer is disconnected.

G. **Thresholds**: As scheduled and per details. Substitute products: certify that the products equal or exceed specified material's thickness. Proposed substitutions: submit for approval. Accessible thresholds shall comply with CBC Section 1133B.2.4.1.

1. Exteriors: Set in full bed of butyl-rubber or polyisobutylene mastic sealant complying with requirements in Division 7 "Thermal and Moisture Protection". Non-ferrous 1/4inch fasteners and lead expansion shield anchors, or Red-Head #SFS-1420 (or approved equivalent) Flat Head Sleeve Anchors (SS/FHSL).
2. Sound control openings: Set in bed of mastic sealant.

H. **Fasteners**: Generally, exposed screws to be Phillips or Robertson drive. Pinned TORX drive at high security areas. Flat head sleeve anchors (FHSL) may be slotted drive. Sheet metal and wood screws: full-thread. Sleeve nuts: full length to prevent door compression.

I. **Silencers**: Interior hollow metal frames, 3 for single doors, 4 for pairs of doors. Omit where adhesive mounted seal occurs. Leave no unfilled/uncovered prepunched silencer holes.

J. **Electromagnetic Release**: Coordinate location, Voltage, wiring requirements with Fire Alarm System installer. Provide templates for backing locations and size for

wall mounting to contractor for proper location. Provide UL labels and instructions for operation and installation to door installer, door manufacturer.

2.08 FINISH:

A. **Generally BHMA 626 Satin Chrome**.

1. Areas using BHMA 626 to have push-plates, pulls and protection plates of BHMA 630, Satin Stainless Steel, unless otherwise noted.

B. **Door closers**: factory powder coated to match other hardware, unless otherwise noted.

C. **Aluminum items**: match predominant adjacent material. Seals to coordinate with frame color.

2.09 KEYING REQUIREMENTS:

A. **Key System**: Keyway, non-interchangeable core typically with interchangeable core type operating cylinders for exterior doors, doors with panic hardware. Key blanks available only from factory-direct sources, not available from after-market key blank manufacturers. Key should be pre-stamped with “Do Not Duplicate” on one side and the key symbol code (ie;AA1) on the other. All cores should be stamped with a key symbol code on the back. For estimate use factory GMK charge. Initiate and conduct meeting(s) with Owner to determine system structure, furnish Owner's written approval of the system.

1. Construction keying non-interchangeable core: Inserted type partial key. At substantial completion, remove inserts in Owner's presence, demonstrate consequent non-operability of construction key. Give all removed inserts and all construction keys to Owner.
2. Construction keying interchangeable core: Brass keyed-alike temporary cores plus 10 operating keys. Temporary cores and keys remain property of hardware supplier.
3. Recombinate entire project at no extra expense to Owner if missing construction keys.

B. **Key Cylinders**: utility patented, 6-pin solid brass construction.

C. **Locks and cylinders**: keyed at factory of lock manufacturer where permanent records are maintained. Locks and cylinders same manufacturer.

D. **Permanent keys**: secured shipment direct from point of origination to Owner.

E. **Bitting List**: Secured shipment direct from point of origination to Owner upon completion

PART 3 - EXECUTION

3.01 ACCEPTABLE INSTALLERS:

A. **Factory trained and certified**, and carries a factory-issued card certifying that person as a "Certified Installer".

3.02 PREPARATION:

A. **Ensure that walls** and frames are square and plumb before hardware installation.

B. **Locate hardware per SDI-100** and applicable building, fire, life-safety, accessibility, and security codes.

1. Notify Architect of any code conflicts before ordering material.
2. Where new hardware is to be installed near existing doors/hardware scheduled to remain, match locations of existing hardware.

C. **Existing frames and** doors scheduled to receive new hardware: carefully remove existing hardware and turn over to Owner. Patch and fill wood frames and doors with solid wood stock or dowel material before cutting for new hardware. Do not reuse existing screw holes -- fill and re-pilot.

3.03 INSTALLATION:

A. **Install hardware per manufacturer's** instructions and recommendations. Do not install surface-mounted items until finishes have been completed on substrate. Set units level, plumb and true to line and location. Adjust and reinforce attachment substrate for proper installation and operation.

1. Gaskets: install jamb-applied gaskets before closers, overhead stops, rim strikes, etc. Install sweeps across bottoms of doors before astragals, cope sweeps around bottom pivots, trim astragals to tops of sweeps.
2. When hardware is to be attached to existing metal surface and insufficient reinforcement exists, use RivNuts, NutSerts or similar anchoring device for screws.

B. **Locate floor stops** not more than 4 inches from the wall.

C. **Drill pilot holes** for fasteners in wood doors and/or frames.

D. **Lubricate and adjust** existing hardware scheduled to remain. Carefully remove and give to Owner items not scheduled for reuse.

E. **Mounting height of latching** hardware shall be 30” to 44” above finish floor per

CBC Section 1133B.2.5.1.

3.04 ADJUSTING:

A. **Adjust and check for** proper operation and function. Replace units which cannot be adjusted to operate freely and smoothly.

1. Hardware damaged by improper installation or adjustment methods to be repaired or replaced to Owner's satisfaction.

B. **Inspection**: Use hardware supplier. Include supplier's report with close-out documents.

C. **Follow-up inspection**: Installer to provide letter of agreement to Owner that approximately 6 months after substantial completion, installer will visit Project with representatives of the manufacturers of the locking devices and door closers to accomplish following:

1. Re-adjust hardware.
2. Evaluate maintenance procedures and recommend changes or additions, and instruct Owner's personnel.
3. Identify items that have deteriorated or failed.
4. Submit written report identifying problems and likely future problems.

3.05 DEMONSTRATION:

A. **Demonstrate electrical**, electronic and pneumatic hardware systems, including adjustment and maintenance procedures.

3.06 PROTECTION/CLEANING:

A. **Cover installed hardware**, protect from paint, cleaning agents, weathering, carts/barrows, etc. Remove covering materials and clean hardware just prior to substantial completion.

B. **Clean adjacent wall**, frame and door surfaces soiled from installation/reinstallation process.

3.07 SCHEDULE OF FINISH HARDWARE:

A. **See Finish Hardware List** and door schedule in drawings for hardware set assignments.

END OF SECTION

SECTION 08800

GLASS AND GLAZING

PART 1 - GENERAL

1.01 DESCRIPTION: Division 1 applies to this Section. Provide glass and glazing complete as indicated, specified, and required.

A. Related Work Not In This Section:

1. Glass, all types, unless specified elsewhere.

1.02 QUALITY ASSURANCE:

A. Quality Standards: In addition to Code, glass installations shall comply with ANSI Z97.1, as applicable, and Federal Safety Standard 16 CFR 1201.

1.03 SUBMITTALS: Refer to Section 01300 for procedures.

A. Samples and Product Data: Obtain color instructions from the Architect prior to submission. Submit the following:

1. Samples of various glasses to extent requested by Architect, 12" square with smooth edges.
2. Glazing channels with manufacturer's data covering materials and warranty.
3. Samples of insulating glass units as requested.
4. Product data for mirror adhesive.

B. Certificates: Submit from manufacturer stating the quality, thickness, and type of all unlabeled glass and glazing delivered to the site for field cutting.

C. Purchase Orders: Within 35 working days after execution of the Contract, submit evidence to the Architect that firm purchase orders for all glass and glazing required for the Work have been placed with the glass suppliers.

1.04 JOB CONDITIONS: Protect glass and glazing until completion and final acceptance. Repair or replace damaged or defective glazing to the original specified condition, at no extra cost to Owner. Damaged or defective glazing includes glass that cannot be properly cleaned.

1.05 WARRANTY: Refer to Section 01740. Furnish a written warranty covering glass and glazing channels for 5 years against all defective material or deterioration including, without limitation, shrinkage causing loss of seal and exposure to sun, ozone, elements,

smog and other air pollution, and commercial glass cleaners. Furnish insulating glass unit manufacturer's 10 year warranty covering loss of hermetic seal. Furnish a written warranty covering unframed mirrors against silver spoilage for 15 years.

PART 2 - PRODUCTS

2.01 GLASS MATERIALS: Contractor shall coordinate with Architect as to actual glazing selections prior to purchase.

A. **Domestic brand conforming** to ASTM C1036 and ASTM C1048 for tempered, by PPG, Libbey-Owens-Ford, Monsanto, Saint Gobain, Spectrum, Viracon or equal. Factory cut glass lights shall be labeled and labels shall not be removed until directed. Job-cut glass, delivered unlabeled as "stock to cut", shall be accompanied by manufacturer's affidavit stating quality, thickness, type and manufacture; no such glass shall be cut until Architect's approval of material is obtained.

B. **Plate Glass**: Provide glass as scheduled on Drawings. Glazing quality, polished plate or float, 1/4" thick unless otherwise shown.

C. **Tempered Glass**: Furnish factory fully tempered glass. Handle and size glass in accordance with manufacturer's instructions. Furnish glass free of visible tong marks when installed. On each sheet, include an inconspicuous but visible label fused to the glass and placed in a lower corner, identifying the tempered glass. Provide fireman's tempered glass label if required by the local Fire Department. Furnish clear and/or tinted plate glass as indicated on drawings unless otherwise selected by the Architect.

D. **Wire Glass**: Provide glass manufactured by Asahi Glass Company LTD, distributed by ACI Glass Products (213) 692-0395 polished "Misco" or "Baroque Style" 1/4", unless otherwise indicated, thick wire glass, pattern as selected by Architect, or Approved equal.

E. **Fire Rated Glass**: Provide glass manufactured by Technical Glass Products, (800) 426-0279, clear fire rated glass, thickness as indicated on drawings unless otherwise required as selected by Architect, or Approved equal.

F. **Glass Adhesive**: Standard product adhesive expressly manufactured for glass installation, equal to Palmer Products "Mirro-Mastic" with Mirro-Mastic Bond".

2.02 GLASS SETTING MATERIALS:

A. **Glazing Channels**: Extruded neoprene or fibrous glass reinforced core vinyl type conforming to NAAMA SG-1-70, color as approved, with serrated channel legs for a tight seal to glass, meeting 5 year warranty requirements.

B. **Blocks and Spacers**: Approved vinyl plastic or neoprene rubber type, nominal 50 to 90 Durometer except as recommended by glass manufacturer.

C. **Glazing Sealant**: Tremco Mono One-Part Sealant, or equal, approved colors. For butt glazing, use Dow Corning Corp. "Dow Corning Silicone Rubber Sealant" or General Electric Company SCS 1200 Series Silicone Construction Sealant, clear.

PART 3 - EXECUTION

3.01 GLAZING: Employ skilled and experienced glazers. Set glass air-tight and true with glazing channels. Perform glazing according to the "Glazing Manual" of the Flat Glass Jobbers Association and with PPG Technical Service Report #104 except as required herein. Install glass in metal frames according to manufacturer's instructions to obtain weatherproof and waterproof installations. Conform glass edge bearings, clearance, and edge laps to Code. Use glazing channels specified herein unless channels are furnished by manufacturers under other Sections.

A. **Glass Fastenings**: Set glass in rabbets with glazing blocks and spacers so glass does not contact frame. Set glass to preclude looseness and rattling.

B. **Glazing Channels**: Compress channels at least 5% lengthwise during installation, and at least 15% by stops. Produce air and water tight installations.

3.02 COMPLETION: Do not use harsh cleaning agents, caustics, acids, or abrasives for cleaning. Wash and polish glass both sides and leave free of dirt, streaks, and labels.

END OF SECTION

SECTION 09250

GYPSUM WALLBOARD

PART 1 - GENERAL

1.01 DESCRIPTION: Division 1 applies to this Section. Provide gypsum wallboard complete as indicated, specified, and required.

A. Work In This Section: Principal items include:

1. Gypsum wallboard finish on walls and ceilings.
2. Interior tile backer board.
3. Joint, edge, corner, and fastener finishing.
4. Sound insulation in gypsum wallboard partitions.
5. Wall finish to match existing.

B. Related Work Not In This Section:

1. Wood support framing.
2. Thermal and acoustic insulation.
3. Painting.

1.02 SUBMITTALS: Refer to Section 01300 for procedures.

A. Product Data: Submit covering gypsum wallboard installations, including accessories, finishing, sealing, and manufacturer's written installation instructions with copies of Code approvals for each wall, ceiling, and shear wall system.

B. Samples: Submit such Samples as Architect may request.

1.03 JOB CONDITIONS: Make a detailed inspection of areas and surfaces to be enclosed or covered by gypsum wallboard and arrange for correction of defective workmanship or materials. Ascertain that other Work enclosed by gypsum wallboard has been inspected and approved before starting installation; otherwise, uncover as directed at no extra cost to Owner.

PART 2 - PRODUCTS

2.01 MATERIALS:

A. Gypsum Wallboard: ASTM C 1396, provide 5/8" Type X or Type C gypsum board, or any other type of drywall that may be required by fire rated assemblies shown on drawings, tapered edges for exposed surfaces, regular grade by the Code. For all wet wall conditions and where indicated, provide Type W/R or

Type X W/R water resistant boards as required by the jurisdiction and where recommended by the Gypsum Association. Gypsum wallboard manufacturer and type shall match description of fire rated assemblies. Assemblies may be proprietary.

B. **Interior Tile Backer Board**: For walls where indicated on drawings or required, provide Denshield Board or equal at all tile locations. Install per manufacturer's recommendations.

C. **Screws**: ASTM C954 / C1002, corrosion-resistant self-tapping bugle-head spiral-threaded type, minimum 1" long except 1-5/8" for double layer walls, lengths to penetrate all supporting metal at least 3/8". Furnish specially hardened type screws for supports heavier than 25 gage.

D. **Metal Trim, Reveals and Corner Beads**: Of electrogalvanized steel with taping flanges, as manufactured or recommended by drywall manufacturer, corner beads at all outside corners and "J" shaped trim members where abutting other materials. Reveals shall be fabricated by Fry or equal as detailed on drawings.

E. **Finishing Materials**: ASTM C475, joint tape, joint bedding compound, finishing compound, adhesive, and laminating compounds supplied or recommended by wallboard manufacturer.

F. **Calking Compound**: Permanently non-hardening type as supplied or recommended by wallboard manufacturer.

F. **Sound Insulation**: Sound attenuation batts by Owens Corning shall be used in all interior partitions that are not specifically identified with the use of mineral rock wool, “Thermafiber” friction fit fibrous batts, nominal 2.80 pcf density by USG Corp meeting the required 2.80 pcf density as stated above.

G. **Resilient (RC) Furring**: Provide as indicated or required an RC-1 or RC-2 resilient channel per ASTM C645, minimum 25 gage, or “Z” or hat shaped, designed for sound reduction by gypsum wallboard manufacturer as required by acoustical consultant.

PART 3 - EXECUTION

3.01 INSTALLATION OF GYPSUM WALLBOARD:

A. **General**: Perform wallboard installation and finishing according to ASTM C 840 and the gypsum wallboard manufacturer's instructions, outside drywall corners to be lapped to provide solid backing for all metal edges. Do not install wallboard until building is weathertight. Conform to fire-rating requirements, Building Code approvals, and requirements herein.

B. **Temperature**: The temperature within building shall be maintained per ASTM C 840 requirements during the installation and finishing of the gypsum wallboard. Furnish ventilation to eliminate excessive moisture is typically the responsibility of the general contractor.

C. **Fasteners**: Install screws so heads are below wallboard surface without breaking the face paper or stripping metal framing member around the screw. Space screws according to Code approvals or ASTM C 840.

D. **Openings**: Accurately cut and fit the wallboard at openings. At door and other openings, cut wallboard to continue across area above opening head; do not cut gypsum wallboard to both jambs and fill in area over openings with separate pieces. Make the dimension from joint over head of an opening to jamb of openings 6" minimum. Stagger joints on opposite side of partition.

E. **Single Layer Walls**: Place gypsum wallboard horizontally with long dimension across the studs or in one-piece vertical heights, vertical joints centered on supports and staggered on walls so as not to occur on opposite sides of same stud. Secure to each stud and tack with screws keeping screws 3/8" from edges.

F. **Multi-Layer Walls**: Apply first layer same as for single layer walls, all joints in subsequent layers staggered with respect to first layer.

G. **Suspended Ceilings**: Apply gypsum wallboard with long dimension at right angles to the furring channels, end joints staggered and centered over furring channels. Use gypsum wallboards of maximum practical length to minimize end joints and properly support around cutouts and openings. Secure with screws.

H. **Metal Trim and Corner Beads**: Secure all gypsum wallboard metal corners and casing beads with screws 12" on center.

3.02 JOINT TREATMENT AND FINISHING: Apply tape bedding compound, joint tape and the correct numbers of coats of finishing compound on exposed joints, fastener heads and accessories as required for sound insulating, fire-rated construction and for the specific level of gypsum board finish. Provide metal casing beads at all edges of gypsum wallboard which abut ceiling, wall, or column finish, and elsewhere as required, such as openings, offsets, etc. Make all exposed joints, trims, and attachments non-apparent following application of paint or other finishes; if the joints and fasteners are apparent, correct defects as directed with no extra cost to Owner. When entire installations is completed and prior to installation of finish materials by other trades, correct and repair broken, dented, scratched, or otherwise damaged wallboard surfaces.

3.03 SOUND INSULATED PARTITIONS: Install sound insulation continuously between studs from finish floor to top of wall in which it occurs. Where cutouts are made for J-boxes, conduit, piping, and like items, back wall insulation with insulation so that one

additional layer of insulation at least 24" wide and high is placed in back of cutout. Snugly fit in place free of gaps or holes. Calk between the wallboard edges and floors, walls, and at structures above other than acoustical ceilings with calking compound, forming a complete perimeter seal. Calk around outlet boxes and other penetrations in same manner. Coordinate sound insulated areas and materials with Acoustic Consultant.

3.04 WALL FINISH: Where scheduled or required, apply the gypsum board finish that matches the existing interior finish as approved by architect.

END OF SECTION

SECTION 09300

TILE MASONRY

PART 1 - GENERAL

1.01 DESCRIPTION: Division 1 applies to this Section. Provide tile masonry finish complete as indicated, specified, and required.

A. Work In This Section: Principal items include:

1. Ceramic tile walls and bases.
2. Unglazed porcelain tile floors.
3. Expansion joints.
4. Brass, zinc, bronze or aluminum edging angles at exposed floor tile edges.

B. Related Work Not In This Section:

1. Gypsum and cementitious wallboard backing for tile walls and bases.
2. Concrete subslabs.
3. Membrane waterproofing.
4. Metal thresholds.

1.02 QUALITY ASSURANCE:

A. Reference Standards: Conform to following standards unless otherwise required herein:

1. American National Standards Institute (ANSI).
   - A108.1 Glazed Wall Tile, Ceramic Mosaic Tile, Quarry Tile and Paver Tile Installed With Portland Cement Mortar.
   - A108.5 Ceramic Tile Installed With Dry-Set Portland Cement Mortar.
   - A108.6 Ceramic Tile Installed With Chemical Resistant Water Cleanable Tile-Setting and Grouting Epoxy.
   - A118.1 Dry-Set Portland Cement Mortar.
   - A118.3 Chemical-Resistant Water-Cleanable Tile Setting and Grout Epoxy.
   - A118.4 Latex-Portland Cement Mortar.
2. Tile Council of America (TCA).
   a) Handbook for Ceramic Tile Installation, Current Edition.
   b) Standard Specifications for Ceramic Tile.

1.03 SUBMITTALS: Refer to Division 1 for requirements and procedures.

A. Samples: Obtain Architect's instructions and submit the following for selection and approval:

1. Each type, shape, and trimmer of tile in each color proposed for use.
2. Grout colors for tile.
3. Cured sealant colors for expansion joints in tile.
4. Brass, zinc, bronze or aluminum edging angles, 12" lengths.

B. **Product Data**: Submit the manufacturer's printed directions for latex mortar and latex waterproofing.

C. **Master Grade Certificates**: Submit for each lot of tile before installing.

1.04 PRODUCT DELIVERY AND STORAGE: Deliver all tile to the site in unopened factory containers sealed with Grade Seal bearing printed name of manufacturer and the words "Standard Grade". Keep grade seals intact and containers dry until tiles are used. Keep cementitious materials dry until used.

1.05 JOB CONDITIONS

A. **Conditions**: Inspect and verify surfaces according to Division 1 for requirements and procedures and report defects to Architect for correction before proceeding.

B. **Protection**: Provide protection wherever required. Do not use lumber or other material likely to stain or deface installed materials. Close tile flooring to traffic completely for 24 hours after installation; thereafter, permit traffic only over protective covering of heavy paper or equivalent.

PART 2 - PRODUCTS

2.01 BASIC MATERIALS: Dal-Tile or approved equal.

Portland cement:	ASTM C150. Type I or II, low alkali.
Dry-set portland cement mortar:	ANSI A118.1, white or gray as specified.
Hydrated lime:	ASTM C207, Type S.
Mortar sand:	ASTM C144, at least 4% passing No. 100 sieve.
Joint sand:	Same as mortar sand except as passing No. 30 sieve.
Water:	From domestic potable source.
Admix:	Anti-Hydro, Sika Red Label Suconem, or equal.
Reinforcing mesh:	Galvanized welded wire mesh, 1-1/2" by 2" mesh or 2" square mesh, minimum 16 gage, or equivalent or equal steel cross-section area.
Metal lath:	Expanded from galvanized steel sheets, 3.4 pounds per square yard, self furring type, galvanized nails, or as specified for reinforcing mesh.
Latex mortar:	ANSI A118.4 (factory inclusion of aggregate is not required), one of the following, or equal: Mer-Krete Tile Setting Adhesive. Custom-Crete Custom Building Products.

	Laticrete by Laticrete International.
Latex admix:	For joint grout, by same manufacturer as above latex mortar.
Epoxy, tile setting mortar and grout:	ANSI A118.3, as indicated on drawings and color as selected by Architect.
Waterproofing membrane:	The Noble Company, Chloroloy 240-CPE for wire reinforced mortar beds. Nobleseal TS for thin set tile applications, or approved equal.
Color pigments:	Pure ground mineral oxides, non-fading, alkali and lime proof, factory weighed and packaged.
Tile backer board:	Provide GP Denshield backer boards, thickness as indicated for interior and exterior applications as approved by the Architect.

2.02 TILE MATERIALS: Standard Grade conforming to ANSI A137.1, of following types. Perforated paper backed tile is not acceptable where the paper remains as a permanent part of installation.

A. **Ceramic Wall Tile**: Tile as scheduled on drawings, colors as selected, dust pressed, white body, square edged, with two integral joint spacing lugs on all edges, matte glazed, with matching integral cove base having spherical corner and angle units, integral bullnose for external angles and exposed edges, and integral cove for internal angles.

B. **Non-Slip Unglazed Floor Tile**: Tile as scheduled on drawings colors and patterns as selected, porcelain type unglazed tile, cushion or all-purpose edges, premium colors and patterns, square unless otherwise shown. The unglazed floor tile, shall contain at least 7-1/2% of non-rusting abrasive aggregate. Provide for all flooring.

2.03 BOND COAT: White or gray portland cement mixed with water and latex admix to a creamy consistency. For glazed wall tile only, gray or white dry-set portland cement mortar mixed in the same manner may be used. Do not add water or cement after initial mixing, and discard material not used prior to initial set.

2.04 TILE JOINT GROUT: Refer to drawings for schedule of grout and colors. Waterproofed portland cement, white for walls and gray for floor, latex admix, and color pigment to produce cured dry color matching the approved Samples. Include silica sand passing the No. 20 sieve for joints over 1/8" wide, not over twice the volume of portland cement.

2.05 EDGING ANGLES: Extruded aluminum as indicated or required of minimum 1/8" leg thickness, as approved.

PART 3 - EXECUTION

3.01 PREPARATION: Clean substrates of dust, dirt, oil, grease, and other deleterious substances. Conform preparation to requirements of the applicable Reference Standards and to recommendations of manufacturers of materials used.

A. **Gypsum Wallboard or Denshield Board**: Prime with epoxy or latex primer as required or admix if required by instructions of epoxy or latex mortar manufacturer.

3.02 TILE INSTALLATION: Arrange tile surfaces according to the patterns detailed or approved. Accurately set tile with flush well-fitted joints, finished in true plan, plumb, square, sloped or level as required. Neatly cut and fit the tile closely against abutting surfaces. Construct joints of uniform width. Form corners and returns with approved trimmers. Neatly drill and cut tile without marring. Carefully grind and joint tile edges and cuts. Fit tile close around outlets, pipes, and fixtures so that escutcheons or collars overlap the tile. Arrange surfaces so that not less than half-size tile occurs. Drill holes for pipe penetrations through wall tile, do not cut or split tile, and set with tight ungrouted joint.

A. **Thin-Set Tile**: Mix epoxy or latex mortar according to manufacturer's directions. Do not dampen tile. Conform to the instructions of both mortar and tile manufacturers. Apply mortar to areas no larger than can be covered with tile within 30 minutes. Remove traces of mortar from tile surfaces before final set.

B. **Latex Waterproofing**: Apply according to manufacturer's directions, sealed into floor drains and turned up at walls. Pond test for 24 hours, repair all leaks, and retest until no leakage occurs.

C. **Joint Sizes**: Install tile with uniform joint widths as follows:

1. Glazed and special accent wall tile, 1/16" with maximum 1/8" at any location, unless otherwise indicated.
2. Porcelain floor tile, 1/16" with maximum 1/8" at drains and any other location, unless otherwise indicated.

D. **Caulking**: Caulk all penetrations through wall tile with latex mortar or sealant conforming to Section 07900, concealed by collars or escutcheons.

3.03 EXPANSION JOINTS: Joints shall extend down for the full depth of mortar setting bed. Provide joint backing and sealant according to Section 07900, sealant of color to match joint grout and maximum 3/8" depth. Provide expansion joints in mortar set floor tile and paving areas where indicated and where abutting rigid structures. Install at toe of cove base where base occurs. If not indicated, install expansion joints in the same manner and at maximum 16-foot intervals in runs, located as directed. Provide sealant joints that closely match the color and appearance of grouted joints but of minimum 1/8” width. Provide as required by installation and as recommended by the Tile Council of America. Joints to comply with Method EJ171. Consult Architect as to placement.

3.04 CLEANING: Remove stains, cement, grout, and foreign matter when grouted joints fully set. Do not use acid. Repair all defective joints as approved.

END OF SECTION

SECTION 09650

RESILIENT FLOORING

PART 1 - GENERAL

1.01 DESCRIPTION: Division 1 applies to this Section. Provide resilient flooring and base complete as indicated, specified, and required.

A. Work In This Section: Principal items include:

1. Vinyl composition tile flooring.
2. Vinyl base.
3. Reducer strips.

B. Related Work Not In This Section:

1. Raised metal thresholds.

1.02 QUALITY ASSURANCE: Furnish products by the following manufacturers, or approved equals:

Resilient Flooring	**Vinyl / Rubber Base**
Armstrong World Industries	Burke Rubber Company
Mannington	Johnsonite
Azrock	Roppe Rubber Corporation

A. Qualifications of Installing Mechanics: Employ skilled resilient flooring mechanics.

B. Requirements of Regulatory Agencies: Resilient flooring shall meet the requirements of Federal, State and Local Regulatory Agencies for flammability, and other properties as required and as specified herein.

1.03 SUBMITTALS: Refer to Section 01300 for submittal procedures.

A. Samples: Submit the following for selection and approval:

1. Chip Samples showing the full range of flooring and base colors and patterns for preliminary selection.
2. After preliminary selection, submit full-size Samples of each selected color or pattern of flooring and base for final approval.
3. Reducer strips and trims.

B. Data: Submit copies of the flooring manufacturer's recommended standard dryness testing, ADA compliance, and required test results, and installation instruction for each type of flooring and base for approval.

C. **Moisture Testing Results**: Submit written reports covering all moisture test results for record purposes only and not for approval.

D. **Maintenance Materials**: At completion, deliver following maintenance materials to the Owner in unopened factory containers or in sealed cartons with labels identifying the contents, matching installed materials. Include unopened cans of adhesives adequate to install the maintenance materials.

1. Vinyl composition tiles, 1 unopened boxes of each color and pattern of tile.
2. Vinyl / Rubber base, at least 100 lineal feet with 10 end stop units, 15 outside corner units, and 15 inside corner units.

1.04 PRODUCT DELIVERY AND STORAGE: Deliver materials to site in the manufacturer's original unopened labeled containers. Store all resilient flooring at minimum 70 degrees F for 48 hours before installing.

1.05 JOB CONDITIONS: Do not start flooring installation until satisfactory moisture testing results are obtained and the Work of all other trades is substantially completed, including painting. Keep the areas of installation and materials at minimum 70 degrees F during and for 10 days after installation is completed. Maintain adequate ventilation for the removal of moisture and fumes. Verify conditions as specified in Section 01400.

PART 2 - PRODUCTS

2.01 MATERIALS:

Vinyl composition tile:	Quality equal to or exceeding Fed Spec SS-T-312, Type IV, 12" by 12" by minimum 1/8", provide Armstrong World Industries “Imperial” tile as scheduled on drawings or tile as selected by District.
Vinyl / Rubber base:	Straight and coved top-set 4" high as indicated on drawings using colors as scheduled on drawings or as selected by Architect, non-shrinking, 1/8" thick, with matching molded inside and outside corners and end stops.
Setting materials:	No VOC Adhesives, primers, and fillers of type and composition recommended by materials manufacturers, cut-back or equal types not containing water, factory labeled as to substrates on which application is approved by the manufacturer.
Reducer strips:	Extruded brass, bronze or aluminum as selected by the Architect, edge-butting (not lapping) type.

PART 3 - EXECUTION

3.01 INSTALLATION: Conform to flooring manufacturer's recommended moisture testing and installation procedures and to requirements herein.

A. **Cleaning and Drying**: Clean slabs of oil, grease, waxes, curing compound, dust, dirt, debris, paint, and other deleterious substances. Verify that concrete is dry and vapor emission levels should not exceed three pounds as determined by the proper application of the calcium chloride test, if higher than 3 pounds, STOP INSTALLATION, number of tests as needed to ensure that slabs are dry but at least one test per floor and for every 2500 square feet of floor area. Allow slabs showing excessive moisture to dry and re-test until dried to tolerance allowed by floor adhesive manufacturer. Use a commercial vacuum cleaner to remove dust and dirt. Damp mop to remove dust that may remain after first vacuuming, allow surface to dry, and again vacuum; repeat the procedure if necessary to eliminate all dust. Do not use oiled or chemical treated sawdust or any similar product for dust removal.

B. **Leveling**: All floor slabs shall be true to level and plane within a tolerance of 1/8" in 10-feet. Test floor areas both ways with a 10-foot straightedge and repair high and low areas exceeding allowable tolerance. Remove high areas by power sanding, stone rubbing or grinding, chipping off and filling with leveling compound, or equivalent method. Fill low areas with leveling compound. Repair and level the surfaces having abrupt changes in plane, such as trowel marks or ridges, whether or not within the allowable tolerance. Again clean areas where repairs are performed.

C. **Vinyl Composition Tile Installation**: Mix sufficient quantity of tiles to complete each area before laying to avoid color variations. Install flooring with tight joints, pattern direction as approved. Lay flooring square with axis of rooms, starting on center lines with tile joint or tile center so that border tiles are not less than 4" wide, accurately aligned. Install reducer strips at exposed edges of flooring and where shown. Cut flooring mechanically to produce square true edges. Closely trim to pipes, jambs, outlets, and like conditions. Extend flooring under all cabinets and casework.

D. **Base Installation**: Securely cement to backing in long lengths, minimum 18" long filler pieces, top and toe continuously contacting wall and floor, all joints tight. Provide factory-made internal and external corners, and end stops where cove base ends at jambs and offsets.

3.02 CLEANING AND COMPLETION: Keep all flooring and base surfaces clean as installation progresses. Clean flooring and base when sufficiently seated and remove foreign substances. Immediately prior to Owner's acceptance of building clean resilient tile flooring and base in accordance with manufacturer's instructions. Clean adjacent surfaces of adhesive or other defacement. Replace all damaged or defective Work to the original specified condition.

END OF SECTION

SECTION 09900

PAINTING

PART 1 - GENERAL

1.01 DESCRIPTION: Division 1 applies to this Section. Provide and perform painting, complete.

A. Work In This Section: Principal items include:

1. Submittals.
2. Preparation of surfaces.
3. Painting of interior surfaces, except as otherwise specified.
4. Painting of exterior surfaces, except as otherwise specified.
5. Back priming of all wood trim.

B. Related Work Not In This Section:

1. Shop prime coats and factory finishes.
2. Painting specified as Work of other Sections.
3. Calking and sealants.

C. Surfaces Not To Be Painted:

1. Non-ferrous metal work (other than zinc-coated surfaces) and plated metal, unless particular items are specified to be painted.
2. Tile masonry.
3. Surfaces concealed in walls and above solid ceilings.
4. Non-metallic walking surfaces unless specifically shown or specified to be painted.
5. Factory finished surfaces.
6. Ceramic tile and plastic surfaces.
7. Resilient flooring and base.
8. Surfaces indicated not to be painted.
9. Surfaces specified to be finish painted under other Sections.

1.02 SUBMITTALS: Refer to Section 01300 for procedures.

A. List of Paint Materials: Prior to submittal of Samples, submit a complete list of proposed paint materials, identifying each material by manufacturer's name, product name and number, including primers, thinners, and coloring agents, together with manufacturers' catalog data fully describing each material as to contents, recommended usage, and preparation and application methods and all manufacturers warranties. Identify surfaces to receive various paint materials. Do not deviate from approved list.

B. **Color Samples**: Prior to preparing Samples, obtain Owner's color and gloss selections and instructions. Using materials from approved list, prepare and submit 8-1/2" by 11" Samples of each complete opaque paint finish.

C. **Natural or Stain Finish Samples**: Prepare Samples on 12" squares of the same species and appearance of wood as used in the Work.

1.03 JOB CONDITIONS:

A. **Protection**: Protect all painting while in progress and cover and protect adjoining surfaces and property of others from damage. Exercise care to prevent paint from contacting surfaces not to be painted. During painting of exterior work, cover windows, doors, concrete, and other surfaces not to be painted.

B. **Examination of Surfaces**: Examine surfaces to be painted or finished under this Section and verify satisfactory condition; as specified in Section 01400, notify General Contractor and/or Owner and/or Architect in writing of unsatisfactory surfaces. Application of first coat of any finishing system constitutes acceptance of the surface by Painting Subcontractor. This does not relieve the Sub-Contractor from proper preparation of surfaces.

C. **Weather Conditions**: Apply paint to clean, dry, prepared surfaces. Do not apply exterior paint during rainy, damp, foggy, or excessively hot and/or windy weather. Arrange for temporary heat and ventilation required for interior painting.

D. **Precaution**: Place oily rags and waste in self-closing metal containers, removed from site at the end of each day. Do not let rags and waste accumulate.

1.04 WARRANTY: Refer to Section 01740. Furnish a written warranty against defects in labor for 1 year and 5 years for materials covering all loss of deterioration, color changes and other defects.

PART 2 - PRODUCTS

2.01 MATERIALS: Use the paint products of only one paint manufacturer unless otherwise specified or approved. In any case, primers, intermediate, and finish coats in each painting system must be products of same manufacturer, including thinners and coloring agents, except materials furnished with prime coat by other trades. To the maximum extent feasible, factory mix each paint material to correct color, gloss, and consistency for application. Dunn-Edwards Paint Company (No-VOC or Low VOC)) products specified designate intended types and qualities. Furnish paints from one of the following manufacturers; refer to Section 01600 regarding substitutions:

Dunn Edwards Kelly Moore

PART 3 - EXECUTION

3.01 WORKMANSHIP: Apply painting materials in accordance with manufacturer's instructions by brush or roller; spray painting is not allowed without specific approval in each case. Apply each coat at the proper consistency, free of brush or roller marks, sags, runs, or other evidence of poor workmanship. Do not lap paint on glass, hardware, and other surfaces not to be painted; apply masking as required. Sand between enamel coats.

3.02 PREPARATION: Properly prepare surfaces to receive finishes.

A. **Concrete**: Fill cracks, holes, and other blemishes with portland cement patching plaster or a stiff paste mixed of finish paint and fine sand, finished to match adjoining surface. Remove glaze by sanding, wire brushing, or light brush-off sandblasting. Neutralize alkali conditions according to paint manufacturer's directions. Dry the surfaces to receive breathing type latex paints at least two weeks, free of visible moisture. Dry the surfaces to receive oil, alkyd, or epoxy based paint until moisture content does not exceed 8% when tested with an electronic moisture-measuring instrument.

B. **Exterior Plaster**: Fill hairline cracks with portland cement patching material; report larger cracks to Architect for correction. Test and ensure plaster is sufficiently dry to receive the paint finish.

C. **Gypsum Wallboard**: Touch-up minor defects with spackle, sanded smooth and flush. Report other defects as specified.

D. **Shop Coated Metal**: Degrease and clean of foreign matter. Clean and spot paint field connections, welds, soldered joints, burned, or abraded portions with same material used in shop coats. After complete hardening, sand entire surfaces for coat to follow.

E. **Uncoated Ferrous Metal**: Degrease and clean of dirt, rust, mill scale, and other foreign matter using rotary brushes, solvent, or sandblasting. Remove pits and welding slag, and clean surfaces to bright metal before priming. Apply metal primer not more than three hours after preparation.

F. **Galvanized and Non Ferrous Metal**: Degrease and clean of foreign matter. Apply specified pretreatment, and immediately apply primer paint.

G. **Enameled Woodwork**: Sand smooth with grain and dust clean. After priming, putty all nail holes, cracks, or other defects with putty matching color of finish paint. Cover knots and sappy areas with shellac or approved knot sealer. Sand each base coat smooth when dry. Back prime exposed exterior wood or wood type products.

H. **Fixtures, Equipment, and Hardware Items**: Cooperate with other trades and coordinate removal of fixtures, equipment, and hardware as required to perform painting. Items to be removed include, without limitation: signs and graphics; switch and receptacle plates; escutcheons and like plates; all surface-mounted equipment; free-standing equipment blocking access; grilles and louvers at ducts opening into finished spaces; and other items as required and directed.

I. **Reveals**: In gypsum board, plaster and other surfaces reveals are to be painted to match adjacent color and finish, unless otherwise indicated or selected by the Owner. Obtain approval of the Architect prior to commencing work.

J. **Back Priming**: Refer to Section 06200 for requirements. Unexposed backside of all exterior siding, wood trim or other wood products shall be back primed and/or finished per manufacturer's recommendations.

K. **Surfaces Not Mentioned**: Prepare surfaces according to recommendations of the paint manufacturer's and as approved.

3.03 COATS AND COLORS: The number of paint coats specified to be applied are minimum. Ensure acceptable paint finishes or uniform color, free from cloudy or mottled areas and evident thinness on arises. "Spot" or undercoat surfaces as necessary to produce such results. Tint each coat a slightly different shade of finish color to permit identification. Conform to approved Samples. Obtain approval of each coat before applying next coat; otherwise apply an additional coat over entire surface involved at no additional cost to Owner.

3.04 EXTERIOR PAINTING:

A. **Concrete & Plaster**:

1st Coat:	W6315 Flex-Prime
or	ESPR00 Eff-Stop Premium
2nd Coat:	SSHL10 Spartashield Acrylic Flat Paint
3nd Coat:	SSHL10 Spartashield Acrylic Flat Paint

B. **Metal - Ferrous**:

1st Coat:	BRPR00 Bloc-Rust Premium
2nd Coat:	EVSH50 Evershield Semi-Gloss
3rd Coat:	EVSH50 Evershield Semi-Gloss

Exception: On exposed surfaces of steel stairs and steel pipe or steel tubing railings, metal doors and frames apply 2 coats of W9 Syn-Lustro Semi-Gloss or W10 Syn-Lustro Gloss in lieu of the 2nd and 3rd Coats above.

C. **Metal - Galvanized**: Treat with GE 123 Galva-Etch Etching Liquid before priming.

1st Coat:	GAPR00 Galv-Alum Premium
2nd Coat:	EVSH50 Evershield Semi-Gloss
3rd Coat:	EVSH50 Evershield Semi-Gloss

Exception: On roof and wall flashings, wall louvers, and other sheet metal flashing visible on building exterior, apply two coats of W 704 Acri-Flat in lieu of the 3rd Coat above.

3.05 INTERIOR PAINTING: Provide finishes as scheduled on Drawings or directed, gloss of finishes as scheduled or, where not scheduled, as designated by the Architect. Enamel for finish shall be of the following glosses:

Gloss Enamel	-	W7600V Spartagloss Gloss Enamel
Semi-Gloss Enamel	-	ENSO50 Enso Semi-Gloss (Zero VOC) Enamel
	Or	SPMA50 Suprema Semi-Gloss Enamel
Eggshell Enamel		ENSO30 Enso Egg-Shell (Zero VOC) Enamel
	Or	SPMA30 Suprema Egg-Shell Enamel

A. Flat - Drywall:

1st Coat:		VNPR00 Vinylastic Premium Sealer
2nd Coat:		ENSO10 Enso Flat (Zero VOC)
	Or	W420V Walltone Flat paint

B. Enamel - Drywall:

1st Coat:		IKPR00 Inter-Kote Premium
2nd Coat:		ENSO50 Enso Semi-Gloss (Zero VOC) Enamel
	Or	SPMA50 Suprema Semi-Gloss Enamel
3rd Coat:		ENSO50 Enso Semi-Gloss (Zero VOC) Enamel
	Or	SPMA50 Suprema Semi-Gloss Enamel

C. Enamel - Wood:

1st Coat:		IKPR00 Inter-Kote Premium
2nd Coat:		ENSO50 Enso Semi-Gloss (Zero VOC) Enamel
	Or	SPMA50 Suprema Semi-Gloss Enamel

D. Flat - Metal: Treat galvanized metal with Krud Kutter, Clean and Etch.

1st Coat:		UGPR00 Ultra-Grip (for galvanized metal)
	Or	BRPR00-1-WH Bloc-Rust White (for ferrous metal)
	Or	BRPR00-1-RO Bloc-Rust Red Oxide (for ferrous metal)
2nd Coat:		SPMA10 Suprema Flat

3rd Coat: SPMA10 Suprema Flat

E. Enamel - Metal: Treat galvanized metal with Krud Kutter, Clean and Etch.

1st Coat: UGPR00 Ultra-Grip (for galvanized metal)
Or BRPR00-1-WH Bloc-Rust White (for ferrous metal)
Or BRPR00-1-RO Bloc-Rust Red Oxide (for ferrous metal)
2nd Coat: Enamel, gloss as scheduled or designated
3rd Coat: Enamel, gloss as scheduled or designated

Exception: On exposed surfaces of steel stairs and steel pipe or steel tubing railings, metal doors and frames apply 2 coats of W9 Syn-Lustro Semi-Gloss or W10 Syn-Lustro Gloss in lieu of the 2nd and 3rd Coats above.

3.06 MISCELLANEOUS PAINTING:

A. Duct Interiors: Paint with flat black fire-retardant paint to extent visible through grilles and registers in finished rooms and spaces.

B. Weatherstripping or Sound Seals: Paint exposed metal surfaces to match the door frame, whether or not unfinished, furnished with factory prime coat, or factory treated for paint adhesion.

C. Mechanical and Electrical Work: Carefully review Divisions 15 and 16 of the Specifications regarding painting performed thereunder and other painting required to be performed under this Section. Perform all painting of mechanical and electrical equipment and materials that are not expressly specified to be painted under Division 15 or 16, including required identification and color code painting, stenciling, and banding.

D. Miscellaneous: For any items not specifically shown or specified that require a paint finish, Contractor shall confer with Owner to determine if any additional painting is required, apply 3 coats of paint as directed.

3.07 CLEANING AND TOUCH-UP WORK: Make a detailed inspection of paint finishes after all painting is completed, remove spatterings of paint from adjoining surfaces, and make good all damage that may be caused by such cleaning operations. Carefully touch-up all abraded, stained, or otherwise disfigured painting, as approved, and leave entire painting in first-class condition.

END OF SECTION

SECTION 10010

BUILDING SPECIALTIES

PART 1 - GENERAL

1.01 DESCRIPTION: Division 1 applies to this Section. Provide building specialties complete as indicated, specified, and required.

A. Work In This Section: Principal items include:

1. Fire extinguisher cabinets.
2. Signs.

B. Related Work Not In This Section:

1. Metal fabrications.
2. Finish carpentry.
3. Painting.

1.02 SUBMITTALS: Refer to Division 1 for procedures.

A. Shop Drawings and Samples: Submit for various items as specified hereinafter. Shop materials, finish, characteristics, construction and fabrication details and procedure, layout and erection diagrams, methods of anchorage to building construction, templates for backing or anchorage, and other criteria.

B. Product Data: Submit catalog data for the standard manufactured items and as applicable to shop-fabricated or shop-assembled items.

PART 2 - PRODUCTS

2.01 MANUFACTURE: Use products of only one manufacture throughout for each specialty item specified unless otherwise noted or approved.

2.02 FIRE EXTINGUISHER CABINETS: Provide where shown, cabinets manufacture by JL Industries, Inc., Provide Cosmic Series, Model 5E, 5 lb. cap., 2A:10B:C UL rating. Color Red, Provide cabinets of Academy Series, Finish to be painted aluminum, color as selected by Architect, with square trim where surface mounted, rolled edge for semi-recessed installation, and return trim for full recessed installation. Provide door style B, solid door with # 17 clear tempered safety glass insert and SAF-T-LOK. Provide lockable fire extinguisher cabinets. Provide Fire-FX option at fire-rated walls. Mounting Brackets are Mark Bracket model MB818, marine type bracket.

2.03 SIGNS: Fabricate and provide signs as detailed on drawings or as selected by Architect. Provide Shop Drawings for Architects approval prior to fabrication. Contracted Grade 2 Braille shall be used whenever Braille symbols are specifically required. Dots shall be

spaced 1/10" on center within each cell with 2/10" space between cells. Dots shall be raised 1/40" above background. Refer to CBC Section 1117B.5.6. All signage shall conform to CBC Section 1117B.5 and 1103.2.4.

PART 3 - EXECUTION

3.01 INSTALLATION: Conform to the approved submittals and the various manufacturers instructions.

END OF SECTION

SECTION 10163

TOILET PARTITIONS

PART 1 - GENERAL

1.01 DESCRIPTION: Division 1 applies to this Section. Provide solid phenolic toilet partitions as indicated, specified, and required.

A. Work In This Section: Principal items include:

1. Floor mounted toilet partitions.
2. Wall-mounted urinal screens.

B. Related Work Not In This Section:

1. Toilet accessories.
2. Concealed backing or blocking in walls.

1.02 SUBMITTALS: Refer to Section 01300 for procedures.

A. Shop Drawings: Submit Shop Drawings showing dimensioned layouts, the required location of backing in walls, connections to ceiling and wall supports, preparation and reinforcing of panels to receive various toilet accessories and grab bars, and erection diagrams.

B. Product Data: Submit catalog data for each hardware item and fitting.

C. Samples: Submit Samples of finish in designated colors as scheduled on drawings or as selected by Architect for approval prior to fabrication.

D. Certificate: Submit manufacturer's certificate attesting that, treatment, and finish provided conform to requirements specified and ADA requirements.

PART 2 - PRODUCTS

2.01 TOILET COMPARTMENTS: Bobrick Floor Mounted Overhead Braced “DuraLine” Series 1080 solid phenolic compartments, with polished black edges color(s) as scheduled on drawings or as selected by the Architect

A. Construction: As standard with manufacturer, modified as necessary to suit the installation requirements, 1" finished thickness for doors, stiles, wall posts, and panels, with no hardware exposed on exterior compartments. Provide reinforced cutouts in partitions where required for toilet accessories. Provide concealed reinforcements for grab bar connections to panels, designed for at least 300 pound shear load. Provide a anodized aluminum continuous anti-grip profile channel to cap over top of pilasters.

B. **Hardware**: Provide hardware as selected by the Architect with the compartment manufacturer. Equip doors with continuous hinges, coat hook and bumper, latch bolt, and combination stop and keeper. Assemble compartments with continuous wall metal brackets matching hardware. Use theft-proof fasteners of matching materials. Provide U-shaped or loop type hardware at each side of door, and flip-over or sliding latch per 2019 CBC 11B-604.8.1.2. .for accessible stalls. Toilet stalls for disabled persons shall have slide bolt door latch, wire pulls both sides of the door and self closing hinges. Door hardware shall be mounted at 30” to 44” above finished floor. Disabled doors at front entry stalls shall have 32”, and side entry stalls shall have 34” minimum clear width when the door is open 90 degrees. Coat hook shall be installed at 48” maximum.

C. **Urinal Screens**: Same construction, thickness, and finish as partitions, 18" by 42" size unless otherwise indicated, installed with continuous metal brackets secured with matching machine screws into concealed backing.

PART 3 - EXECUTION

3.01 INSTALLATION: Form and assemble work plumb, square, and in true plane without warp or wind, connections made tight and secure. Remove punctured or scratched material and provide conforming material. Leave the entire installation clean and free of oil, grease, handmarks, or other foreign matter, and with hardware adjusted for correct operation.

END OF SECTION

SECTION 10350

FLAGPOLES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. **Drawings and general provisions** of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. **This Section includes the following**:

1. Aluminum flagpoles.

B. **Related Sections include the following**:

1. Division 3 Section "Cast-in-Place Concrete" for concrete footings for flagpoles, if any, and if not specified in this Section.
2. Division 7 Section "Sheet Metal Flashing and Trim" for flashing at roof-mounted flagpoles.
3. Division 7 Section "Joint Sealants" for elastomeric sealant filling the top of the foundation tube, if any.

1.03 PERFORMANCE REQUIREMENTS

A. **Structural Performance**: Provide flagpoles capable of withstanding the effects of wind loads as determined according to the building code in effect for this Project or NAAMM FP1001, "Guide Specifications for Design Loads of Metal Flagpoles," whichever is more stringent.

1. Base flagpole design on maximum standard-size flag suitable for use with pole or flag size indicated, whichever is more stringent.
2. Basic Wind Speed: For Project location, 90 mph.

1.04 SUBMITTALS

A. **Product Data**: For each type of flagpole required. Include installation instructions.

B. **Shop Drawings**: Show general layout, jointing, grounding method, and anchoring and supporting systems.

1. Include details of foundation system for ground-set poles.

C. **Structural Calculations**: For flagpoles indicated to comply with certain design loadings, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

D. **Finish Samples for Verification**: For each finished metal used for flagpoles and accessories.

1.05 QUALITY ASSURANCE

A. **Source Limitations**: Obtain each flagpole as a complete unit from a single manufacturer, including fittings, accessories, bases, and anchorage devices.

1.06 DELIVERY, STORAGE, AND HANDLING

A. **General**: Spiral wrap flagpoles with heavy kraft paper or other weathertight wrapping and enclose in a hard fiber tube or other protective container.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

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

1. LPH. bolander & Sons; (800-434-5611).
2. American Flagpole. (213-945-8951).
3. Concord Industries, Inc. (800-527-3902).
4. Morgan-Francis (800-814-9568).
5. Substitutions: Refer to Section 01600 regarding substitutions.

2.02 FLAGPOLES AND COMPONENTS

A. **Pole Construction, General:** Construct poles and ship to Project site in one piece, if possible. If more than one piece is necessary, provide snug-fitting precision joints with self-aligning, internal splicing sleeve arrangement for weathertight, hairline field joints.

B. **Aluminum Flagpoles:** Fabricate from seamless, extruded tubing complying with ASTM B 241 alloy 6063, with a minimum wall thickness of 3/16 inch. Heat treat after fabrication to comply with ASTM B 597, temper T6.

1. Provide cone-tapered aluminum flagpoles.

C. **Foundation Tube Sleeve:** Corrugated 16 gage steel, galvanized, depth of 36 inches, with 3/8 inch steel base plate, whose square dimensions is two inches larger than sleeve diameter.

D. **Baseplate:** Cast-metal shoe base for anchor-bolt mounting, of same metal and finish as flagpole. Provide with anchor bolts.

1. Provide ground spike at pavement-mounted metal flagpoles.
2. Provide connector for lightning protection system conductor at roof-mounted metal flagpoles.

E. **Outside Butt Diameter:** 5 inches.

F. **Outside Tip Diameter:** 3 inches.

G. **Nominal Wall Thickness:** 0.125 inch.

H. **Nominal Height:** 30 ft, measured from nominal ground elevation.

I. **Halyard:** External type.

2.03 ACCESSORIES

A. **Finial Ball**: 14 gauge aluminum, 6 inch diameter.

B. **Truck Assembly**: Cast aluminum body, cast Delrin Sheave on stainless steel pin, internal, stationary, non-fouling.

C. **Cam Cleat**: No maintenance, self locking, non-corrosive materials, mounted inside pole. Locking access door with keyed cylinder lock.

D. **Halyard**: 5/16 inch diameter polypropylene, braided, white, with 1/16 inch diameter galvanized steel core, of length for pole height.

1. Stainless quick link, vinyl coated weight, beaded sling with vinyl covered bronze swivel snap.

E. **Flash Collar**: Spun aluminum alloy 5052-H32, of diameter and shape as detailed.

F. **Lighting Ground Rod**: 18 inch long copper rod, 3/4 inch diameter.

2.04 MISCELLANEOUS MATERIALS

A. **Concrete**: Comply with requirements of Division 3 Section "Cast-in-Place Concrete."

B. **Nonshrink, Nonmetallic Grout**: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107.

C. **Sand**: ASTM C 33, fine aggregate.

D. **Elastomeric Sealant**: Comply with requirements of Division 7 Section "Joint Sealants."

2.05 FINISHES

A. **Metal Surfaces in Contact With Concrete**: Asphaltic paint.

B. **Aluminum: Clear Anodized Surfaces**: AA-M12C22A41 non-specular as fabricated mechanical finish, medium matte chemical finish, and Architectural Class I, 0.7 mils clear anodized coating.

C. **Finial**: Spun aluminum, gold anodized finish.

PART 3 - EXECUTION

3.01 PREPARATION

A. **Prepare in-ground flagpoles** by painting below-grade portions with a heavy coat of bituminous paint.

B. **Excavation**: For foundation, excavate to neat clean lines in undisturbed soil. Remove loose soil and foreign matter from excavation and moisten earth before placing concrete.

C. **Provide forms where** required due to unstable soil conditions and for perimeter of flagpole base at grade. Secure forms, foundation tube, fiberglass sleeve, or anchor bolts in position, braced to prevent displacement during concreting.

D. **Place concrete immediately** after mixing. Compact concrete in place by using vibrators. Moistcure exposed concrete for not less than 7 days or use a nonstaining curing compound.

E. **Trowel exposed concrete** surfaces to a smooth, dense finish, free of trowel marks, and uniform in texture and appearance. Provide positive slope for water runoff to base perimeter.

F. **Coat metal sleeve surfaces** below grade, in contact with cementitious surfaces, and in contact with dissimilar metals with asphaltic paint.

3.02 FLAGPOLE INSTALLATION

A. **Electrically ground** flagpole installation.

B. **Fill foundation tube** sleeve with dry sand and compact.

C. **Install flagpole,** base assembly, and fittings in accordance with manufacturer's instructions.

3.03 ERECTION TOLERANCES: Maximum Variation From Plumb: 1 inch.

3.04 ADJUSTING: Adjust operating devices so halyard and flag function smoothly.

END OF SECTION

SECTION 15050

MECHANICAL GENERAL

PART I - GENERAL

1.1 GENERAL

A. The General Conditions and Supplementary General Conditions are hereby a part of this Section as fully as if repeated herein.

1.2 SCOPE

A. The work includes, but is not necessarily limited to, the furnishing of all labor, materials, equipment, and services necessary for, and reasonably incidental to, providing and installing complete heating, ventilating, and air conditioning systems, exhaust systems, piping systems, plumbing systems, fire protection systems, and other mechanical work as shown or indicated in the Drawings and Specifications.

Specifications define the type of material and the installation procedures to be used in each area. Drawings indicate limits of each area.

B. Consult all other Sections to determine the extent and character of this work specified elsewhere.

C. Specifically refer to the following:

Section 15400 *Plumbing*

D. Make all connections to equipment requiring service from systems installed under this Section.

1.3 COORDINATION

A. Before submitting a bid for the mechanical work the Contractor shall visit the site and become familiar with all the work on other related Drawings and Specifications, and plan the work to provide the best possible assembly of the combined work of all trades. No additional costs will be considered for work which has to be relocated due to conflicts with other trades.

B. If, after examination of the bidding documents relating to the work, the Contractor has queries concerning the nature and scope of the work or intent of the Specifications, he/she shall promptly request clarification from the Architect. After contract award, claims of ignorance of the intent and scope of the contract shall not be allowed.

C. Contractor is responsible for coordinating the schedule of inspections by **Engineer** at appropriate stages of construction such as rough-in, pre-final,

and final, and at other times required by the Specifications or by the construction. Notify **Architect** and **Engineer** seven (7) days in advance of proposed site visit. Notification constitutes certification that construction is, or will be, complete and ready for inspection.

1.4 SAFETY

A. Contractors must conduct a weekly safety meeting with their employees and provide documentation as to attendance and topics of discussion. **Engineer's** construction support services do not constitute review or approval of Contractor's safety procedures. Contractor shall comply with all OSHA regulations. Contractor is required to obtain and pay for insurance required to cover all activities within Contractor's Scope of Work.

1.5 BUILDING LAWS

A. Mechanical work shall conform to all requirements prescribed by governmental bodies having jurisdiction and is to be in accordance with the California Building Code; all federal, state, and local codes and ordinances; all OSHA requirements; California Plumbing Code, California Mechanical Code, California Fire Code, and National Fire Protection Association; California State Code Title 8, Title 21, Title 24; and the Energy Conservation Standards.

B. Should any part of the design fail to comply with such requirements, the discrepancy shall be called to the attention of the Architect prior to submitting bid.

C. Should there be any direct conflict between the Drawings and/or Specifications and the above rules and regulations, the rules and regulations shall take precedence. However, when the indicated material, workmanship, arrangement, or construction is of a superior quality or capacity to that required by above rules and regulations, the Drawings and/or Specifications shall take precedence. Rulings and interpretations of enforcing agencies shall be considered as part of the regulations.

D. After a Contract is awarded, if minor changes or additions are required by the aforementioned authorities, even though such work is not shown on Drawings or overtly covered in the Specifications, they must be included at the Contractor's expense.

E. The Contractor is responsible to coordinate and make adjustments in his/her work with the full set of Contract Drawings and Specifications.

F. All piping, ducts, and equipment shall be securely anchored to building structure as required herein and by the Uniform Building Code.

1.6 **PERMITS, FEES, AND UTILITIES**

A. See Division 1.

1.7 **TEMPORARY CONSTRUCTION WATER**

A. The Plumbing Contractor shall make all arrangements and provide necessary facilities for the temporary construction water from the **Owner's** source. Costs for the temporary construction water shall be paid for by **Owner**.

1.8 **PAINTING**

A. See Section 09900 for painting of piping, equipment, etc.

PART II - PRODUCTS

2.1 **MATERIALS**

A. All materials used shall be new as listed in subheadings and indicated on Drawings. Inspect all materials and immediately remove defective materials from the site.

B. All electrical materials shall bear the label of, or be listed by, the Underwriters' Laboratories (UL), unless the material is of a type for which label or listing service is not provided.

C. Substitution:

1. No substitute materials or equipment may be installed without the written approval of the Engineer.

2. Use of substitute materials or equipment may require changes in associated materials and equipment. Contractor shall submit detailed Shop Drawings and installation instructions of substitute materials and equipment to Architect for approval. Such submittals shall address all changes required in other items.

3. All additional costs incurred by the substitution of material or equipment, or the installation thereof whether Architectural, Structural, Mechanical, Plumbing, or Electrical shall be borne by the Contractor who substitutes the materials or equipment in place of the items specified.

D. Quality of Materials: Pipe fittings and equipment may be taken from stock but the Contractor will be required to submit manufacturer's certificates identifying the material and equipment furnished as conforming with these Specifications and such codes and standards as apply to the equipment

specified. Any material on the site which cannot be identified by manufacturer's mark shall be removed from the site at Engineer's request.

2.2 SUBMITTALS

A. The review of submittals and approval thereof by the Engineer does not relieve the Contractor from compliance with the requirements and intentions of the Drawings and Specifications to which the submittals pertain. The contractor acknowledges its responsibility to submit complete shop drawings and other required submittals. Incomplete submittals will be returned to the contractor unreviewed.

B. Material List: An itemized list of material and equipment which the Contractor proposes to use shall be submitted to the Architect with number of copies indicated and within time indicated.

C. Product Data:

1. Submit all required,= product data, etc. at one time. Submittals shall be bound, tabbed, and properly indexed by Specification Section.

2. Each item shall be identified by manufacturer, brand, and trade name; model number, size, rating, and whatever other data is necessary to properly identify and verify the materials and equipment. The words "AS SPECIFIED" will not be considered sufficient information.

3. Each submittal shall bear the Contractor's stamp and mark indicating the Contractor has reviewed and approved the submittal.

4. Each submitted item shall refer to the Specification Section and paragraph in which the item is specified.

5. Accessories, controls, finish, etc. not required to be submitted or identified with the submitted equipment shall be furnished and installed as specified.

6. Submittals shall be all inclusive with all items requiring submittals being submitted at the same time; individual submittals will not be accepted.

7. Place orders for all equipment in time to prevent any delay in construction schedule or completion of project. If any materials or equipment are not ordered in time, additional charges made by equipment manufacturers to complete their equipment in time to meet construction schedule, together with any special handling charges, shall be borne by Contractor.

PART III - EXECUTION

3.1 DRAWINGS

A. The Drawings show the general arrangement and location of the piping and equipment. Work shall be installed in accordance with the Drawings, except for changes required by conflicts with the work of other trades. The Contractor shall provide for the support, expansion, and pitch of any rearranged piping in conformance with the intent of the Drawings, Specifications, and codes.

B. Note that certain mechanical work is shown, wholly or in part, on Architectural Drawings.

C. Drawings are diagrammatic and are intended to show the approximate location of equipment and piping. Dimensions shown on Drawings shall take precedence over scaled dimensions on Drawings. All dimensions shall be verified in the field by the Contractor.

D. The exact location of apparatus, equipment, and piping shall be ascertained from the Architect or the Architect’s representative in the field, and work shall be laid out accordingly. Should the Contractor fail to ascertain such locations the work shall be changed at Contractor's own expense when so ordered by the Architect. The Architect reserves the right to make minor changes in the location of piping and equipment up to the time of installation without additional cost.

E. It is the intention of the Drawings and Specifications that, where certain mechanical items such as unions, expansion joints, and other mechanical components are not shown, but where such items are required by the nature of the work, shall be furnished and installed.

F. The Mechanical Drawings and Specifications are intended to supplement each other. Any material or labor called for in one shall be furnished even though not specifically mentioned in the other.

G. Pipe and duct sizes shown are the minimum allowable and shall be increased in size if required by code or wherever necessary to meet unusual conditions.

3.2 RECORD DRAWINGS

A. Record Drawings shall be maintained at all times showing the exact location of equipment, ductwork, control panels, piping mains, branches, valves, drains, clean-outs, etc. installed under all Sections. Obtain from the Architect, at cost, a complete set of prints. On these prints systematically and accurately keep a dimensional record of all work installed different from those shown on Drawings. Have these Drawings readily available for reference.

B. Record Set: When above information is complete and acceptable to the Architect transfer this information accurately to reproducible tracings, purchased at cost from the Architect for this purpose, and deliver to the Architect for final review.

C. Upon completion of the Architect's review of the Record Set the Contractor shall incorporate changes, as noted on the record set, including dimensions such as building waste inverts, valves, etc. Deliver transparencies with one (1) set of prints to the Architect. Deliver one (1) complete set of prints to building Owner within ninety (90) days of issuance of final occupancy report.

D. Inspector's Approval: Where a full-time inspector is employed by the **Owner**, the Record Drawing information shall be reviewed by the inspector during the course of construction and shall have the inspector's approval before submission to the Architect.

3.3 MECHANICAL ACCEPTANCE TESTS

A. Documentation on standard State of California Acceptance forms and inspection documents as listed on the project Certificate of Compliance shall be submitted to building department prior to issuance of building permit.

B. The required acceptance documents generated by the responsible person shall be signed by a designated licensed professional before submitting the required documents for final occupancy permit.

3.4 DAMAGE

A. Repair any damage to the building, premises, and equipment occasioned by the work under this Section.

B. Repair all damage to any part of the building or premises caused by leaks or breaks in pipe, or malfunctions of equipment furnished or installed under this Section until the warranty period expiration date.

3.5 COMPLETE WORKING INSTALLATION

A. The Drawings and Specifications do not attempt to list every item that must be installed. When an item is necessary for the satisfactory operation of equipment, is required by the equipment manufacturer, or accepted as good practice, furnish without change in Contract cost.

3.6 STORAGE

A. Provide proper protection and storage of all items and tools required for this work.

3.7 QUALITY OF WORK

A. The quality of work shall be of a standard generally accepted in the respective trade. Use only experienced, competent, and properly equipped workers. Replace work falling below this standard as directed by the Engineer.

B. Systems shall be worked into a complete and integrated arrangement with like elements arranged to make a neat appearing and finished piece of work, with adequate head room and passageway free from obstructions. Such systems shall be installed by laborers experienced in the respective trades involved.

3.8 CONCRETE WALLS AND CONCRETE FOOTINGS

A. Where pipes must pass through concrete walls and footings, they shall pass through SDR 35 PVC pipe sleeves with 1/2" annular space set in place at time of construction.

B. Ducts shall pass through 10 gauge galvanized sheet metal sleeves. Provide sheetmetal closure collars at duct penetration.

C. Sheetmetal sleeves set into concrete walls: Provide steel frame around opening where required by Structural Engineer.

D. Coordinate core drilled openings with Architect and General Contractor. Coordination shall include location, size, and spacing of openings. No slot openings will be allowed. Coordinate openings to avoid critical structural items such as reinforcing bars, tensioning tendons, etc.

E. Also see Paragraph 3.13.

3.9 ELECTRICAL REQUIREMENTS - CONTROLS AND COORDINATION WITH ELECTRICAL CONTRACTOR

A. Mechanical Contractor shall coordinate with the Electrical Contractor on furnishing and installing of controls, motors, starters, etc. Coordinate means informing Electrical Contractor of items requiring electrical connection, providing copies of submittal data, installation data, scheduling work to insure efficient progress, and promptly supplying those items to be installed by Electrical Contractor.

B. The specific requirements for electrical power and/or devices for each and every piece of mechanical and plumbing equipment requiring electrical service, supplied and/or installed under this Contract, shall be coordinated and verified with the Mechanical and Plumbing Drawings, the Mechanical and Plumbing Sections of these Specifications, and with the manufacturers of the mechanical and plumbing equipment supplied. This shall include the voltage, phase, and ampacity; conduit requirements; and exact location

and type of disconnect, control, and/or connection required. Any changes from the Drawings and Specifications required as a result of this coordination shall be part of this Contract.

C. Electrical Contractor shall furnish and install the following for all mechanical equipment:

1. Conduit and wiring for line voltage power to the equipment

D. The work under this Section shall include furnishing and installing all controls on low and manual line voltage, including thermostats, auxiliary switches, relay wiring, interlock wiring; equipment control panels and transformers; and controls conduit unless specifically indicated as part of other work. Materials and methods of the control installation shall be in accordance with the Electrical Specifications.

E. The Mechanical Contractor shall review all wiring connections which have any influence on this equipment or work and verify that these connections are correct before permitting any equipment to be operated which is furnished, installed, or modified under this Contract.

F. Motor starters for roof-mounted exhaust and supply fans or other equipment exposed to rain shall be NEMA Type 3, weatherproof.

3.10 ELECTRICAL EQUIPMENT ROOM PRECAUTIONS

A. Ductwork or piping for mechanical systems shall not be installed in any switchgear room, transformer vault, telephone room or electric closet except as indicated. In any case, no ductwork or piping for mechanical systems shall be installed in the space equal to the width and depth of any electrical service equipment, switchboards, panel boards, or motor control centers and extending from the floor to a height of six feet above the equipment or to the structural ceiling, whichever is lower.

3.11 CUTTING AND REPAIRING

A. No cutting shall be done except with Architect’s approval. Cutting of structural members or footings is prohibited without the prior written consent of the Structural Engineer.

B. Where cutting of paving, walls, ceilings, etc. is necessary for the installation of the mechanical work, it shall be done under the direction of this Section. Damage caused by this cutting shall be repaired to match original and adjacent surfaces without additional expense to the **Owner**. Cutting of new construction shall be by the installing Contractor of that construction as directed by this Contractor.

3.12 PIPE AND VALVE IDENTIFICATION

A. Identify all piping contents with letter legend on color background identifying hazard or use of material.

B. The pipe marker system shall conform completely with "The Scheme for Identification of Piping Systems" (ANSI A13.1 1999 or latest edition).

TABLE 2

Outside Diameter of Pipe or Covering	Length of Color Field	Size of Letters
3/4" to 1-1/4"	8"	1/2"
1-1/2" to 2"	8"	3/4"
2-1/2" to 6"	12"	1-1/4"

C. All pipes 3/4" I.D. and smaller shall be marked with 1-1/2" brass tags equivalent to valve tags.

D. Provide flow markers consisting of labels similar to pipe markers with a large black arrow printed on same background color to indicate direction of flow.

E. Place pipe marker and flow marker on each pipe on both sides of walls or floors through which pipes pass. Place markers adjacent to valves and fittings or branch take-off and for exposed piping locate markers to be clearly visible to person standing on floor, and at not over 30'-0" intervals on all straight runs of pipe.

F. All valves under 3/4" I.D.: 18 gauge brass identification tags 1-1/2" in diameter with depressed 1/2" high black filled letters above 1/2" black filled numbers. Tags shall be fastened securely at specified locations. Valve tags shall show valve number, purpose, and normal condition (open or closed).

G. Tag Locations:

1. Adjacent to each valve and fitting except on plumbing fixtures and equipment

2. At each branch and riser take-off

3. At each pipe passage through wall, floor, and ceiling construction

4. At each pipe passage to underground

5. On all horizontal pipe runs, marked every 25'-0"

3.13 SLEEVES AND SEALING

A. Provide sleeves for all pipes and ductwork passing through new floors, walls, partitions, and any other building construction, of adequate diameter to allow minimum of 3/4" clearance all around between sleeve and pipe or ductwork. Sleeves are not required for holes drilled through existing floors, walls, or partitions (in which case leave specified clearance between hole and pipe or ductwork). When pipe or ductwork is insulated, insulation shall pass continuously through sleeve with 3/4" clearance between insulation and sleeve or hole in existing construction.

B. Lay out work prior to concrete forming. Reinforce sleeves to prevent collapse during forming and curing.

C. All floor sleeves required shall extend 1" above finished floor except through mechanical equipment room floors and shafts where sleeves shall extend 2" above finished floor level. Sleeves through roof shall extend 8" above roof. Wall sleeves shall be flush with face of wall unless otherwise indicated. Waste stacks using carriers shall have sleeves flush with floor and sealed.

D. Sleeves shall permit free thermal expansion of pipe without binding or contact with structure.

E. Do not support pipes by resting pipe clamps on floor sleeves. Supplementary members shall be provided so pipes are floor supported.

F. Special sleeves detailed on Drawings shall take precedence over this Section.

G. Pipe sleeves as scheduled below unless otherwise indicated:

1. Plaster or Drywall:
   18 gauge galvanized steel

2. Concrete or Masonry Walls and Concrete Bases:
   See Paragraph 3.8.

H. Waterproof membraned floors, walls, concrete pits, foundation walls, etc. as detailed or specified in other Sections.

I. Duct Sleeves: Should be as follows unless otherwise indicated. Sleeves specified or indicated at fire dampered penetrations shall take precedence over this article.

1. Plaster or Drywall:
   18 gauge galvanized steel

2. Concrete Floors and Mechanical Equipment Room Floors: See Paragraph 3.8.

J. Sealing of Sleeves or Holes:

1. Waterproof Sleeves or Holes in Floors and Walls: Seal space between pipe and sleeves in exterior walls, foundations, walls, pits, etc. watertight using Link-Seal modular wall and casing seal, or as detailed.

2. Fire Rated Wall and Floor Sleeves or Holes (Insulated Pipe): Caulk space between pipe insulation and sleeve with 3-M brand Fire Barrier Sealant CP-25WB+ or Dow/Corning #3-6548 Silicon RTV Foam, with thickness appropriate for floor or wall fire rating. Seal top of floor sleeve with Tremco Dymeric Sealant.

3. All other sleeves or holes: Sleeves shall be packed with safing insulation and sealed with Tremco Dymeric Sealant.

4. Trim Plates: Provide minimum 1" trim plates at visible sides of openings on all exposed ducts passing through floors, walls, partitions, plaster furring, etc. unless otherwise specified or indicated. Plates shall be prime coated.

3.14 SUPPORTS

A. All equipment, plenums, piping, and ductwork shall be mounted on, or suspended from, foundations and supports as specified and indicated, and seismically braced to structure.

B. Vibration isolation and seismic restraints for vibration isolated equipment per Title 24.

C. All piping, ducts, and equipment shall be securely anchored to building structure as required by the Specifications, SMACNA's "Guidelines for Seismic Restraints of Mechanical Systems", Title 24, and the California Building Code.

D. Earthquake restraints shall be capable of resisting gravity and lateral loads as required by Title 24.

E. Supplemental Supports: Provide supplemental supports to span building structural elements as necessary for equipment foundations and supports. Provide Shop Drawings to Mechanical and Structural Engineers for approval prior to installation.

3.15 ACCESSIBILITY

A. General: Valves, damper operators, filters, thermometers, pressure gauges, clean-out fittings, and indicating equipment or specialties requiring reading, adjusting, inspection, repairing, removal, or replacement shall be conveniently and accessibly located with reference to finished building. Thermometers and gauges installed to be easily read from floor.

B. Panels: No unions, flanges, valves, dampers, controls, or equipment shall be placed in a location that will be inaccessible after the system is complete. Access panels or doors shall be provided where required whether or not shown on Drawings.

C. Access Panels in Walls or Ceilings:

1. Provide access panels in walls or ceilings. Milcor or approved equal, where indicated and where required to provide access to valves, dampers, and other appurtenances. Panels shall be style as selected by Architect and as directed by wall or ceiling construction. Panel size shall be 24" x 24" unless indicated otherwise. Panels in acoustical barriers shall have same transmission loss as barrier. Panels in rated construction shall have same rating as construction in which installed.

2. Door panels shall be no lighter than 14 gauge steel. Doors shall be equipped with concealed spring hinges and flush, screwdriver operated locks, except that key operated locks shall be used for all access doors in walls where door is within 6'-0" of floor. Locks for all key operated doors shall be keyed alike.

3. Doors in ceramic tile surfaces shall be stainless steel or chrome plated. Doors in other finished surfaces shall be prime coated.

D. Equipment Spaces: Provide aisles between equipment and ducts, electrical gear, etc. for complete service and inspection of equipment. Maintain minimum 6'-6" headroom in all access aisles. Maintain minimum 36" clearance at all service panels. Provide minimum clearances at electrical equipment per NEC. Provide 36" wide, 3/4" thick plywood covered catwalks in attics from access door to equipment.

3.16 TESTING

A. Test all piping, ductwork, equipment, and systems as called for in the Specifications. Notify Architect and inspection authorities prior to testing so that they may be witnessed. Protect all personnel and equipment during testing. Where Specifications do not cover specific points or methods, conform to manufacturer's specifications.

3.17 DUCTWORK OPENINGS

A. Locating and sizing of all openings for ductwork through walls, roof, etc. shall be done under this Division. Framing of openings shall be done by the respective trades in whose work the opening is made.

3.18 EQUIPMENT

A. All equipment shall be accurately set and leveled. Supports shall be neatly placed and properly fastened. All equipment shall be fastened in place with bolts.

B. Keep all openings closed with plugs or caps to prevent entrance of foreign matter. Protect all piping, ductwork, fixtures, and equipment against dirt, water, chemical, or mechanical damage both before and after installation. Any equipment or apparatus damaged prior to final acceptance shall be restored to original condition or replaced at the Architect’s discretion and at no additional cost to the Owner.

C. Start-Up: Equipment shall be adjusted, lubricated, aligned, etc. prior to start-up. Inspect each piece of equipment prior to start-up. Start each piece of equipment in accordance with manufacturer's directions and warranty requirements.

D. Finish: Protect all equipment and materials until in use. Any visible rust or corrosion shall be removed as directed prior to installation. All damaged factory painted finishes shall be cleaned and painted with manufacturer provided paint.

3.19 MANUFACTURER'S DIRECTIONS

A. Materials and equipment shall be installed in accordance with manufacturer's application and recommendations, requirements, and instructions, and in accordance with Contract Documents. Where manufacturer's instructions differ from those indicated or specified, they shall be brought to Architect’s attention for resolution prior to equipment ordering and installation.

B. Where requirements indicated in Contract Documents exceed manufacturer's requirements, Contract Documents shall govern.

3.20 FURRING AND PIPE SPACES

A. Spaces provided in the design of the building shall be utilized and the work shall be kept within the furring lines established on the Drawings.

B. Layout: Maintain maximum head room under piping and equipment. Contractor to coordinate line locations with beams, windows, etc. to provide maximum clearance. From Drawings, ascertain heights of

suspended ceilings and size of pipe shafts in which piping is concealed, and location and size of structural members in and adjacent to pipe shafts. Coordinate piping installation with ductwork, lighting, and other equipment. Ensure necessary clearances on trim plates at exposed penetrations of walls and floors. If sufficient room is not available above suspended ceiling or vertical shafts obtain clarification from Architect before work is started.

3.21 CLEAN-UP

A. During the course of work under this Section, all rubbish, debris, surplus materials, tools, etc. resulting from this work shall be removed from work area and shall be disposed of off-site at the end of each working day. The **Owner's** premises shall be left clean and in a condition acceptable to the Architect.

B. Clean all work installed under this Contract to satisfaction of **Owner** and submit documentation that each system has been cleaned and results witnessed by the Architect’s representative.

C. All water distribution and piping systems, including those for cold water and hot water systems, shall be flushed thoroughly until piping is cleaned to satisfaction of the Architect. See other Specification Sections for additional requirements.

D. Remove debris and trash from ductwork, fan units, and all air handling equipment. Vacuum clean fan housing, coils, and ducts in vicinity of openings before grilles and registers are installed. Replace construction filters with new filters prior to project completion.

3.22 FINAL INSPECTION

A. The Contractor shall furnish the Architect with certificates of final inspection and approval from the inspection authorities having jurisdiction.

3.23 GUARANTEE

A. The Contractor shall guarantee the quality of all work and the quality of equipment and materials in accordance with the provisions of the General Conditions and Special Conditions. Should any defects occur during this period, the Contractor shall promptly repair or replace defective items as directed by the Architect, without cost to the Owner.

3.24 SITE VISITS BY ENGINEER

A. Engineer's responsibility is limited to normal construction support services only, consisting of office consultation, site visits, and reports to the Architect at appropriate stages of construction such as rough-in, pre-final,

and final. All costs incurred by the Engineer for additional site visits or office work required to complete the project as the result of incomplete coordination or supervision by the Contractor or the Mechanical Sub-Contractor shall be paid for by the Contractor.

3.25 OPERATING AND MAINTENANCE MANUALS

A. Three (3) complete sets of bound instructions containing the manufacturer's operating and maintenance instructions for each piece of equipment shall be furnished to the Owner within ninety (90) days of issuance of final occupancy permit. Each set shall be permanently bound and shall have a hard cover. The following identification shall be inscribed on the covers, "OPERATING AND MAINTENANCE INSTRUCTIONS", the name and location of the building, the name of the Contractor, and the Contract number. Flysheets shall be placed before instructions covering each subject. The instruction sheets shall be approximately 8-1/2"x 11" with large sheets of Drawings folded in. The instructions shall include, but not be limited to, the following:

1. System layout showing piping, valves and controls with complete valve and control identification, listing, and indexing valve charts.

2. Approved wiring and control diagrams.

3. A detailed control sequence describing start-up operation and shut-down with reference to valve and control names and numbers.

4. Operating and maintenance instructions for each piece of equipment including lubrication instructions. Include information on frequency of lubrication, filter change, belt adjustment, cleaning, adjusting, etc.

5. Manufacturer's bulletins, cuts, and descriptive data.

6. Parts list and recommended spare parts including name and address of source of supply.

B. Field Instructions: Upon completion of the work and at a time designated by the Owner the services of one or more competent persons shall be provided by the Contractor to instruct a representative of the Owner in the operation and maintenance of the systems. These field instructions shall cover all the items contained in the bound instructions and shall be of a sufficient length and detailed nature, in the Engineer's judgment, to insure safe and efficient operation.

END OF SECTION

SECTION 15400

PLUMBING

PART I - GENERAL

1.1 GENERAL

A. The General Conditions, any Supplementary Conditions, Section 15050, *Mechanical General*, and Division 1 are hereby a part of this Section as fully as if repeated herein.

B. Contractor to rough-in, connect, and install Owner furnished items

1.2 SUBMITTALS

A. Submit for review, within fifteen (15) days after signing Contract, the required number of copies of a complete list of materials proposed for use, including sizes, capacities, etc. See Division 1 and Section 15050 for requirements. This list includes:

1. Plumbing Fixtures and Trim
2. Drains and Clean-outs
3. Pipe and Fittings
4. Valves, Unions, and Hose Bibbs
5. Pipe Hangers and Supports
6. Plumbing Equipment
7. Insulation for Pipe and Fittings

B. Copies of a portfolio with a full description of fixtures and trim shall be submitted with the materials list.

C. No substitute materials or equipment may be installed without the written approval of the Architect.

D. All additional costs incurred by the substitution of material or equipment, or the installation thereof, whether architectural, structural, mechanical, electrical, or plumbing, shall be borne by Contractor who substitutes material or equipment in lieu of that specified.

PART II - PRODUCTS

2.1 SOIL, WASTE, DRAIN, AND VENTING SYSTEMS

A. Pipe and Fittings:

Soil, waste, drain, and vent pipe shall be Charlotte Pipe, PVC Schedule 40 solid wall, (ASTM D-1784) and shall be IAPMO approved, with solvent weld socket DWV fittings.

2.2 WATER PIPING SYSTEM

A. All potable water system materials shall comply with NSF/ANSI Standard 61, Annex G for low lead requirements of 0.25% lead content.

B. Piping: Hard copper water tube, conforming to ASTM B88 (Type "K" underground, Type "L" above ground) with wrought copper fittings.

C. Valves: All valves shall be the product of a single manufacturer – Milwaukee or NIBCO, 125 PSIG steam service rated and 300 PSI air and water rated. All valves shall be low lead type per NSF/ANSI standard 61.

1. Ball Valves: Milwaukee UPBA100 standard port screwed, bronze valve.

2. Check Valves: Milwaukee UP509T screwed, bronze, swing check (provide non-slam check on pumped equipment or quick-closing fixtures).

D. Unions: Mueller #C-107, Crane, or approved equal in copper piping; Stockham Figure 694, Crane, or approved equal, galvanized malleable iron, brass seat in steel lines; Epco, Crane, or approved equal, dielectric unions where copper connects to steel.

E. Shock Absorbers:

1. Provide on hot and cold water lines at quick closing valves such as flush valves, solenoid valves, etc.

2. Sized and located in accordance with Plumbing and Drainage Institute Manual WH 201.

3. Provide access panels at locations where shock absorbers are not accessible. See applicable paragraph for types. Location to be approved by the Architect

F. Pipe and Fitting Insulation:

1. Flexible Unicellular Polyolefin Foam:

a. IMCOA: Model IMCOLOCK with pre-slit longitudinal seam with each mating surface adhesive coated and protected with a tear resistant release liner. Model: IMCOSHIELD traditional solid tube for slide on application.

b. Insulation: Flexible Unicellular Polyolefin in tubular form complies with the property requirements of the following Specifications: ASTM C634, ASTM E84 (25/50), UL723 (25/50), NFPA 255 (25/50), California Code (UBC) 42-1, Class I, UL-94HBF, FMVSS-302.

G. Access Panels: MILCOR or approved equal, prime coated, size determined by equipment requiring access. Access panels in restrooms shall be stainless steel.

2.3 PIPE HANGERS AND SUPPORTS

A. Clevis Hangers: Superstrut CL-710, UL and FM approved, solid all thread rods and rod clips. Superstrut 540 for wood construction and C-755 or C-769 for I-beam clamps. Pre-drill and secure with lag bolts.

B. Supports and Beam Clamps: Superstrut C-769, Hubbard Holdrite, or approved equal.

C. Concrete Inserts: Superstrut 452 for concrete construction installed with reinforcing bar.

D. Trapeze Hangers: Superstrut, Hubbard EZ-Strut, or equal, channel with pipe clamps and guides as required (include type to be used in submittals).

E. Riser Clamps: Superstrut, Hubbard Holdrite, or approved equal.

F. Offset Pipe Clamps: Superstrut, Hubbard Holdrite, or approved equal.

G. Pipe Isolation: Hubbard Holdrite Silencer System.

H. Sway Bracing: Where hanger rods on horizontal runs of 2 1/2" pipe and larger are 12" in length or longer from support point to top of pipe, there shall be one 3/16" x 1 1/4" steel angle brace, Superstrut (A-1200 channel) bolted to every other pipe hanger clamp and anchored to the structure. Stays to ceiling or roof shall rise at a 45° angle and be anchored per the Drawings. Alternate braces shall be installed on opposite sides.

I. Plumbers tape or sheet-metal straps shall not be used for hanging or supporting of pipes.

J. Space hangers and supports for horizontal copper and steel pipe according to the following schedule:

Pipe Size	Maximum Spacing	Rod Size
1/2"	5'-0"	3/8"
3/4" to 2"	6'-0"	3/8"
2 1/2" and 3"	10'-0"	1/2"
4" to 5"	14'-0"	5/8"

K. Provide two (2) hangers per section of horizontal cast iron pipe and within 18" of each joint.

2.4 PIPE SIZES TO EQUIPMENT

A. Pipe sizes indicated, including required valving, shall be carried full size to equipment served. Any change of size to match equipment connection shall be made within 1'-0" of equipment. All temperature control valves with sizes smaller than connected lines, reduction shall be made immediately adjacent to valve.

2.5 CLEAN-OUTS

A. General: Provide Zurn, Josam or Jay R. Smith clean-outs where indicated and required by code. Same size as main with maximum size of 4". Zurn numbers used as basis of selection unless otherwise noted.

B. Floor Clean-outs (FCO): Zurn ZN1400-2 round top floor clean-out with nickel-bronze head.

C. Wall Clean-outs (WCO): Zurn ZN1460-8 clean-out, cast brass countersunk plug, and stainless steel access cover plate secured to plug by countersunk screw. For hub pipe, Zurn ZN1440-1

D. Unfinished Areas (GCO): Zurn Z1420-25 cast iron clean-out, fitted with brass countersunk plug. For hub pipe, Zurn Z1440

E. Grass or Planting Area (CO): Zurn 1449 located in a concrete box and cover or in cast iron box and cover with concrete apron per project details.

2.6 UNIONS AND FLANGES

A. Unions: Provide unions as follows:

1. At each threaded or soldered connection to equipment and tanks.

2. At one threaded connection to each manually operated threaded valve and cock and each threaded check valve.

3. At each connection to threaded or soldered automatic valves.

4. Other locations as indicated.

2.7 **TRAPS**

A. General: Provide traps on all fixtures connected to soil systems, except for fixtures having integral traps, and arrange so discharge from any fixture will not pass through more than one trap before reaching sewer. All traps shall have seal of not less than 2", nor more than 4".

B. Exposed Pipe: Exposed traps for fixtures shall be chromium plated 17 gauge cast brass

2.8 **DRAINS**

A. General: Provide Zurn or Jay R. Smith drains of sizes shown and types herein specified. Drains inside caulked or threaded outlet as required. Provide clamping collars for drains in areas except slab on grade and trap primer connections on all drains. Zurn numbers used as basis of selection unless otherwise noted. See Fixture Connection Schedule on P0.1

2.9 **PLUMBING FIXTURES**

A. General: Provide new plumbing fixtures of type herein specified and quality shown. Lavatories and sinks to be provided with number of holes required by faucet only, unless otherwise specified.

B. Fixtures: Complete with fittings, supports, fastening devices, faucets, valves, traps, and appurtenances required.

C. Vitreous Ware: Non-absorbent china of even color and unmarked.

D. Fittings and Fixtures: Heavy brass castings properly finished and chrome-plated.

E. Exposed IPS Piping, Nipples to Stops and Tubing: 85% red brass, chrome-plated

F. Escutcheons: Brass, chrome-plated.

G. Warranty: All fixtures warranted not to craze, color, or scale.

H. Connections: Equal height, plumb and set at right angles to floor, wall, or both, unless otherwise required or specified.

I. Fixture Locations: As shown on Architectural Drawings.

J. Fixture Type: All fixtures shall be by one manufacturer unless otherwise noted.

2.10 **MANUFACTURERS**

A. China or Cast Iron Fittings: American Standard or Kohler.

B. Stainless Steel Fixtures: Just, or Elkay. Minimum 18 gauge stainless steel unless specified otherwise.

C. Fixture Trim: Where American Standard is specified, Kohler or Chicago shall be acceptable and shall be the product of a single manufacturer.

D. Carriers: Jay R. Smith, Zurn, or MIFAB. Zurn numbers used as basis for selection where specific selection is shown. Determine from Drawings required hand and type.

E. Flush Valves: Moen

F. Toilet Seat: Olsonite, Church, or Beneke.

PART III - EXECUTION

3.1 **EXCAVATING AND BACKFILLING**

A. Perform all necessary excavation and backfill required for installation of mechanical work. Any work damaged during excavation and backfilling shall be repaired at Contractor's expense.

B. Verification of Existing Conditions:

1. It shall be one of the responsibilities under this Section to examine the site of work and, after investigation, to determine the character of the materials to be encountered and the existing conditions affecting the work.

2. Excavation shall be unclassified and shall include the removal of all buried obstructions within the area to be excavated.

C. Trench for underground pipelines shall be to the required depths. Maintain excavations free of water while installing pipe and until backfilling.

D. Tamp bottom of trenches to uniform grade and excavate bell holes where necessary to insure that pipe rests for entire length on solid ground. Should rock be encountered, excavate to 6" below bottom of pipe and rock surface with well tamped and compacted 1/2" to 1 1/2" broken stone or gravel sand before laying pipe.

E. When piping has been installed, tested, inspected, and approved, backfill excavations with clean earth from excavation or with imported sandy soil in layers not exceeding 8"; moisten and machine tamp and restore the ground or paving to original condition.

F. Backfill shall be compacted to a density of 90% as determined by the laboratory test procedure in ASTM D1557.

G. During progress of work, Owner may have compaction tests made under direction of testing laboratory for all compacted fill. If found not to meet Specification, Contractor shall excavate and re-compact fill at no additional cost to Owner.

H. Following backfilling, grade all trenches to level of surrounding sub-grade. All excess soil shall be located per Owner's instructions.

I. After backfilling, remove from the premises all surplus earth resulting from this work and dispose of same off the site.

3.2 **PIPING - GENERAL**

A. Thoroughly clean all pipe and maintain in clean condition during construction temporarily capping or plugging ends of pipe when not being worked on.

B. Cut pipes accurately to measurements established at the site and work into place without springing or undue forcing and out of the way of openings, ductwork, and equipment; ream ends of screwed pipes and tubing to original bore before connecting together.

C. Run piping concealed except as noted otherwise with vertical lines plumb and horizontal lines installed to maintain uniform slope.

D. Protect all piping located over switchboards, electrical machinery, or equipment against condensation.

E. Arrange water piping for drainage at low points; place drain valves to be accessible.

F. Isolate all water piping from hangers, walls, etc. with Hubbard Holdrite Silencer System or approved equal, to alleviate any noise transmission when water is flowing.

G. Make joints in cast iron piping with neoprene compound applied to male threads only.

H. Make up screw joints with approved pipe joint compound applied to male threads only.

I. Solder joints in copper tubing with lead free soft solder and flux. All joints to be cleaned bright before soldering

J. Where changes in pipe size occur, use only reducing fittings. For drainage pipe changes in direction, use long sweep bends where possible; otherwise, use short sweep 1/4 bends or combination Wye and 1/8 bends.

Use sanitary Tee branches only for horizontal branches discharging to stacks.

K. Unions: Provide screwed unions or flanges in locations required for disconnecting and connecting of all equipment, traps, by-passes, and fixture traps.

L. Flash roof vent piping through roof with 24 gauge or heavier galvanized flashing. Make watertight with black fibrous mastic. Extend flashing into roofing felt 12" from pipes.

M. Pipe runs in masonry and concrete floors shall be sleeved for protection. Use SDR 35 PVC piping at least one size larger than piping run.

N. Chase or sleeve all lines rising in footings and where running concealed through walls.

O. Caulk space between pipes and sleeves in exterior walls and in concrete slabs with graphite packing and waterproof plastic compound; caulk with Dow Corning #3-6548 Silicone RTV Foam per manufacturer's recommendations at fire walls.

P. Where pipes pass through slabs with waterproofing membrane, install 16 oz copper flashing sleeves at a minimum of 8" from edge of sleeve. Caulk space between pipe and sleeve with non-hardening mastic.

Q. Place escutcheons, stamped with 16 gauge steel and chromium plated, on pipes passing through sleeves in walls, floors or ceiling where exposed to view within a finished area. Grout in all other lines.

R. Water pipe is sized per 5 FPS velocity to eliminate water hammer arrestors. Do not change pipe sizing from Drawings.

S. Support piping where necessary at sufficiently close intervals (and 24" from each fitting and change of direction) to keep it in alignment and to prevent sagging.

T. All exposed pipe and trim at fixtures shall be chrome-plated.

U. Anchor vertical risers with hooks, brackets, or clamps to make rigid.

V. All changes of direction of piping shall be made with fittings. Do not bend pipe or hard copper water tubing.

3.3 PIPING INSTALLATION

A. General: Piping installed approximately as indicated, direct as possible without unnecessary offsets or fittings, and parallel with building lines. Install vertical risers plumb. Locate valves for accessibility. Point out to

Architect when there is an obstacle in the way of valve accessibility before installing valve.

B. Layout: Maintain maximum head room under piping. Contractor to coordinate line locations with beams, windows, etc. to provide maximum clearance. From Drawings, ascertain heights of suspended ceilings and size of pipe shafts in which piping is concealed, and location and size of structural members in and adjacent to pipe shafts. Coordinate piping installation with ductwork, lighting, and other equipment. Necessary clearances on trim plates at exposed penetrations of walls and floors. If sufficient room is not available above suspended ceiling or vertical shafts, obtain clarification from Architect before work is started.

C. Slopes: Horizontal piping shall slope uniformly without sags or humps to provide for complete drainage of systems and elimination of air. Low points shall have drain valves accessibly located. High points in closed systems shall be vented by manual air vents. Drainage piping shall slope as required by code or as indicated.

3.4 SOIL, WASTE, DRAIN, AND VENTING

A. Installation:

1. Run piping in the approximate location shown on the Drawings, graded 1/4" per foot in buildings. Lay sewers in straight lines at a uniform grade of 1/4" per foot or as noted on the Drawings.

2. Keep stopper in mouth of pipe when pipe laying is not in progress.

3. Prior to starting any new work, run waste piping adjacent to existing piping from existing main waste, and make connections on off hours so as to maintain operating of any existing facilities. Contractor to inquire from Owner the time to make tie-in to existing systems

4. Install traps and fresh air inlets where required by code regulations.

5. Extend vents through roof. Vents may be combined in accordance with the California Plumbing Code. (Combination of cross section of all venting piping in each building shall equal the waste size cross section leaving that building.)

6. Install clean-outs at ends of horizontal runs in excess of 5'-0" and every 100'-0" of horizontal run

7. Make up clean-out plugs with graphite and oil to facilitate easy removal.

8. Deliver to the Owner at completion of work two (2) suitable wrenches for each type of clean-out installed.

9. Take necessary precautions to protect clean-outs during course of construction.

10. All drains shall be properly trapped and vented and supplied with water where required by code authorities. Give special care to drains located in areas that are pitched for drainage so that uniform slope will be obtained.

3.5 WATER PIPING SYSTEM

A. Installation:

1. Extend piping for hot and cold water, including mains, risers and supplies to fixtures and indicated equipment.

2. Pitch piping as required for drainage.

3. Insulate all domestic hot and hot water return piping and fittings.

4. Make changes in pipe sizes with reducing tees or reducer fittings. Use of bushings or street elbows is not permitted.

5. Install a ball valve in each domestic water line to each fixture group so that each group can be shut off without shutting down the other parts of the system.

6. Install unions on each branch line that are not flanged type fittings, adjacent to each screwed valve, on all lines connecting to equipment, and where otherwise indicated.

7. Water heater temperature and pressure relief to run to fixture indicated on Drawings. Provide air gaps as required by code.

8. No water piping will be permitted below slab on grade (unless shown on Drawings).

3.6 FABRICATION

A. Cut pipe accurately to measurements established at building; work into place without springing or forcing; and clear all windows, doors, and other openings. Cutting or other weakening of building structure to facilitate piping installation not permitted. Ream all piping to remove burrs and install to permit free expansion and contraction without damage. Make all changes in direction with fittings and changes in main sizes through eccentric reducing fittings with top of pipe flat. Piping at tanks, converters, generators, pumps, etc. supported independently so pipe weight is not supported by equipment. Provide the following:

1. Swing joints or run-outs to equipment with swing connections, expansion loops, and/or devices at all other points for flexible piping system.

2. Shut-off valves, balancing valves, and unions or flanges at each branch and in supply and return to each item of equipment. Valves and unions or flanges suitably located to isolate each unit; branch circuit or section of piping to facilitate maintenance and removal of all equipment and apparatus.

3. Drain piping from relief valves, etc. to spill over open sight drains, floor sinks, or other acceptable discharge points terminating drain line with plain end (unthreaded) pipe and with minimum 1" air gap.

4. Caps or plugs for all open ends of pipe and equipment during installation to keep out dirt and other foreign matter.

5. Necessary temporary connections, valves, oversize flushing connections, pumps, etc. as required to properly clean and test system.

3.7 TESTING, ADJUSTING, AND CLEANING

A. Test all piping, valves, clean-outs, etc. as listed below and provide the Architect with certified copies of test results. The inspection authority having jurisdiction and the supervising Architect shall be notified at least 24 hours prior to performance of all tests so that they may be witnessed.

1. All water piping shall be tested to 100 PSIG with potable water and held for 8 hours without drop in pressure before it is covered and concealed. Equipment and personnel shall be protected from this test pressure.

2. All parts of the soil and waste system shall be tested hydraulically by filling to the highest vent point with water. Piping may be tested in sections but shall be subjected to a head not less than 10'-0". Stand-pipe installed for head test shall be 2" minimum. Test pressure shall be held for 15 minutes before inspection starts and water level shall remain stationary for not less than 1 hour.

B. Adjust and regulate all faucets, valves, water heating equipment, etc. and turn over to the Owner in perfect working order.

C. Floor drain strainers and clean-out covers shall be freed, cleaned, and polished.

D. Upon completion of the work, clean all equipment and piping installed under this Section and thoroughly wash and polish all plumbing fixtures, fittings, and trim, removing labels therefrom.

3.8 CHLORINATION

A. Upon completion of all tests and necessary replacements, all domestic water piping shall be disinfected. Chlorination shall be accomplished by personnel in employ of a firm licensed to do this type of work. After the work has been accomplished, provide the Owner and Architect with a statement from the laboratory indicating the water is suitable for human consumption.

B. The system shall be charged with a chlorine solution of at least 50 PPM residual chlorine. The solution shall be distributed evenly throughout the system until flowing out furthest outlets. The strong chlorine solution shall remain in the system for a minimum of 24 hours. The strength of the solution shall be confirmed at over 10 PPM at the end of the 24 hour period.

C. Flush thoroughly and submit bacteriological samples to a certified laboratory which shall certify in writing that the water is suitable for drinking.

3.9 VALVE TAGS, PIPE TAGS, AND CHARTS

A. See Section 15050.

3.10 OPERATIONAL AND MAINTENANCE MANUAL

A. Three (3) copies of operational and maintenance manuals are to be supplied to the Architect per Section 15050.

END OF SECTION

SECTION 16000

GENERAL ELECTRICAL REQUIREMENTS

PART 1 – GENERAL

1.01 Description of Work:

A. The work of this Section consists of providing all required labor, supervision, materials and equipment to satisfactorily complete all electrical installations that are shown on the Drawings, included in these specifications, or otherwise needed for a complete and fully operating facility.

B. Furnish and install all required in-place equipment, conduits, conductors, cables and any miscellaneous materials for the satisfactory interconnection and operation of all associated electrical systems.

1.02 Related Work:

A. This Section provides the basic Electrical Requirements which supplement the General Requirements of Division 1 and apply to all Sections of Division 16.

1.03 Submittals:

A. As specified in Division 1. Submit to the Architect shop drawings, manufacturer's data and certificates for equipment, materials and finish, and pertinent details for each system specified. Information to be submitted includes manufacturer's descriptive literature of cataloged products, equipment, drawings, diagrams, performance and characteristic curves as applicable, test data and catalog cuts. Obtain written approval before procurement, fabrication, or delivery of the items to the job site. Partial submittals are not acceptable and will be returned without review. Furnish manufacturer's name, trade name, catalog model or number, nameplate data, size, layout dimensions, capacity, project specification and paragraph reference, applicable Federal, Industry and Technical Society Publication References, and years of satisfactory service of each item required to establish contract compliance. Photographs of existing installations and data submitted in lieu of catalog data are not acceptable and will be returned without approval.

B. Organize submittals for equipment and items related to each specification section together as a package.

C. Proposed substitutions of products will not be reviewed or approved prior to awarding of the Contract.

D. Substitutions shall be proven to the Architect or Engineer to be equal or superior to the specified product. Architect’s decision is final. The Contractor shall pay all costs incurred by the Architect and Engineer in reviewing and processing any proposed substitutions whether or not a proposed substitution is accepted.

E. If a proposed substitution is rejected, the contractor shall furnish the specified product at no increase in contract price.

F. If a proposed substitution is accepted, the contractor shall be completely responsible for all dimensional changes, electrical changes, or changes to other work which are a result of the substitution. The accepted substitution shall be made at no additional cost to the owner or design consultants.

1.04 Quality Assurance:

A. Codes: All electrical equipment and materials, including installation and testing, shall conform to the latest editions following applicable codes:

1. California Electrical Code (CEC).

2. Occupational Safety and Health Act (OSHA) standards.

3. All applicable local codes, rules and regulations.

4. Electrical Contractor shall posses a C-10 license and all other licenses as may be required. Licenses shall be in effect at start of this contract and be maintained throughout the duration of this contract.

B. Variances: In instances where two or more codes are at variance, the most restrictive requirement shall apply.

C. Standards: Equipment shall conform to applicable standards of American National Standards Institute (ANSI), Electronics Industries Association (EIA), Institute of Electrical and Electronics Engineers (IEEE), and National Electrical Manufacturers Association (NEMA).

D. Underwriter Laboratories (UL) listing is required for all equipment and materials where such listing is offered by the Underwriters Laboratories. Provide service entrance labels for all equipment required by the NEC to have such labels.

E. The electrical contractor shall guarantee all work and materials installed under this contract for a period of one (1) year from date of acceptance by owner.

F. All work and materials covered by this specification shall be subject to inspection at any and all times by representatives of the owner. Work shall not be closed in or covered before inspection and approval by the owner or his representative. Any material found not conforming with these specifications shall, within 3 days after being notified by the owner, be removed from premises; if said material has been installed, entire expense of removing and replacing same, including any cutting and patching that may be necessary, shall be borne by the contractor.

1.05 Contract Documents:

A. Drawings and Specifications:

1. In the case of conflict between the drawings and specifications, the specifications shall take precedence.

2. Drawings and specifications are intended to comply with all law, ordinances, rules and regulations of constituted authorities having jurisdiction, and where referred to in the Contract Documents, said laws, ordinance, rules and regulations shall be considered as a part of said Contract Documents within the limits specified. The Contractor shall bear all expenses of correcting work done contrary to said laws, ordinance, rules and regulations if the Contractor knew or should have known that the work as performed is contrary to said laws, ordinances, rules and regulations and if the Contractor performed same (1) without first consulting the Architect for further instructions regarding said work and/or (2) disregarded the Architect's instructions regarding said work.

B. Drawings: The Electrical Drawings shall govern the general layout of the completed construction.

1. Locations of equipment, panels, pullboxes, conduits, stub-ups, ground connections are approximate unless dimensioned; verify locations with the Architect prior to installation.

2. Review the Drawings and Specification Divisions of other trades and perform the electrical work that will be required for those installations.

3. Should there be a need to deviate from the Electrical Drawings and Specifications, submit written details and reasons for all changes to the Architect for approval.

4. The general arrangement and location of existing conduits, piping, apparatus, etc., is approximate. The drawings and specifications are for the assistance and guidance of the contractor, exact locations, distances and elevations are governed by actual field conditions. Accuracy of data given herein and on the drawings is not guaranteed. Minor changes may be necessary to accommodate work. The contractor is responsible for verifying existing conditions. Should it be necessary to deviate from the design due to interference with existing conditions or work in progress, claims for additional compensation shall be limited to those for work required by unforeseen conditions as determined by the Architect.

5. All drawings and divisions of these specifications shall be considered as whole. The contractor shall report any apparent discrepancies to the Architect prior to submitting bids.

6. The contractor shall be held responsible to have examined the site and compared it with the specifications and plans and to have satisfied himself as to the conditions under which the work is to be performed. He shall be held responsible

for knowledge of all existing conditions whether or not accurately described. No subsequent allowance shall be made for any extra expense due to failure to make such examination.

1.06 Closeout Submittals:

A. Manuals: Furnish manuals for equipment where manuals are specified in the equipment specifications or are specified in Division 1.

1.07 Coordination:

A. Coordinate the electrical work with the other trades, code authorities, utilities and the Architect.

B. Provide and install all trenching, backfilling, conduit, pull boxes, splice boxes, etc. for all Utility Company services to the locations indicated on the Drawings. All materials and construction shall be in accordance with the requirements for all the Utility Companies. Prior to performing any work, the Electrical Contractor shall coordinate with the various Utility Companies and obtain utility company engineering drawings. Verify that all such work and materials shown on the Drawings are of sufficient sizes and correctly located to provide services on the site. The Electrical Contractor shall verify with all the Utility Companies that additional contractor furnished and installed work is not required. If additional work, materials, or changes are required by any of the Utility Companies, the Electrical Contractor shall advise the Architect of such changes and no further work shall then be performed until instructed to do so by the Architect. The Electrical Contractor shall coordinate with the various Utility Companies to schedule inspections and to obtain service connections.

C. The Electrical Contractor shall schedule all utility work necessary for utility inspections, connections, cable installation, etc. for the new electrical service to meet the construction schedule.

D. Utility Company charges shall be paid by the Owner.

E. Contractor shall pay all inspection and other applicable fees and procure all permits necessary for the completion of this work.

F. Where connections must be made to existing installations, properly schedule all the required work, including the power shutdown periods.

G. When two trades join together in an area, make certain that no electrical work is omitted.

1.08 Job Conditions:

A. Operations: Perform all work in compliance with Division 1.

1. Keep the number and duration of power shutdown periods to a minimum.

2. Show all proposed shutdowns and their expected duration on the construction schedule. Schedule and carry out shutdowns so as to cause the least disruption to operation of the Owner's facilities.

3. Carry out shutdown only after the schedule has been approved, in writing, by the owner. Submit power interruption schedule 15 days prior to date of interruption.

B. Construction Power: Unless otherwise noted in Division 1 of these specifications, contractor shall make all arrangements and provide all necessary facilities for temporary construction power from the owner's on site source. Energy costs shall be paid for by the Owner.

C. Storage: Provide adequate storage for all equipment and materials which will become part of the completed facility so that it is protected from weather, dust, water, or construction operations.

1.09 Damaged Products:

A. Notify the Architect in writing in the event that any equipment or material is damaged. Obtain approval from the Architect before making repairs to damaged products.

1.10 Locations:

A. General: Use equipment, materials and wiring methods suitable for the types of locations in which they are located.

B. Dry Locations: All those indoor areas which do not fall within the definition below for Wet Locations and which are not otherwise designated on the Drawings.

C. Wet Locations: All locations exposed to the weather, whether under a roof or not, unless otherwise designated on the Drawings.

1.11 Safety and Indemnity:

A. The Contractor is solely and completely responsible for conditions of the job site including safety of all persons and property during performance of the work. This requirement will apply continually and not be limited to normal working hours. The contractor shall provide and maintain throughout the work site proper safeguards including, but not limited to, enclosures, barriers, warning signs, lights, etc. to prevent accidental injury to people or damage to property.

B. No act, service, drawing review or construction review by the Owner, the Engineer or their Consultants is intended to include reviews of the adequacy of the Contractors safety measures in or near the construction site.

C. The Contractor performing work under this Division of the Specifications shall hold harmless, indemnify, and defend the Owner, the Engineer, their consultants, and each

of their officers, agents and employees from any and all liability claims, losses, or damage arising out of or alleged to arise from bodily injury, sickness, or death of a person or persons and for all damages arising out of injury to or destruction of property arising directly or indirectly out of or in connection with the performance of the work under this Division of the Specifications, and from the Contractor's negligence in the performance of the work described in the construction contract documents, but not including liability that may be due to the sole negligence of the Owner, the Engineer, their Consultants or their officers, agents and employees.

D. If a work area is encountered that contains hazardous materials, the contractor is advised to coordinate with the owner and it's abatement consultant for abatement of hazardous material by the Owner's Representative. "Hazardous materials" means any toxic substance regulated or controlled by OSHA, EPA, State of California or local rules, regulations and laws. Nothing herein shall be construed to create a liability for Aurum Consulting Engineers regarding hazardous materials abatement measures, or discovery of hazardous materials.

1.12 Access Doors:

A. The contractor shall install access panels as required where floors, walls or ceilings must be penetrated for access to electrical, control, fire alarm or other specified electrical devices. The minimum size panel shall be 14" x 14" in usable opening. Where access by a service person is required, minimum usable opening shall be 18" x 24".

B. All access doors installed lower than 7'-0" above finished floor and exposed to public access shall have keyed locks.

C. Where specific information or details relating to access panels differ from Division 16 paragraph 1.12 of these specifications, or shown on the electrical drawings and details or under other Divisions of work, those requirements shall supersede these specifications.

1.13 Arc Flash:

A. The contractor shall install a clearly visible arc flash warning to the inside door of all panelboards and industrial control panels, as well as to the front of all switchboards and motor control centers that are a part of this project.

B. The warning shall have the following wording: line 1 "WARNING" (in large letters), line 2 "Potential Arc Flash Hazard" (in medium letters), line 3 & 4 "Appropriate Personal Protective Equipment and Tools required when working on this equipment".

1.14 Emergency Boxes:

A. All boxes and enclosures for emergency circuits shall be permanently marked with a readily visible red spray painted mark.

PART 2 - PRODUCTS

2.01 Standard of Quality:

A. Products that are specified by manufacturer, trade name or catalog number establish a standard of quality and do not prohibit the use of equal products of other manufacturers provided they are established to be equal to the specified product and approved by the Architect prior to installation.

B. Material and Equipment: Provide materials and equipment that are new and are current products of manufacturers regularly engaged in the production of such products. The standard products shall have been in satisfactory commercial or industrial use for two years prior to bid opening. The two-year period includes use of equipment and materials of similar size under similar circumstances. For uniformity, only one manufacturer will be accepted for each type of product.

C. Service Support: Submit a certified list of qualified permanent service organizations including their addresses and qualification for support of the equipment. These service organizations shall be convenient to the equipment installation and able to render service to the equipment on a regular and emergency basis during the warranty period of the contract.

D. Manufacturer's Recommendations: Where installation procedures are required to be in accordance with manufacturer's recommendations, furnish printed copies of the recommendations prior to installation. Installation of the item shall not proceed until recommendations are received. Failure to furnish recommendation shall be cause for rejection of the equipment or material.

2.02 Nameplates:

A. For each piece of electrical equipment, provide a manufacturer's nameplate showing his name, location, the pertinent ratings, the model designation, and shop order number.

B. Identify each piece of equipment and related controls with a rigid laminated engraved plastic nameplate. Unless otherwise noted, nameplates shall be melamine plastic 0.125 inch thick, white with black center core. Surface shall be matte finish. Corners shall be square. Accurately align lettering and engrave into the core. Minimum size of nameplates shall be 0.5 by 2.5 inches unless otherwise noted. Where not otherwise specified, lettering shall be a minimum of 0.25 inch high normal block style. Engrave nameplates with the inscriptions indicated on the Drawings and, if not so indicated, with the equipment name. Securely fasten nameplates in place using two stainless steel or brass screws.

2.03 Fasteners:

A. Fasteners for securing equipment to walls, floors and the like shall be either hot-dip galvanized after fabrication or stainless steel.

2.04 Finish requirements:

A. Equipment: Refer to each electrical equipment section of these Specifications for painting requirements of equipment enclosures. Repair any final paint finish which has been damaged or is otherwise unsatisfactory, to the satisfaction of the Architect.

B. Wiring System: In finished areas, paint all exposed conduits, boxes and fittings to match the color of the surface to which they are affixed.

PART 3 - EXECUTION

3.01 Workmanship:

A. Ensure that all equipment and materials fit properly in their installation.

B. Perform any required work to correct improperly fit installation at no additional expense to the owner.

C. All electrical equipment and materials shall be installed in a neat and workmanship manner in accordance with the "NECA-1 Standard Practices for Good Workmanship in Electrical Contracting". Workmanship of the entire job shall be first class in every respect.

3.02 Equipment Installations:

A. Provide the required inserts, bolts and anchors, and securely attach all equipment and materials to their supports.

B. Do all the cutting and patching necessary for the proper installation of work and repair any damage done.

C. Earthquake restraints: all electrical equipment, including conduits over 2 inches in diameter, shall be braced or anchored to resist a horizontal force acting in any direction as per CBC Section 1616A Title 24, part 2 and ASCE7-10, Sections 13.3 and 13.6 and Table 13.6-1.

D. Structural work: All core drilling, bolt anchor insertion, or cutting of existing structural concrete shall be approved by a California registered structural consulting engineer prior to the execution of any construction. At all floor slabs and structural concrete walls to be drilled, cut or bolt anchors inserted, the contractor shall find and mark all reinforcing in both faces located by means of x-ray, pach-ometer, or prof-ometer. Submit sketch showing location of rebar and proposed cuts, cores, or bolt anchor locations for approval.

3.03 Field Test:

A. Test shall be in accordance with Acceptance testing specifications issued by the National Electrical Testing Association (NETA).

B. Perform equipment field tests and adjustments. Properly calibrate, adjust and operationally check all circuits and components, and demonstrate as ready for service. Make additional calibration and adjustments if it is determined later that the initial adjustments are not satisfactory for proper performance. Perform equipment field test for equipment where equipment field tests are specified in the equipment Specifications. Give sufficient notice to the Architect prior to any test so that the tests may be witnessed.

C. Provide instruments, other equipment and material required for the tests. These shall be of the type designed for the type of tests to be performed. Test instrument shall be calibrated by a recognized testing laboratory within three months prior to performing tests.

D. Operational Tests: Operationally test all circuits to demonstrate that the circuits and equipment have been properly installed and adjusted and are ready for full-time service. Demonstrate the proper functioning of circuits in all modes of operation, including alarm conditions.

E. Re-testing will be required for all unsatisfactory tests after the equipment or system has been repaired. Re-test all related equipment and systems if required by the Architect. Repair and re-test equipment and systems which have been satisfactorily tested but later fail, until satisfactory performance is obtained.

F. Maintain records of each test and submit five copies to the Architect when testing is complete. All tests shall be witnessed by the Architect. These records shall include:

1. Name of equipment tested.
2. Date of report.
3. Date of test.
4. Description of test setup.
5. Identification and rating of test equipment.
6. Test results and data.
7. Name of person performing test.
8. Owner or Architect's initials.

G. Items requiring testing shall be as noted in the additional electrical sections of these specifications.

3.04 Cleaning Equipment:

A. Thoroughly clean all soiled surfaces of installed equipment and materials.

3.05 Painting of Equipment:

A. Factory Applied: Electrical equipment shall have factory applied painting system which shall, as a minimum, meet the requirements of NEMA ICS 6 corrosion-resistance test and the additional requirements specified in the technical section.

B. Field Applied: Paint electrical equipment as required to match finish of adjacent surfaces.

3.06 Records:

A. Maintain one copy of the contract Drawing Sheets on the site of the work for recording the "as built" condition. After completion of the work, the Contractor shall carefully mark the work as actually constructed, revising, deleting and adding to the Drawing Sheets as required. The following requirements shall be complied with:

1. Cable Size and Type: Provide the size and type of each cable installed on project.

2. Substructure: Where the location of all underground conduits, pull boxes, stub ups and etc. where are found to be different than shown, carefully mark the correct location on the Drawings. Work shall be dimensioned from existing improvements.

3. Size of all conduit runs.

4. Routes of concealed conduit runs and conduit runs below grade.

5. Homerun points of all branch circuit.

6. Location of all switchgear, panels, MCC, lighting control panels, pullcans, etc.

7. Changes made as a result of all approved change orders, addendums, or field authorized revisions.

8. As Builts: At the completion of the Work the Contractor shall review, certify, correct and turn over the marked up Drawings to the Architect for his use in preparing "as built" plans.

9. As built Drawings shall be delivered to the Architect within ten (10) days of completion of construction.

3.07 Clean Up:

A. Upon completion of electrical work, remove all surplus materials, rubbish, and debris that accumulated during the construction work. Leave the entire area neat, clean, and acceptable to the Architect.

3.08 Mechanical and Plumbing Electrical Work:

A. The requirements for electrical power and/or devices for all mechanical and plumbing equipment supplied and/or installed under this Contract shall be coordinated and verified with the following:

1. Mechanical and Plumbing Drawings.
2. Mechanical and Plumbing sections of these Specifications.
3. Manufacturers of the Mechanical and Plumbing equipment supplied.

B. The coordination and verification shall include the voltage, ampacity, phase, location and type of disconnect, control, and connection required. Any changes that are required as a result of this coordination and verification shall be a part of this Contract.

C. The Electrical Contractor shall furnish and install the following for all mechanical and plumbing equipment:

1. Line voltage conduit and wiring.
2. Disconnect switches.
3. Manual line motor starters.

D. Automatic line voltage controls and magnetic starters shall be furnished by the Mechanical and/or Plumbing Contractor and installed and connected by the Electrical Contractor. When subcontracted for by the Mechanical and/or Plumbing Contractor, all line voltage control wiring installed by the Electrical Contractor shall be done per directions from the Mechanical and/or Plumbing Contractor.

E. All low voltage control wiring for Mechanical and Plumbing equipment shall be installed in conduit. Furnishing, installation and connection of all low voltage conduit, boxes, wiring and controls shall be by the Mechanical and/or Plumbing Contractor.

F. Disconnects (Motor And Circuit)

1. Disconnect switches shall be as manufactured by ITE- Siemens, General Electric or Square D.

G. Disconnects (Motor: Fused):

1. Disconnect switches shall be provided and located at all motors.
2. Switches for three-phase motors shall be heavy-duty, horsepower rated three-pole, and surface mounted except as noted on drawings.
3. Switches containing more than three poles shall be as specified on the drawings.
4. Switches for single-phase, fractional horsepower motors shall be heavy-duty, horsepower rated.

5. Switches shall be horsepower rated.

G. Manual motor starters, where required, shall have toggle type operators with pilot light and melting alloy type overload relays, SQUARE D COMPANY, Class 2510, Type FG-1P (surface) or Type FS-1P (flush) or ITE, WESTINGHOUSE or GENERAL ELECTRIC equal.

END OF SECTION

SECTION 16055

THROUGH-PENETRATION FIRESTOPPING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 Related Documents:

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Section, apply to work specified in this section.

1.2 Definitions:

A. Firestopping: The process of restoring an hourly fire endurance rating back to a fire barrier that lost its rating from an opening created in it.

1.3 General Description of the Work of This Section:

Only tested firestop systems shall be used in specific locations as follows:

A. Penetrations for the passage of cables, conduit, and other electrical equipment through fire-rated vertical barriers (walls and partitions), horizontal barriers (floor/ceiling assemblies), and vertical service shaft walls and partitions.

1.4 Related Work of Other Sections:

A. Coordinate work of this section with work of other sections as required to properly execute the work and as necessary to maintain satisfactory progress of the work of other sections, including (if available):

1. Section 03300 - Cast-In-Place Concrete
2. Section 04200 - Masonry Work
3. Section 07840 - Firestopping
4. Section 09250 - Gypsum Drywall Systems
5. Section 13080 - Sound, Vibration and Seismic Control
6. Section 13900 - Fire Suppression and Supervisory Systems
7. Section 16000 - General Electrical Requirements
8. Section 15300 - Fire Protection

1.5 References:

A. Test Requirements: ASTM E-814, "Standard Method of Fire Tests of Through Penetration Fire Stops" (July 1997).

B. Underwriters Laboratories (UL) of Northbrook, IL runs ASTM E-814 under their designation of UL 1479 and publishes the results in their "FIRE RESISTANCE DIRECTORY" that is updated annually.

1. UL Fire Resistance Directory:

a. Through-Penetration Firestop Devices (XHCR)
b. Fire Resistance Ratings (BXUV)
c. Through-Penetration Firestop Systems (XHEZ)
d. Fill, Voids, or Cavity Material (XHHW)
e. Forming Materials (XHKU)

C. International Firestop Council Guidelines for Evaluating Firestop Systems Engineering Judgments

D. ASTM E-84, Standard Test Method for Surface Burning Characteristics of Building Materials.

E. All major building codes: ICBO, SBCCI, BOCA, and IBC.
(Note to specifier: Retain or delete building codes listed above asapplicable)

F. NFPA 101 - Life Safety Code

1.6 Quality Assurance:

A. Firestop System installation must meet requirements of ASTM E-814, UL 1479 or UL 2079 tested assemblies that provide a fire rating equal to that of construction being penetrated.

B. Proposed firestop materials and methods shall conform to applicable governing codes having local jurisdiction.

C. Firestop Systems do not reestablish the structural integrity of load bearing partitions/assemblies, or support live loads and traffic. Installer shall consult the structural engineer prior to penetrating any load bearing assembly.

1.7 Project Conditions :

A. Do not use materials that contain flammable solvents.

B. Do not install penetration firestopping when ambient or substrate temperatures are outside limits permitted by penetration firestopping manufacturers or when substrates are wet because of rain, frost, condensation, or other causes.

C. Install and cure penetration firestopping per manufacturer's written instructions using natural means of ventilations or, where this is inadequate, forced-air circulation.

D. Scheduling

1. Schedule installation of CAST IN PLACE firestop devices after completion of floor formwork, metal form deck, or composite deck but before placement of concrete.

2. Schedule installation of other firestopping materials after completion of penetrating item installation but prior to covering or concealing of openings.

E. Verify existing conditions and substrates before starting work. Correct unsatisfactory conditions before proceeding.

F. During installation, provide masking and drop cloths to prevent firestopping materials from contaminating any adjacent surfaces.

PART 2 - PRODUCTS

2.1 Firestopping, General:

A. Provide firestopping composed of components that are compatible with each other, the substrates forming openings, and the items, if any, penetrating the firestopping under conditions of service and application, as demonstrated by the firestopping manufacturer based on testing and field experience.

B. Provide components for each firestopping system that are needed to install fill material. Use only components specified by the firestopping manufacturer and approved by the qualified testing agency for the designated fire-resistance-rated systems.

C. Fire rated pathway devices shall be the preferred product and shall be installed in all locations where frequent cable moves, add-ons and changes will occur.

2.2 Acceptable Manufacturers:

A. Subject to compliance with through penetration firestop systems (XHEZ) listed in Volume II of the UL Fire Resistance Directory, provide products of the following manufacturers as identified below:

1. Specified Technologies Inc., STI
   800-992-1180
2. Hilti, Inc., Tulsa, Oklahoma
   800-879-8000
3. Other manufacturers listed in the U.L. Fire Resistance Directory – Volume 2

2.3 Materials:

A. Use only firestop products that have been UL 1479, ASTM E-814 tested for specific fire-rated construction conditions conforming to construction assembly type,

penetrating item type, annular space requirements, and fire-rating involved for each separate instance.

B. Cast-in place firestop devices: Single component molded firestop device installed on forms prior to concrete placement with totally encapsulated, tamper-proof integral firestop system and smoke sealing gasket. Cast-in Place firestop devices are installed prior to concrete placement for use with non-combustible and combustible plastic pipe (closed and open piping systems), or electrical cable bundles, penetrating concrete floors, the following products are acceptable:

1. Specified Technologies, Inc. (STI) SpecSeal CD Cast-In Firestop Device
2. Hilti CP 680 Cast-In Place Firestop Device
3. Equivalent products listed in the U.L. Fire Resistance Directory – Volume 2

C. Latex Sealants: Single component latex formulations that upon cure do not re-emulsify during exposure to moisture. Latex Sealants for use with non-combustible items including rigid steel conduit and electrical metallic tubing (EMT), the following products are acceptable:

1. Specified Technologies, Inc. (STI) SpecSeal Series SSS Intumescent Sealant
2. Specified Technologies, Inc. (STI) SpecSeal Series LCI Intumescent Sealant
3. Specified Technologies, Inc. (STI) SpecSeal Series LC Endothermic Sealant
4. Hilti FS-ONE Intumescent Firestop Sealant
5. Equivalent products listed in the U.L. Fire Resistance Directory – Volume 2

D. Intumescent Latex sealants: Single component latex formulations that upon cure do not re-emulsify during exposure to moisture. Intumescent Latex Sealants or caulking materials for use with combustible items (penetrants consumed by high heat and flame) including PVC jacketed, flexible cable or cable bundles and plastic pipe, the following products are acceptable:

1. Specified Technologies, Inc. (STI) SpecSeal Series SSS Intumescent Sealant
2. Specified Technologies, Inc. (STI) SpecSeal Series LCI Intumescent Sealant
3. Hilti FS-ONE Intumescent Firestop Sealant
4. Equivalent products listed in the U.L. Fire Resistance Directory – Volume 2

E. Intumescent sealants, foams, caulking or putty materials for use with flexible cable or cable bundles, the following products are acceptable:

1. Specified Technologies, Inc. (STI) SpecSeal Series SSS Intumescent Sealant
2. Specified Technologies, Inc. (STI) SpecSeal Series LCI Intumescent Sealant
3. Specified Technologies, Inc. (STI) SpecSeal Series SSP Firestop Putty
4. Specified Technologies, Inc. (STI) Ready Firestop Grommet
5. Hilti FS-ONE Intumescent Firestop Sealant
6. Equivalent products listed in the U.L. Fire Resistance Directory – Volume 2

F. Non curing, re-penetrable intumescent sealants, caulking or putty materials for use with flexible cable or cable bundles, the following products are acceptable:

1. Specified Technologies, Inc. (STI) SpecSeal Series SSP Firestop Putty

2. Equivalent products listed in the U.L. Fire Resistance Directory – Volume 2

G. Wall opening protective materials: Intumescent, non-curing pads or inserts for protection of electrical switch and receptacle boxes to reduce horizontal separation to less than 24". Wall opening protective materials for use with U.L. listed metallic and specified nonmetallic outlet boxes, the following products are acceptable:

1. Specified Technologies, Inc. (STI) SpecSeal Series SSP Firestop Putty Pads
2. Specified Technologies, Inc. (STI) SpecSeal Series EP PowerShield Insert Pads
3. Equivalent products listed in the U.L. Fire Resistance Directory – Volume 1

H. Materials used for complex penetrations made to accommodate cable trays, multiple steel and copper pipes, electrical busways in raceways, the following products are acceptable:

1. Specified Technologies, Inc. (STI) SpecSeal Series SSM Firestop Mortar
2. Specified Technologies, Inc. (STI) SpecSeal Series SSB Firestop Pillows
3. Hilti FS 635 Trowelable Firestop Compound
4. Hilti FS 657 FIRE BLOCK
5. Hilti CP 620 Fire Foam
6. Equivalent products listed in the U.L. Fire Resistance Directory – Volume 2

I. Non curing, re-penetrable materials used for large size/complex penetrations made to accommodate cable trays, multiple steel and copper pipes, electrical busways in raceways, the following products are acceptable:

1. Specified Technologies, Inc. (STI) SpecSeal Series SSB Firestop Pillows
2. Hilti FS 657 FIRE BLOCK
3. Equivalent products listed in the U.L. Fire Resistance Directory – Volume 2

J. Fire Rated Cable Pathways: STI EZ-PATH™ Brand device modules comprised of steel raceway with intumescent foam pads allowing 0 to 100 percent cable fill, the following products are acceptable:

1. Specified Technologies Inc. (STI) EZ-PATH™ Fire Rated Pathway

K. Provide a firestop system with a "F" Rating as determined by UL 1479 or ASTM E814 which is equal to the time rating of construction being penetrated.

PART 3 - EXECUTION

3.1 Preparation:

A. Verification of Conditions: Examine areas and conditions under which work is to be performed and identify conditions detrimental to proper or timely completion.

1. Verify penetrations are properly sized and in suitable condition for application of materials.

2. Surfaces to which firestop materials will be applied shall be free of dirt, grease, oil, rust, laitance, release agents, water repellents, and any other substances that may affect proper adhesion.

3. Provide masking and temporary covering to prevent soiling of adjacent surfaces by firestopping materials.

4. Comply with manufacturer's recommendations for temperature and humidity conditions before, during and after installation of firestopping.

5. Do not proceed until unsatisfactory conditions have been corrected.

3.2 Coordination:

A. Coordinate location and proper selection of cast-in-place Firestop Devices with trade responsible for the work. Ensure device is installed before placement of concrete.

3.3 Installation:

A. Regulatory Requirements: Install firestop materials in accordance with UL Fire Resistance Directory.

B. Manufacturer's Instructions: Comply with manufacturer's instructions for installation of through-penetration materials.

1. Seal all holes or voids made by penetrations to ensure an air and water resistant seal.

2. Protect materials from damage on surfaces subjected to traffic.

3.4 Field Quality Control:

A. Examine sealed penetration areas to ensure proper installation before concealing or enclosing areas.

B. Keep areas of work accessible until inspection by applicable code authorities.

C. Perform under this section patching and repairing of firestopping caused by cutting or penetrating of existing firestop systems already installed by other trades.

3.5 Adjusting and Cleaning:

A. Remove equipment, materials and debris, leaving area in undamaged, clean condition.

B. Clean all surfaces adjacent to sealed holes and joints to be free of excess firestop materials and soiling as work progresses.

END OF SECTION

SECTION 16060

GROUNDING

PART 1 - GENERAL

1.1 Section Includes:

A. Conduits, wires, ground rods and other materials for the electrical grounding system.

1.2 Related Sections:

A. Section 16000 - Electrical General Requirements.

PART 2 - PRODUCTS

2.1 Ground Rod:

A. "Copperweld" ground rod conforming to or exceeding requirements of U.L. Specification No. 467 (ANSI C-33.8). Rod shall be 3/4" diameter and 10' in length, unless otherwise noted on the Drawings.

2.2 Below Grade Connections:

A. Compression fittings, Thomas & Betts, Series 52000, 53000 or 54000 or approved equal.

2.3 Hardware:

A. Bolts, nuts and washers shall be bronze, cadmium plated steel or other non-corrosive materials, approved for the purpose.

2.4 Waterproof Sealant:

A. Use Kearney "Aqua Seal" mastic sealant on all below grade clamp or compression type connections.

PART 3 - EXECUTION

3.1 Grounding and Bonding:

A. Grounding and bonding shall be as required by codes and local authorities.

B. All electrical equipment shall be grounded, including, but not limited to, panel boards, terminal cabinets and outlet boxes.

C. The ground pole of receptacles shall be connected to their outlet boxes by means of a copper ground wire connecting to a screw in the back of the box.

D. A green insulated copper ground wire, sized to comply with codes, shall be installed in all conduit runs.

E. All metal parts of pull boxes shall be grounded per code requirements.

F. All ground conductors shall be green insulated copper.

G. The ground system electrodes shall be tested for resistance before the equipment ground conductors are connected. Maximum ground system resistance shall be 25 ohms. Install up to two additional ground rods to meet the 25 ohm requirement. Multiple ground rods shall not be less than 10 feet apart.

H. Grounding of the panels [,] [and] buildings [and relocatables]. shall be completed as indicated on the Drawings.

END OF SECTION

SECTION 16110

CONDUITS, RACEWAYS AND FITTINGS

PART 1 - GENERAL

1.01 Description of Work:

A. The work of this section consists of furnishing and installing conduits, raceways and fittings as shown on the Drawings and as described herein.

1.02 Related Work:

A. See the following specification sections for work related to the work in this section:

1. 16112 Underground Ducts
2. 16113 In Grade Pull Boxes
3. 16120 Line Voltage Wire and Cable
4. 16130 Junction and Pull Boxes

PART 2 - PRODUCTS

2.01 Conduits, Raceways:

A. Electrical Metallic Tubing (EMT) shall be hot-dip galvanized after fabrication. Couplings shall be compression or set-screw type.

B. Flexible Conduit: Flexible metal conduit shall be galvanized steel.

C. Galvanized Rigid Steel Conduit (GRS) shall be hot-dip galvanized after fabrication. Couplings shall be threaded type.

D. Rigid Non-metallic Conduit: Rigid non-metallic conduit shall be PVC Schedule 40 (PVC-40 or NEMA Type EPC-40) conduit approved for underground use and for use with 90˚ C wires.

2.02 Conduit Supports:

A. Supports for individual conduits shall be galvanized malleable iron one-hole type with conduit back spacer.

B. Supports for multiple conduits shall be hot-dipped galvanized Unistrut or Superstrut channels, or approved equal. All associated hardware shall be hot-dip galvanized.

C. Supports for EMT conduits shall be galvanized pressed steel single hole straps.

D. Clamp fasteners shall be by wedge anchors. Shot in anchors shall not be allowed.

2.03 Fittings:

A. Provide threaded-type couplings and connectors for rigid steel conduits; provide steel compression (watertight), or steel set-screw type for EMT, (die-cast zinc or malleable iron type fittings are not allowed). Provide threaded couplings and Meyers hubs for rigid steel conduit exposed to weather.

B. Fittings for flexible conduit shall be Appleton, Chicago, IL, Type ST, O-Z Gedney Series 4Q by General Signal Corp., Terryville, CT, T & B 5300 series, or approved equal.

C. Fittings for use with rigid steel shall be galvanized steel or galvanized cast ferrous metal; access fittings shall have gasketed cast covers and be Crouse Hinds Condulets, Syracuse, NY, Appleton Unilets, Chicago, IL, or approved equal. Provide threaded-type couplings and connectors; set-screw type and compression-type are not acceptable.

D. Fittings for use with rigid non-metallic conduit shall be PVC and have solvent-weld-type conduit connections.

E. Union couplings for conduits shall be the Erickson type and shall be Appleton, Chicago, IL, Type EC, O-Z Gedney 3-piece Series 4 by General Signal Corp., Terryvile, CT, or approved equal. Threadless coupling shall not be used.

F. Bushings:

1. Bushings shall be the insulated type.

2. Bushings for rigid steel shall be insulated grounding type, O-Z Gedney Type HBLG, Appleton Type GIB, or approved equal.

G. Conduit Sealants:

1. Fire Retardant Types: Fire stop material shall be reusable, non-toxic, asbestos-free, expanding, putty type material with a 3-hour rating in accordance with UL Classification 35L4 or as specified on the Drawings.

PART 3 - EXECUTION

3.01 Conduit, Raceway and Fitting Installation:

A. For conduit runs exposed to weather provide rigid metal (GRS).

B. For conduit run underground, in concrete or masonry block wall and under concrete slabs, install minimum ¾" size nonmetallic (PVC) with PVC elbows. Where conduits transition from underground or under slab to above grade install wrapped rigid metal (GRS) elbows and risers.

C. For conduit runs concealed in steel or wood framed walls or in ceiling spaces or exposed in interior spaces above six feet over the finished floor, install EMT.

D. Flexible metal conduit shall be used only for the connection of recessed lighting fixtures and motor connections unless otherwise noted on the Drawings. Liquid-tight steel flexible conduit shall be used for motor connections.

E. The minimum size raceway shall be 1/2-inch unless indicated otherwise on the Drawings.

F. Installation shall comply with the CEC.

G. From pull point to pull point, the sum of the angles of all of the bends and offset shall not exceed 360 degrees.

H. Conduit Supports: Properly support all conduits as required by the NEC. Run all conduits concealed except where otherwise shown on the drawings.

1. Exposed Conduits: Support exposed conduits within three feet of any equipment or device and at intervals not exceeding NEC requirements; wherever possible, group conduits together and support on common supports. Support exposed conduits fastened to the surface of the concrete structure by one-hole clamps, or with channels. Use conduit spacers with one-hole clamps.

    a. Conduits attached to walls or columns shall be as unobtrusive as possible and shall avoid windows. Run all exposed conduits parallel or at right angles to building lines.

    b. Group exposed conduits together. Arrange such conduits uniformly and neatly.

2. Support all conduits within three feet of any junction box, coupling, bend or fixture.

3. Support conduit risers in shafts with Unistrut Superstrut, or approved equal, channels and straps.

I. Moisture Seals: Provide in accordance with NEC paragraphs 230-8 and 300-5(g).

J. Where PVC conduit transitions from underground to above grade, provide rigid steel 90’s with risers. Rigid steel shall be half-lap wrapped with 20 mil tape and extend minimum 12” above grade.

K. Provide a nylon pull cord in each empty raceway.

L. Provide galvanized rigid steel factory fittings for galvanized rigid steel conduit.

M. Slope all underground raceways to provide drainage; for example, slope conduit from equipment located inside a building to the pull box or manhole located outside the building.

N. Conduits shall be blown out and swabbed prior to pulling wires, or installation of pull cord in empty conduits.

END OF SECTION

SECTION 16112

UNDERGROUND DUCTS

PART 1 - GENERAL

1.01 Description of Work:

A. The work of this section consists of furnishing and installing raceways, and raceway spacers with necessary excavation.

1.02 Related Work:

A. See the following specification sections for work related to the work of this section.

1. 02200 Excavation and Backfill

2. 16110 Conduit Raceway and Fittings

1.03 Standards and Codes:

A. Work and material shall be in compliance with and according to the requirements of the latest revision of the following standards and codes.

1. National Electrical Code (NEC) (Latest Revision)

2. California Electrical Code (CEC).

3. Underground Installations CEC - Article 300.5

4. Rigid NonMetallic Conduit CEC - Article 347

PART 2 - PRODUCTS

2.01 Raceways:

A. As specified in Section 16110 Conduits, Raceways and Fittings.

PART 3 - EXECUTION

3.01 Excavation:

A. As specified in Section 02200, Excavation and Backfill and as required for the work shown on the Drawings.

3.02 Install raceways as indicated on drawings.

3.03 Sand Encasement:

A. As specified in Section 02200 - Excavation and Backfill.

3.04 Backfill:

A. As specified in Section 02200 - Excavation and Backfill.

END OF SECTION

SECTION 16113

IN GRADE PULL BOXES

PART 1 - GENERAL

1.01 Description of Work:

A. The work of this section consists of providing all labor, supervision, tools, materials, and performing all work necessary to furnish and install pre-cast concrete vaults, and pull boxes with necessary excavation.

1.02 Related Work:

A. See the following specification sections for work related to the work of this section.

1. 02200 Excavation and Backfill.

2. 16112 Underground Ducts.

1.03 Submittals:

A. As specified in Section 16000 and Division 1.

1. Catalog Data: Provide manufacturer's descriptive literature - Pre-cast Vaults, Pull Boxes and Accessories.

PART 2 - PRODUCTS

2.01 Materials and Equipment:

A. General Requirements:

1. Pull boxes for electrical power, controls and other communication circuits shall consist of pre-cast reinforced concrete boxes, extensions' bases, and covers as specified herein and as indicated on the Drawings. Pre-cast units shall be the product of a manufacturer regularly engaged in the manufacture of pre-cast vaults and pull boxes. Acceptable manufacturers are Christy, Utility Vault, Brooks, Associated Concrete or equal.

B. Construction:

1. Pre-cast concrete vaults and pull boxes for electrical power distribution and communication circuits with associated risers and tops shall conform to ASTM C478 and ACI 318. Pull boxes shall be the type noted on the Drawings and shall be constructed in accordance with the applicable details as shown. Tops and walls shall consist of reinforced concrete. Walls and bottom shall be of monolithic

concrete construction. Duct entrances and windows shall be located near the corners of structures to facilitate cable racking.

C. Covers:

1. The word "ELECTRICAL" shall be cast in the top face of all electrical cable boxes. The word “Signal” or “Fire Alarm” shall be cast in the top of the boxes utilized for these systems.

PART 3 - EXECUTION

3.01 Installation:

A. Install pull boxes where required to limit bends in conduit runs to not more than 360 degrees or where pulling tension achieved would exceed the maximum allowable for the cable to be installed. Note that these boxes are not shown on the Drawings.

B. Pre-cast pull boxes shall be installed approximately where indicated on the Drawings. The exact location of each pull box shall be determined after careful consideration has been given to the location of other utilities, grading, and paving. All cable boxes and secondary pull boxes shall be installed with a minimum of 6-inch thick crushed rock or sand bedding.

C. Paved areas - Vaults and pull boxes located in areas to be paved shall be installed such that the top of the cover shall be flush with the finished surface of the paving.

D. Unpaved Areas - In unpaved areas, the top of vaults and pull box covers shall be approximately 2 inches above finished grade.

E. Joint Seals - Section joints of pre-cast vaults and pull boxes shall be sealed with compound as recommended by the manufacturer.

F. Trenching, Backfilling, and Compaction - Trenching, backfilling and compaction shall be as specified in Section 02200 - Excavation and Backfill.

END OF SECTION

SECTION 16120

LINE VOLTAGE WIRE AND CABLE

PART 1 - GENERAL

1.01 Description of Work:

A. The work of this Section consists of providing all wire and cable rated 600 volts or less, including splices and terminations, as shown on the Drawings and as described herein.

1.02 Related Work:

A. See the following Specification Section for work related to the work in this Section:

1. 16110 Conduits, Raceways and Fittings.

2. 16130 Junction and Pull Boxes.

1.03 Quality Assurance

A. Field tests shall be performed as specified in paragraph 3.04 of this Section.

PART 2 - PRODUCTS

2.01 Conductors:

A. Conductors shall be copper, type THHN/THWN/MTW oil and gasoline resistant, 90°C, 600 volt rated insulation.

B. Conductors shall be stranded copper.

C. Minimum power and control wire size shall be No. 12 AWG unless otherwise noted.

D. All conductors used on this Project shall be of the same type and conductor material.

2.02 Cables:

A. All individual conductors shall be copper with type THHN/THWN, 90°C, 600 volt rated insulation.

D. Insulation Marking - All insulated conductors shall be identified with printing colored to contrast with the insulation color.

E. Color Coding - As specified in paragraph 3.03.

F. Special Wiring - Where special wiring is proposed by an equipment manufacturer, submit the special wiring requirements to the Owner's Representative and, if approved, provide same. Special wire shall be the type required by the equipment manufacturer.

G. Other Wiring - Wire or cable not specifically shown on the Drawings or specified, but required, shall be of the type and size required for the application and as approved by the Owner's Representative.

H. Manufacturer - Acceptable manufacturers including Cablec, Southwire, or equal.

2.03 Terminations:

A. Manufacturer - Terminals as manufactured by T&B, Burndy or equal.

B. Wire Terminations – Stranded conductors shall be terminated in clamping type terminations which serve to contain all the strands of the conductor. Curling of a stranded conductor around a screw type terminal is not allowed. For screw type terminations, use a fork type stake-on termination on the stranded conductor. Use only a stake-on tool approved for the fork terminals selected.

C. End Seals - Heat shrink plastic caps of proper size for the wire on which used.

2.04 Tape:

A. Tape used for terminations and cable marking shall be compatible with the insulation and jacket of the cable and shall be of plastic material.

PART 3 - EXECUTION

3.01 Cable Installation:

A. Clean Raceways - Clean all raceways prior to installation of cables as specified in Section 16110 - Conduits Raceway and Fittings.

B. All line voltage wiring shall be installed in conduit.

C. All feeder conductors shall be continuous from equipment to equipment. Splices in feeders are not permitted unless specifically noted or approved by the Electrical Engineer.

D. All branch circuit wiring shall be run concealed in ceiling spaces, walls, below floors or in crawl spaces unless noted otherwise.

E. Cable Pulling - Exercise care in pulling wires and cables into conduit or wireways so as to avoid kinking, putting undue stress on the cables or otherwise abrading them. No grease will be permitted in pulling cables. Only soapstone, talc, or UL listed pulling compound will be permitted. The raceway construction shall be complete and

protected from the weather before cable is pulled into it. Swab conduits before installing cables and exercise care in pulling, to avoid damage to conductors.

F. Bending Radius - Cable bending radius shall be per applicable code. Install feeder cables in one continuous length.

G. Equipment Grounding Conductors - Provide an equipment grounding conductor, whether or not it is shown on the Drawings, in all conduits or all raceways.

H. Panelboard Wiring - In panels, bundle incoming wire and cables which are No. 6 AWG and smaller, lace at intervals not greater than 6 inches, neatly spread into trees and connect to their respective terminals. Allow sufficient slack in cables for alterations in terminal connections. Perform lacing with plastic cable ties or linen lacing twine. Where plastic panel wiring duct is provided for cable runs, lacing is not necessary when the cable is properly installed in the duct.

3.02 Cable Terminations and Splices:

A. Splices - UL Listed wirenuts.

B. Terminations - Shall comply with the following:

1. Make up and form cable and orient terminals to minimize cable strain and stress on device being terminated on.

2. Burnish oxide from conductor prior to inserting in oxide breaking compound filled terminal.

3.03 Circuit and Conductor Identification:

A. Color Coding - Provide color coding for all circuit conductors. Insulation color shall be white for neutrals and green for grounding conductors. Conductor colors shall be as follows:

VOLTAGE	208/120V	480/277V
Phase A	Black	Brown
Phase B	Red	Orange
Phase C	Blue	Yellow
Neutral	White	Grey
Ground	Green	Green

B. Color coding shall be in the conductor insulation for all conductors #10 AWG and smaller; for larger conductors, color shall be either in the insulation or in colored plastic tape applied at every location where the conductor is readily accessible.

C. Circuit Identification - All underground distribution and service circuits shall be provided with plastic identification tags in each secondary box and at each termination. Tags shall identify the source transformer of the circuit and the building number(s) serviced by the circuit.

3.04 Field Tests:

A. All systems shall test free from short circuits and grounds, shall be free from mechanical and electrical defects, and shall show an insulation resistance between phase conductors and ground of not less than the requirements of the CEC. All circuits shall be tested for proper neutral connections.

B. Insulation Resistance Tests: Perform insulation resistance tests on circuits with #2 AWG and larger conductors to be energized with a line-to-neutral voltage of 120 volts or more. Make these tests before all equipment has been connected. Test the insulation with a 500Vdc insulation resistance tester with a scale reading 100 megohms. The insulation resistance shall be 2 megohms or more. Submit results for review.

END OF SECTION

SECTION 16130

OUTLET, JUNCTION AND PULL BOXES

PART 1 - GENERAL

1.01 Description of Work:

A. The work of this Section consists of providing all required labor, supervision, materials and equipment to satisfactorily complete all electrical installations shown on the drawings, included in these Specification, or otherwise needed for a complete and fully operating facility. The work shall include but not be limited to the following:
B. Furnish and install all required material, supports and miscellaneous material for the satisfactory interconnection of all associated electrical systems.

1.02 Related Work:

A. See the following specification sections for work related to the work of this section.

1. 260500 General Electrical Requirements.

2. 260542 Conduits, Raceway and Fittings.

3. 260519 Line Voltage Wire and Cable.

PART 2 - PRODUCTS

2.01 Outlet boxes, Junction and Pull boxes

A. Standard Outlet Boxes: Galvanized, steel, knock-out type of size and configuration best suited to the application indicated on the Drawings. Minimum box size shall be 4 inches square (octagon for most light fixtures) by 1-1/2 inches deep with mud rings as required.

B. Switch boxes: Minimum box size shall be 4 inches square by 1-1/2 inches deep with mud rings as required. Install multiple switches in standard gang boxes with raised device covers suitable for the application indicated.

C. Conduit bodies: Cadmium plated, cast iron alloy. Conduit bodies with threaded conduit hubs and neoprene gasketed, cast iron covers. Bodies shall be used to facilitate pulling of conductors or to make changes in conduit direction only. Splices are not permitted in conduit bodies. Crouse-Hinds Form 8 Condulets, Appleton Form 35 Unilets or equal.

D. Sheet Metal Boxes: Use standard outlet or concrete ring boxes wherever possible; otherwise use a minimum 16 gauge galvanized sheet metal, NEMA I box sized to Code requirements with covers secured by cadmium plated machine screws located six inches on centers. Circle AW Products, Hoffman Engineering Company or equal.

E. Flush Mounted Pull boxes and Junction boxes: Provide overlapping covers with flush head cover retaining screws, prime coated.

PART 3 - EXECUTION

3.01 Outlet Boxes

A. General:

1. All outlet boxes shall finish flush with building walls, ceilings and floors except in mechanical and electrical rooms above accessible ceiling or where exposed work is called for on the Drawings.

2. Install raised device covers (plaster rings) on all switch and receptacle outlet boxes installed in masonry or stud walls or in furred, suspended or exposed concrete ceilings. Covers shall be of a depth to suit the wall or ceiling finish.

3. Leave no unused openings in any box. Install close-up plugs as required to seal openings.

B. Box Layout:

1. Outlet boxes shall be installed at the locations and elevations shown on the drawings or specified herein. Make adjustments to locations as required by structural conditions and to suit coordination requirements of other trades.

2. Locate switch outlet boxes on the latch side of doorways.

3. Outlet boxes shall not be installed back to back nor shall through-wall boxes be permitted. Outlet boxes on opposite sides of a common wall shall be separated horizontally by at least one stud or vertical structural member.

4. For outlets mounted above counters, benches or backsplashes, coordinate location and mounting heights with built-in units. Adjust mounting height to agree with required location for equipment served.

5. On fire rated walls, the total face area of the outlet boxes shall not exceed 100 square inches per 100 square feet of wall area.

C. Supports:

1. Outlet Boxes installed in metal stud walls shall be equipped with brackets designed for attaching directly to the studs or shall be mounted on specified box supports.

2. Fixture outlet boxes installed in suspended ceiling of gypsum board or lath and plaster construction shall be mounted to 16 gauge metal channel bars attached to main ceiling runners.

3. Fixture outlet boxes installed in suspended ceilings supporting acoustical tiles or panels shall be supported directly from the structure above where pendant mounted lighting fixture are to be installed on the box.

4. Fixture Boxes above tile ceilings having exposed suspension systems shall be supported directly from the structure above.

5. Outlet and / or junction boxes shall not be supported by grid or fixture hanger wires at any locations.

3.02 Junction And Pull Boxes

A. General:

1. Install junction or pull boxes where required to limit bends in conduit runs to not more than 360 degrees or where pulling tension achieved would exceed the maximum allowable for the cable to be installed. Note that these boxes are not shown on the Drawings.

2. Locate pull boxes and junction boxes in concealed locations above accessible ceilings or exposed in electrical rooms, utility rooms or storage areas.

3. Install raised covers (plaster rings) on boxes in stud walls or in furred, suspended or exposed concrete ceilings. Covers shall be of a depth to suit the wall or ceiling finish.

4. Leave no unused openings in any box. Install close-up plugs as required to seal openings.

5. Identify circuit numbers and panel on cover of junction box with black marker pen.

B. Box Layouts:

1. Boxes above hung ceilings having concealed suspension systems shall be located adjacent to openings for removable recessed lighting fixtures.

C. Supports:

1. Boxes installed in metal stud walls shall be equipped with brackets designed for attaching directly to the studs or shall be mounted on specified box supports.

2. Boxes installed in suspended ceilings of gypsum board or lath and plaster construction shall be mounted to 16 gauge metal channel bars attached to main ceiling runners.

3. Boxes installed in suspended ceilings supporting acoustical tiles or panels shall be supported directly from the structure above.

4. Boxes mounted above suspended acoustical tile ceilings having exposed suspension systems shall be supported directly from the structure above.

END OF SECTION

SECTION 16140

DEVICES WIRING

PART 1 – GENERAL

1.01 Description of Work

A. The work of this section consists of:

1. Furnishing, installing, and connecting all duplex receptacles complete with wall plates and/or covers, as shown on the Drawings.

2. Furnishing, installing and connecting all light switches complete with wall plates and or handle operators, as shown on the Drawings.

1.02 Related Work:

A. See the following specification sections for work related to the work of this section:

1. 16110 Conduits, Raceways and Fittings.

2. 16120 Line Voltage Wire and Cable.

3. 16130 Junction and Pull Boxes.

1.03 Submittals: As specified in Section 16000 and Division 1.

A. Submit manufacturers published descriptive literature properly marked to identify the items to be supplied.

B. A single complete submittal is required for all products covered by this Section.

PART 2 – PRODUCTS

2.01 Receptacles:

A. General - Receptacles shall be heavy duty, high abuse, grounding type.

B. Duplex Receptacles:

1. Receptacles shall be specification grade, rated 20 ampere, two-pole, 3-wire, 125 volt, NEMA 5-20 configuration, self-grounding with screw terminals. Color shall be as selected by the Architect.

2. Devices shall have a nylon face, back and side wired.

3. Manufacturer: Hubbell #DR20 Series, Leviton #16352 Series.

C. GFCI Receptacles:

1. Device shall be rated 20 ampere, 2-pole, 3-wire, 120 volt, conforming to NEMA 5-20 configuration. Face shall be nylon composition. Unit shall have an LED type red indicator light, test and reset push buttons. Color shall be as selected by the Architect.

2. GFCI component shall meet UL 943 Class A standards with a tripping time of 1/40 second at 5 milliamperes current unbalance. Operating range shall extend from -31 °F to 158°F. Unit shall have transient voltage protection and shall be ceramic encapsulated for protection against moisture.

3. Manufacturer: Hubbell #GF20_ _LA Series, Leviton #GFNT2 Series.

D. Weather Resistant GFCI Receptacles:

1. Device shall be rated 20 ampere, 2-pole, 3-wire, 120 volt, conforming to NEMA 5-20 configuration, Face shall be nylon composition. Unit shall have a LED type red indicator light, test and reset push buttons. Color shall be as selected by the architect.

2. GFCI component shall meet UL 943 Class A standards with a tripping time of 1/40 second at 5 milliamperes current unbalance. Operating range shall extend from -31 °F to 158°F. Unit shall have transient voltage protection and shall be ceramic encapsulated for protection against moisture.

3. Manufacturer: Hubbell #GFTR20 _ _ Series, Leviton #GFWR2 Series.

E. Surge Suppression Receptacles:

1. Device shall be rated 20 ampere, 2-pole, 3-wire, 120 volt. Face shall be nylon composition. Unit shall have an LED type "Power-on" indication light and damage-alert audible alarm. Color shall be as selected by the Architect.

2. Surge suppression protection shall be listed to UL standard 1449 and shall instantly absorb a transient surge of 6,000 volts minimum. A minimum of four (4) Metal Oxide Varistors shall be utilized to absorb transients.

3. Manufacturer: Hubbell #HBL8362S Series, Leviton #8380 Series.

2.02 Switches:

A. Switches shall be rated 20 amperes to 120/277 volts ac. Units shall be flush mounted, self-grounding, quiet operating rocker devices. Rocker color shall be as selected by the Architect.

1. Manufacturer: Hubbell #DS_20_ _ Series, Leviton #5621 Series. See plans for single pole, three way and four way requirements.

B. Timed switches: Shall be as designed by Paragon Electric Company # ET2000f or Watt Stopper TS-400 rated for the voltage specified on drawings. Time-out shall be adjustable from 5 minutes up to 12 hours. Unit shall be provided with warning alarm.

C. Dimmer switches: Switch shall be a specified on drawings, color per architect. Heat fins shall not be removed, where dimmer switches are ganged together, care shall be taken to install correct size backbox to accommodate switches without removing fins.

2.03 Plates:

A. General - Plates shall be of the style and color to match the wiring devices, and of the required number of gangs. Plates shall conform with NEMA WD 1 , UL 514 and FS W-P-455A. Plates on finished walls shall be non-metallic or stainless steel. Plates on unfinished walls and on fittings shall be of zinc plated steel or case metal and shall have rounded corners and beveled edges.

B. Non-Metallic: Plates shall be plain with beveled edges and shall be nylon or reinforced fiberglass.

C. Stainless Steel: Plates shall be .040 inches thick with beveled edges and shall be manufactured from No. 430 alloy having a brushed or satin finish.

D. Cast Metal: Plates shall be cast or malleable iron covers with gaskets so as to be moisture resistant or weatherproof.

E. Blank Plates: Cover plates for future telephone outlets shall match adjacent device wall plates in appearance and construction.

F. Weatherproof Plate: Cover plates in wet and damp locations shall have recessed in-use covers, Taymac or equal. Back box shall be suitable for the wall material where it is installed.

G. Labeling: All switch and receptacle plates shall be labeled on the top portion of the plate with the panelboard and circuit number serving that device. Lettering shall be 3/16” minimum high, black color, on clear Mylar 3/8” tape. Manufactured by P-touch or equal.

PART 3 – EXECUTION

3.01 Installation of Wiring Devices:

A. Interior Locations: In finished walls, install each device in a flush mounted box with washers as required to bring the device mounting strap level with the surface of the finished wall. On unfinished walls, surface mount boxes level and plumb.

B. Mounting Heights: Adjust boxes so that the front edge of the box shall not be farther back from the finished wall plane than 1/4-inch. Adjust boxes so that they do not project beyond the finished wall. Height of device shall be as follows unless otherwise noted on the drawings:

1. Receptacles 15 Inches from finished floor to bottom of box.

2. Toggle Switches 48 Inches from finished floor to top of box.

C. Receptacles:

1. Ground each receptacle using a grounding conductor, not a yoke or screw contact.

2. Install receptacles with connections spliced to the branch circuit wiring in such a way that removal of the receptacle will not disrupt neutral continuity and branch circuit power will not be lost to other receptacles in the same circuit.

3.02 Installation of Wall Plates:

A. General - Plates shall match the style of the device and shall be plumb within 1/16-inch of the vertical or horizontal.

B. Interior Locations, Finished Walls: Install non-metallic plates so that all four edges are in continuous contact with the finished wall surfaces. Plaster filling will not be permitted. Do not use oversized plates or sectional plates.

C. Interior (not wet) Locations, Unfinished Walls: Install stainless steel or cast metal cover plates.

D. Wet Locations: Install cast metal plates with gaskets on wiring devices in such a manner as to provide a rain tight weatherproof installation. Cover shall be [lockable] outdoor “in use” type.

E. Future Locations: Install blanking cover plates on all unused outlets.

3.03 Tests:

A. Receptacles:

1. After installation of receptacles, energize circuits and test each receptacle to detect lack of ground continuity, reversed polarity, and open neutral condition.

END OF SECTION

SECTION 16470

PANELBOARDS AND DISTRIBUTION PANELS

PART 1 – GENERAL

1.01 Description of Work:

A. The work of this Section consists of providing panelboards and circuit breakers as shown on the Drawings and as described herein.

1.02 Related Work:

A. See the following specification sections for work related to the work in this Section.

1. 16120 Line Voltage Wire and Cable

2. 16060 Grounding

3. 16475 Circuit Breakers

1.03 Submittals:

A. Shop Drawings - As specified in Division 1 and Section 16000. For each panelboard and distribution panel furnished under this Contract, submit manufacturer's name, catalog data, and the following information:

1. Panelboard / distribution panel type.

2. Main bus and terminal connection sizes.

3. Location of line connections.

4. Cabinet dimension.

5. Gutter space.

6. Gauge of boxes and fronts.

7. Finish data.

8. Voltage rating.

9. Breaker manufacturer, types, trip rating, and interrupting ratings.

10. When information is available on the Drawings, show breaker circuit numbers and locations along with trip ratings on a panelboard layout.

B. Single Submittal - A single complete submittal is required for all products covered by this Section.

C. Closeout Submittals: Submit operation and maintenance data for panelboards and circuit breakers including nameplate data, parts lists, factory and field test reports, recommended maintenance procedures and typewritten as-built panel schedules. Submit in accordance with Division 1.

PART 2 – PRODUCTS

2.01 Panelboards:

A. General: Lighting and Receptacle Panelboards shall be the automatic circuit breaker type. The number and arrangement of circuits, trip ratings, spares and blank spaces for future circuit breakers shall be as shown on the Drawings or, if not shown, 42 circuits. All circuit breakers shall be quick-make, quick-break, thermal-magnetic, bolt-on type (unless otherwise noted on drawings), with 1, 2 or 3 poles a shown, each with a single operating handle. Tandem or piggy-back breakers shall not be used.

B. Nameplates:

1. Each panelboard shall have a field mounted identifying, rigid, plastic nameplate giving the panel identification as shown on the Drawings.

2. Each panelboard shall have a manufacturer's nameplate showing the voltage, bus rating, number of phases, frequency and number of wires.

C. Construction:

1. Door and trim shall be finished to match finish type and color of surrounding wall. Box shall be hot-dip galvanized, and field finished to match the front.

2. Panelboards and enclosures shall conform to requirements of all relevant codes. Panelboards shall be suitable for use as service equipment.

3. Panelboards shall be furnished with hinged trim fronts with key latch and a typed directory card and holder. Panelboard circuits shall be arranged with odd numbers on the left and even numbers on the right. Provide weatherproof, NEMA type 3R enclosures for outdoor installation.

D. Busbars: Panelboard busbars shall be phase sequence type suitable for bolt-on circuit breakers. All busbars shall be copper.

E. Circuit Breakers: Circuit breakers shall be the molded case type with trip and interrupting ratings as shown on the Drawings.

F. Manufacturer:

1. Panelboard manufacturer shall be Square D, Siemens, [I.E.M], [General Electric], [or] [Eaton Cutler Hammer]. Panelboards shall be of the same manufacturer as the switchboard.

2.02 Distribution Panels:

A. General: Distribution panels shall be the automatic circuit breaker type. The number and arrangement of circuits, trip ratings, spares and blank spaces for future circuit breakers shall be as shown on the Drawings. All circuit breakers shall be quick-make, quick-break, thermal-magnetic bolt-on type, with 1, 2 or 3 poles a shown, each with a single operating handle. Tandem or piggy-back breakers shall not be used.

B. Nameplates:

1. Each distribution panel shall have a field mounted, identifying, rigid, plastic nameplate giving the panel identification as shown on the Drawings.

2. Each distribution panel shall have a manufacturer's nameplate showing the voltage, bus rating, number of phases, frequency and number of wires.

C. Construction:

1. Door and trim shall be finished to match color of surrounding wall. Box shall be hot-dip galvanized, field finished to match the front.

2. Distribution panels and enclosures shall conform to requirements of all relevant codes. Distribution panels shall be suitable for use as service.

3. Distribution panels shall have a front door with key latch and a typed directory card and permanently attached holder. Adhesive backed holders are not acceptable. Distribution panels circuits shall be arranged with odd numbers on the left and even numbers on the right. Provide weatherproof, NEMA type 3R enclosures for outdoor installation.

D. Busbars: Distribution panels busbars shall be phase sequence type suitable for bolt-on circuit breakers. All busbars shall be copper, sized for a maximum current density of 1000A psi.

E. Circuit Breakers:

1. Circuit breakers shall be the molded case type with trip and interrupting ratings as shown on the Drawings.

2. Circuit breakers equipped with Ground-Fault Equipment Protection shall be capable of the following types of ground-fault protection: residual, source ground return, and modified differential.

   a. Ground-fault settings for circuit breaker sensor sizes 1200 A or below shall be adjustable from 0.2 to 1.0 times In in 0.1 In increments. The ground-fault settings for circuit breakers above 1200 A shall be adjustable from 500 to 1200 A.

3. Circuit breakers with an arc Energy-Reducing Maintenance Switch (ERMS) setting shall be equipped with a separate trip curve to reduce incident energy.

   a. The ERMS trip curve shall be selected through physical selector. Trip unit [remote indicator light] shall indicate when trip unit is operating in ERMS mode.

   b. Trip unit shall operate in Fast Instantaneous trip mode, 25 to 30 mS, when ERMS trip curve is active.

   c. Engaging/disengaging the ERMS mode or making settings changes to the ERMS settings shall be restricted to authorized personnel by limiting access to such features by padlocks or passwords to ensure safety of the personnel working with the equipment.

F. Manufacturer:

4. Distribution panel manufacturer shall be Square D, Siemens, [I.E.M], [General Electric], [or] [Eaton Cutler Hammer]. [Distribution panels shall be of the same manufacturer as the switchboard.]

PART 3 – EXECUTION

3.01 Installation: Panelboards and Distribution Panels shall be installed where indicated on the Drawings, and in accordance with the manufacturer's instructions.

3.02 Installation:

A. Panelboards and Distribution Panels shall be installed where indicated on the Drawings, and in accordance with the manufacturer's instructions.

B. Circuit breakers for solidly grounded Wye Electrical Systems of more than 150V to Ground and 1000A or larger shall be equipped with Ground-Fault Equipment Protection.

C. Circuit breakers 1200A and larger shall be equipped with a separate trip curve for an arc Energy-Reducing Maintenance Switch (ERMS) setting to reduce incident energy.

3.03 Mounting:

D. Panelboards and Distribution Panels shall be mounted with the top of the box 6'-6" above the floor. Panelboards and Distribution Panels shall be plumb within 1/8-inch. The highest breaker operating handle shall not be higher than 72 inches above the floor.

3.04 Field Tests:

A. Insulation Resistance Tests: Perform insulation resistance tests on circuits with #2 AWG and larger conductors to be energized with a line-to-neutral voltage of 120 volts or more. Make these tests after all equipment has been connected, except that equipment which may be damaged by the test voltage shall not be connected. Test the insulation with a 500Vdc insulation resistance tester with a scale reading 100 megohms. The insulation resistance shall be 2 megohms or more. Submit results for review.

B. Grounding: Grounding shall conform to Section 16060.

C. Continuity: Panelboard and Distribution Panel circuits shall be tested for continuity prior to energizing. Continuity tests shall be conducted using a dc device with a bell or buzzer.

END OF SECTION

SECTION 16475

CIRCUIT BREAKERS

PART 1 - GENERAL

1.01 Description of Work:

A. The work of this Section consists of providing circuit breakers as shown on the Drawings and as described herein.

1.02 Related Work: See the following Specification Sections for work related to the work in this Section.

A. 16000 General Electrical Requirements

B. 16425 Switchboards

C. 16470 Panelboards and Distribution Panels

1.03 Submittals:

A. Shop Drawings - Submittals shall be in accordance with Section 16000 and Division 1. For each circuit breaker furnished under this Contract, submit manufacturer's name, catalog data, and the following information:

1. Terminal connection sizes.

2. Voltage rating.

3. Breaker manufacturer, types, trip ratings and interrupting ratings.

B. Single Submittal - A single complete submittal is required for all products covered by this Section.

C. Closeout Submittals: Submit in accordance with and Section 16000, operation and maintenance data for circuit breakers including nameplate data, parts lists, manufacturer's circuit breaker timer, current, coordination curves, factory and field test reports and recommended maintenance procedures.

PART 2 - PRODUCTS

2.01 Circuit Breaker: Each circuit breaker shall consist of the following:

A. A molded case breaker with an over center toggle-type mechanism, providing quick-make, quick-break action. Each circuit breaker shall have a permanent trip unit containing individual thermal and magnetic trip elements in each pole. Multipole circuit breakers shall have variable magnetic trip elements which are set by a single adjustment

to assure uniform tripping characteristics in each pole. Circuit breakers shall be of the bolt-on type unless otherwise noted.

B. Breaker shall be calibrated for operation in an ambient temperature of 40°C.

C. Each circuit breaker shall have trip indication by handle position and shall be trip-free.

D. Three pole breakers shall be common trip.

E. The circuit breakers shall be constructed to accommodate the supply connection at either end of the circuit breaker. Circuit breaker shall be suitable for mounting and operation in any position.

F. Breakers shall be rated as shown on Drawings.

G. Circuit breaker and/or Fuse/circuit breaker combinations for series connected interrupting ratings shall be listed by UL as recognized component combinations for use in the end use equipment in which it is installed. Any series rated combination used shall be marked on the end use equipment per CEC section 110-22.

H. Breakers shall be UL listed. Circuit breakers shall have removable lugs.

I. Lugs shall be UL listed for copper and aluminum conductors.

J. Breakers shall be UL listed for installation of mechanical screw type lugs.

K. Circuit breakers serving HACR rated loads shall be HACR type. Circuit breakers serving other motor loads shall be motor rated.

PART 3 - EXECUTION

3.01 Mounting:

A. The highest breaker operating handle shall not be higher than 72 inches above the floor.

END OF SECTION

SECTION 16500

LIGHTING

PART 1 – GENERAL

1.01 Description of Work:

A. The work of this section consists of providing and installing a complete lighting system, including fixtures, LED light module, hangers, reflectors, glassware, lenses, auxiliary equipment, heat management components, LED driver (integral or remote), and housing.

1.02 Related Work:

A. See the following specification sections for work related to the work of this section:

1. 16000 General Electrical Requirements.

2. 16110 Conduit, Raceway and Fittings.

3. 16120 Line Voltage Wire and Cable.

4. 16130 Junction and Pull Boxes.

1.03 Submittals: In accordance with Division 1.

A. Submit descriptive data, photometric curves for each fixture configuration proposed.

B. Submit shop drawings showing proposed methods for mounting lighting fixtures.

C. Seismic Requirements: Submit:

1. Sketch or description of the anchorage system if not provided on construction documents.

D. Submit Operation and Maintenance Data per Division 1.

1.04 Warranty:

A. LED light module, LED driver, , batteries or other luminaire components which fail within the first year after final acceptance shall be replaced by the Contractor with the warranty clause of the General Provisions.

B. Replacement components provided under warranty to be provided by contractor, not taken from project spare stock.

PART 2 – PRODUCTS

2.1 General

A. Fixtures shall be of the types, wattages and voltages shown on the Drawings and be UL or equivalent classified and labeled for the intended use.

B. Substitutions will not be considered unless the photometric distribution curve indicates the proposed fixture is equal to or exceeds the specified luminaire and the substitution is consistent with the design intent.

C. Luminaire (factory or field installed) wire, and the current carrying capacity thereof shall be in accordance with the CEC.

D. Luminaires and lighting equipment shall be delivered to the project site complete, with suspension accessories, aircraft cable, stems, hangers canopies, hickeys, castings, sockets, holders, LED light engine, [lamps], [ballasts], diffusers, frames, and related items, including support and braces.

2.2 Light Emitting Diode (LED) Light Sources and Luminaires:

A. General (Non-Emergency):

1. Provide identical power supply and driver within each luminaire type. Provide power supplies and drivers that are suitable and UL-listed for the electrical characteristics of the supply circuits to which they are to be connected and which are suitable for operating LED or relevant light sources.
2. Unless otherwise specified, provide power supplies of same type and same manufacturer for ease of stocking and replacement.
3. Components shall be configured and installed in luminaire by the luminaire manufacturer.
4. Luminaire housing shall be constructed of painted metal with no sharp edges unless otherwise noted.
5. Provide only luminaires whose design, fabrication and assembly prevent overheating or cycling of light engines or drivers/power supplies under any condition of use.
6. Electronic ballasts shall meet the requirements of the Federal Communications Commission Rules and Regulations, Part 18, Part C (RF Lighting Devices) Non-consumer equipment, regarding radio frequency interference (RFI) (radiated) and electromagnetic interference (EMI) (power line conducted).

7. Submit light fixture details with luminaire shop drawings.

B. Emergency Lighting: Battery-backed emergency lighting luminaires shall consist of a normal LED luminaire with some or all of the LEDs connected to a battery and charger.

1. The battery shall be nickel cadmium and sized for a minimum of 90 minutes of luminaire operation unless otherwise noted.
2. The charger shall be solid-state and include overload, short circuit, brownout and low battery voltage protection.
3. The battery and charger shall include self-diagnostic and self-exercising circuitry to exercise and test itself for 5 minutes every month and for 30 minutes every 6 months.
4. The luminaire shall include a test/monitor module with status indicating lights mounted so as to be visible to the public.
5. The luminaire shall not contain an audible alarm.
6. Test for Emergency Lighting: Interrupt power supply to demonstrate proper operation. Verify transfer from normal power to battery power and retransfer to normal.

C: LED Performance and component manufacturer requirements.

1. All color characteristics, SPD (Special Power Distribution) CCT, CRI, CIE Chromaticity Coordinates shall be consistent across the entire dimming range.

2. LEDs shall comply with ANSI/NEMA/ANSLG C78.377-2008 – Specifications for the Chromaticity of Solid State Lighting Products. Color shall remain stable throughout the life of the source. The chromaticity of the installed product shall match IES LM-80 data showing that the LED’s do not shift more than .005 DuV from submitted documentation.

3. White LEDs shall have a minimum rated source life of 50,000 hours or as specified: Luminaire Schedule. Multicolor LEDs shall have a minimum rated source life of 100,000 hours. LED “rated source life” shall be determined per IES TM-21 - Projecting Long Term Lumen Maintenance of LED Light Sources based on LM-80 test data. Calculated lifetimes exceeding testing hours per TM-21 are not accepted.

4. Luminaire assembly shall include a method of dissipating heat so as to not degrade life of source, electronic equipment, or lenses. LED luminaire housing shall be designed to transfer heat from the LED board to the outside environment. Luminaire housing shall have no negative impact on life of components. Manufacturer shall provide Luminaire Efficacy (lm/W), total luminous flux (lumens), luminous intensity (candelas), chromaticity coordinates, CCT, CRI, optical performance, polar diagrams, and relevant luminance and illuminance

photometric data. Provide data in IES file format in accordance with testing standards IES LM-79-08 and IES LM-82-12, based on test results from an independent Nationally Recognized Testing Laboratory or National Voluntary Laboratory Accreditation Program (NVLAP) accredited laboratory.

5. Manufacturer will keep record of original chromaticity coordinates for each LED module and have replacement modules or luminaires from within three (3) MacAdamEllipses/ steps of the same coordinates available for the duration of the warranty period.

6. Manufacturer's LED light engine or equivalent system will be available for ten (10) years: Manufacturer will provide exact replacement parts, complete replacement luminaires, or provide upgraded parts that are designed to fit into the original luminaire and provide equivalent distribution and lumen output to the original, without any negative consequences.

7. All LED sources used in the LED luminaire shall be of proven quality from established and reputable LED manufacturers and shall have been fabricated within 12 months before installation per the date code on the module. Acceptable LED component or module manufacturers unless otherwise noted are:

    a. Cree, Inc.

    b. Lumileds

    c. Nichia Corporation

    d. Norlux

    e. Lextar

    f. Osram Optronic Semiconductors

    g. Xicato

    h. Bridgelux

    i. Epistar

    j. San'an

    k. Citizen Electronics

    l. General Electric Company

    m. Soraa

    n. Samsung

    o. Seoul Semiconductor

p. Lumenetix

q. Ledengin

2.3 LED Power Supplies/ Drivers:

1. LED driver shall have a minimum 50,000 hour published life while operating at maximum case temperature and 90 percent non-condensing relative humidity.
2. Driver shall be Sound Rated A+.
3. Driver shall be > 80% efficient at full load across all input voltages.
4. Driver shall include ability to turn off at low control input rather than holding at a minimum dimming level, and shall consume 0.5 Watts or less in standby/off mode. Control deadband at low control intput shall be included to allow for voltage variation of incoming signal without causing noticeable variation in luminaire to luminaire output.
5. Drivers shall track evenly across multiple luminaires at all light levels, and shall have an input signal to output light level that allows smooth adjustment over the entire dimming range.
6. Control Input:
   a. 4-Wire (0-10V DC Voltage Controlled) Dimming Drivers
      (i) Must meet IEC 60929 Annex E for General White Lighting LED drivers.
      (ii) Connect to devices compatible with 0 to 10V Analog Control Protocol, Class 2, capable of sinking 0.6 ma per driver at a low end of 0.3V.
      (iii) Must meet ESTA E1.3 for RGBW LED drivers.
   b. Digital (DALI Low Voltage Controlled) Dimming Drivers
      (i) Must meet IEC 62386.
   c. Digital Multiplex (DMX Love Voltage Controlled) Dimming Drivers
      (i) Must meet DMX / RDM: USITT DMX512A and ANSI E1.20 (Explore & Address).
      (ii) Must be capable of signal interpolation and smoothing of color and intensity transitions.
7. Power Factor: The luminaire shall have a power factor of 90% or greater at all standard operating voltages and full luminaire output.

8. THD: Total harmonic distortion (current and voltage) induced into an AC power line by luminaire shall not exceed 10 percent at any standard input voltage and meet ANSI C82.11 maximum allowable THD requirements at full output. THD shall at no point in the dimming curve allow imbalance current to exceed full output THD.
9. In Rush Current: Meet or exceed NEMA 410 driver inrush standard of 430 Amps per 10 Amps load with a maximum of 370 Amps 2 – seconds.
10. RF Interference: The luminaire and associated on-board circuitry must meet Class A emissions limits referred in Federal Communications Commission (FCC) Title 47, Subpart B, Section 15 Non-Consumer requirements for EMI/RFI emissions.
11. Light engines shall be 3500] 90 CRI minimum, U.O.N. on drawings.
12. Drivers shall be accessible for maintenance or replacement without removal of recessed light fixture and without destruction of the ceiling.

PART 3 – EXECUTION

3.01 Installation:

A. General:

1. All fixtures and luminaires shall be clean and lamps shall be operable at the time of acceptance.

2. Install luminaires in accordance with manufacturer's instructions, complete with lamps, ready for operation as indicated.

3. Align, mount, and level the luminaires uniformly.

4. Avoid interference with and provide clearance for equipment. Where an indicated position conflicts with equipment locations, change the location of the luminaire by the minimum distance necessary.

5. Recessed light fixtures in fire rated assemblies shall be installed per an approved UL rated fire rated pentation detail.

B. Mounting and Supports:

1. Mounting heights shall be as shown on the Architectural and Electrical Drawings. Unless otherwise shown, mounting height shall be measured to the centerline of the

outlet box for wall mounted fixtures and to the bottom of the fixture for suspended fixtures and to the bottom of the fixture for all other types.

2. Luminaire supports shall be anchored to structural members.

3. Pendant stem mounted luminaires shall be provided with ball aligners to assure a plumb installation and shall have a minimum 45 degree clean swing from horizontal in all directions. Sway bracing shall be installed as required to limit the movement of the fixture. Fixtures shall be allowed to sway a maximum of 45º without striking any object.

4. Fixture supports shall be designed to resist earthquake forces of seismic zone 4.

5. Refer to fixture mounting details on drawings for installation requirements.

6. Pendant cable mounted luminaries shall be provided with fully adjustable stainless steel aircraft cable hangers unless otherwise noted on the Drawings.

END OF SECTION

SECTION 16725

FIRE ALARM SYSTEM

PART 1 - GENERAL

1.01 Description of Work:

A. Furnish and install all materials and equipment including all required equipment, panels, raceways, conductors and connections. Provide all labor required and necessary to complete the work shown on the drawings and/or specified in all Sections of Division 16 and all other work and miscellaneous items, not specifically mentioned, but reasonably inferred for the extension of the existing addressable fire alarm system installation including all accessories and appurtenances required for testing the systems. It is in the intent of the drawings and specifications that all systems will be complete, and ready for operation. No extra charge will be paid for furnishing items required by regulations, but not specified herein, or on drawings.

B. The contractor scope of work shall not degrade any function or operation of the remaining site fire alarm system.

1.02 Related work:

A. Division 0 General Conditions, Division 1 General Requirements.

B. See the following specification sections for work related to the work in this section.

1. All other sections of Division 16.

1.03 Codes and Standards:

A. Devices and equipment for fire alarm systems shall be U.L. listed.

B. UL 864 Control Units, Fire Protective Signaling Systems.

C. Devices and equipment for fire alarm system shall be listed by the California State Fire Marshal for the specific purpose the device or equipment is used.

D. Work and material shall be in compliance with and according to the requirements of the latest version of the following standards and codes:

1. California Fire Code (CFC) based on the International Fire Code (IFC) with California Amendments.

2. California Building Code (CBC) based on the International Building Code (IBC) with California Amendments.

3. California Electric Code (CEC) based on the National Electric Code (NEC) and California Amendments.

4. California Mechanical Code (CMC) based on the Uniform Mechanical Code (UMC) and California Amendments.

5. California Plumbing Code (CPC) based on the Uniform Plumbing Code (UPC) and California Amendments.

6. Title 19 C.C.R., Public Safety, State Fire Marshals Regulations.

7. NFPA 72, National Fire Alarm and Signaling Code.

1.04 Submittals:

A. In accordance with Division 16.

B. Submit the following items:

1. Manufacturer’s Catalog Data: Manufacturer’s original catalog cuts and original description of data of all material and equipment with sufficient information provided so that the exact function of each device is known. Each item supplied shall be clearly identified including both U.L. number and a copy of the State Fire Marshal’s listing.

C. Description of conductors to be used with a statement that all wire shall be in conduit. Where accessible ceiling occurs, plenum rated wire on J-hooks are acceptable.

1.05 Quality Assurance:

A. Installer: The installation firm shall be an established communications and electronics contractor with at least 10 years successful installation experience of products utilizing integrated communications systems and equipment specific to that required for this project. The firm shall currently maintain and locally run and operated business. Only California Certified fire alarm technicians or California Certified electrician shall be used to install the fire alarm system. Provide proof to district that all employees are California Certified to install the fire alarm system.

B. All materials, unless otherwise specified, shall be new, and free from any defects. All items of equipment including wire and cable shall be designed by the manufacturer unless otherwise specified, shall function as a complete system and shall be accompanied by the manufacturer's complete service notes and drawings detailing all interconnections.

C. The Contractor shall show satisfactory evidence, upon request, that he maintains a fully equipped service organization capable of furnishing adequate inspection and service to the system. The contractor shall maintain at his facility the necessary spare parts in the proper proportion as recommended by the manufacturer to maintain and service the equipment being supplied.

1.06 Warranties:

A. The contractor shall warrant all equipment and wiring free from inherent mechanical and electrical defect for one year (365 days) from the date of final acceptance. The contractor shall without additional expense to the owner, replace any defective materials or equipment provided by him under this contract within the warranty period.

PART 2 – PRODUCTS

2.01 Fire Alarm Control Panel:

A. The FACP is existing to remain.

2.02 Detection Devices:

A. Manual Pull Stations:

1. Provide non coded, addressable, semi-recessed, double-action type manual pull station with mechanical reset features. Where installed in existing buildings, boxes may be surface-mounted. Surface mounted boxes shall be the same color as the pull stations.

2. Provide separate screw terminal for each conductor connected to the manual alarm pull station. Break-glass-front pull stations will not be permitted. Provide red aluminum, housing labeled “fire”. The pull stations shall not be resettable without the use of a key. [Provide Stopper II Guards for all manual stations in public areas].

B. Detectors:

1. Each photoelectric smoke detector and heat detector shall be interchangeable via twist-lock mounting base, to ensure matching the proper sensor to the potential hazards of the areas being protected. The system shall recognize when an improper sensor type has been installed in a previously programmed sensor type location.

C. Photoelectric Smoke Detector:

1. Provide white flame retardant plastic, addressable, analog, photoelectric type, smoke detectors. Detectors shall operate using an optical sensing chamber principal which complies with UL 268.

2. Each detector shall be capable of being set at two sensitivity settings.

3. Each detector shall have two LED visual indicators providing local 360 degree visibility of operating status and alarm indication.

4. Each detector shall be supported independently of wiring connections, and connected by separate screw terminals of each conductor.

5. The detector screen and cover assembly must be easily removable for field cleaning.

D. Combination Fixed Temperature, rate of Rise Heat Detectors:

1. Provide off-white flame retardant plastic, addressable, combination 140 degree F fixed temperature, rate of rise heat dual thermistor detectors. Detector shall initiate an alarm when temperature rises at a rate of over 15 degrees F per minute or above 140 degrees F.

2. Each detector shall have two LED visual indicators providing local 360 degree visibility of operating status and alarm indication.

3. Contacts shall be self-resetting after response to rate or rise principal. Locate detectors in accordance with UL FPD or FM P7825 listing and the requirements of NFPA 72. Temperature rating of detectors shall be in accordance with NFPA 72.

E. Addressable Monitor Module: provide addressable monitor module wired as style B (class "B") to provide an address for normally open contact devices.

1. Provide Addressable Monitor Module to monitor status of all Water flow Switches, Valve tamper Switches and Post Indicator Valves.

2.03 Alarm Notification Devices:

A. Color of notification appliances shall be red, unless otherwise noted by District.

B. All alarm notification devices shall be synchronized throughout the school campus.

C. Strobe Lights: Provide recessed mounted strobe light assembly suitable for use in electrically supervised circuit. Lamps shall be xenon flashtube type, powered from the fire alarm control panel alarm signaling circuit. Strobes shall provide candela ratings as indicated on the drawings candelas and flash 60 times per minute unless otherwise noted. Strobes in toilets shall provide a minimum of 15 candelas. Lamps shall be protected be a clear polycarbonate lens. Housing shall be labeled "FIRE" in red vertical lettering.

D. Horns/Strobes: Provide recessed mounted, grille face, vibrating diaphragm type, audio alarm devices consisting of an electro-mechanical horn suitable for use in an electrically supervised circuit. Horn/Strobes shall be provided with a red, tamper resistant grill. Horn shall have a minimum sound rating of 90 DBA at 10 feet and have field selectable sound levels. Horns shall be capable of providing a synchronized, field

selectable, temporal code 3 tone. Horns shall have a separate minimum candela as shown on the drawings and flash 60 times per minute unless otherwise noted. Lamps shall be protected by a clear polycarbonate lens. Housing shall be labeled “FIRE” in red vertical lettering.

E. Horns: Provide recessed mounted, grille face, vibrating diaphragm type, audio alarm devices consisting of an electro-mechanical horn suitable for use in an electrically supervised circuit. Horns shall be provided with a red, tamper resistant grill. Horn shall have a minimum sound rating of 90 DBA at 10 feet and have field selectable sound levels. Horns shall be capable of providing a synchronized, field selectable, temporal code 3 tone. Horns shall have a separate screw terminal for each conductor connection.

F. Exterior Horns: Provide recessed mounted, grille face, vibrating diaphragm type, audio alarm devices consisting of an electro-mechanical horn suitable for use in an electrically supervised circuit. Horns shall be provided with a red, tamper resistant grill, and a weatherproof backbox. Horn shall have a minimum sound rating of 90 DBA at 10 feet and have field selectable sound levels. Horns shall be capable of providing a synchronized, field selectable, temporal code 3 tone. Horns shall have a separate screw terminal for each conductor connection. Horns located in areas subject to moisture or exterior atmospheric conditions, shall be approved for such locations.

G. Field Charging Power Supply (FCPS):

1. The FCPS is a device designed for use as either a remote 24 volt power supply or used to power Notification Appliances.

2. The FCPS shall offer up to 6.0 amps (4.0 amps continuous) of regulated 24 volt power. It shall include an integral charger designed to charge 7.0 amp hour batteries and to support 60 hour standby.

3. The Field Charging Power Supply shall have two input triggers. The input trigger shall be a Notification Appliance Circuit (from the fire alarm control panel) or a relay. Four outputs (two Style Y or Z and two style Y) shall be available for connection to the Notification devices.

4. The FCPS shall include an attractive surface mount backbox.

5. The Field Charging Power Supply shall include the ability to delay the AC fail delay per NFPA requirements.

6. The FCPS include power limited circuitry, per 1995 UL standards.

2.04 Wiring and Conduit:

A. Provide wiring in accordance with NFPA 72.

B. Conductors shall be solid copper. Conductors for 120 volt circuits shall be No. 12 AWG minimum; conductors for low-voltage DC circuits shall be No. 14 AWG minimum for annunciation circuits and No. 14 AWG minimum for initiation circuits. All cables shall be rated and code compliant for their use.

1. All low voltage wiring not installed in conduits shall be plenum rated.

2. Provide color-coded conductors. Identify conductors by plastic-coated, self-sticking, printed markers or by heat-shrink type sleeves. Each conductor used for the same specific function shall be distinctly color coded. Use different color codes for each interior circuit. Each circuit color code wire shall remain uniform throughout the circuit.

3. Pigtail or “T” tap connections to the evacuation alarm horns, horn/strobes and strobes are not acceptable.

4. Underground circuit or circuits in wet areas shall be gel filled cables in scheduled 40 PVC conduit. There shall be no splicing of any underground cables.

C. Conduits:

1. Identification of Conduit: New conduits containing fire alarm system conductors shall be red, ¾” minimum. Junction-boxes, covers, gutters, and terminal cabinets, containing fire alarm system conductors, shall be painted red or provided red in color with engraved plastic identification signs permanently attached to the equipment.

2. Do not run fire alarm circuits in the same conduit with the non-fire alarm circuits.

3. Do not run AC circuits in the same conduit with the fire alarm circuits.

4. Provide wiring in rigid metal conduit for exterior installations or where exposed to damage.

5. Conceal conduit in finished areas of new construction and wherever practical in existing construction. Conduit runs shall be straight, neatly arranged properly supported and parallel or perpendicular to walls and partitions. Identify conductors within each enclosure where a tap, splice, or termination is made.

PART 3 - EXECUTION

3.01 Installation:

A. Equipment, materials, installation, workmanship, inspection, and testing shall be in accordance with the NFPA publications and as modified herein.

B. Follow manufacturer's directions in all cases for installation, testing and energizing.

C. Accurately set, level, support, and fasten all equipment.

D. Smoke and heat detectors:

1. No detector shall be located closer than 12 inches to any part of any lighting fixture. Detectors, located in areas subject to moisture or exterior atmospheric conditions, or hazardous locations as defined by NFPA 70, shall be approves for such locations.

E. Conduit where exposed shall be installed parallel with the walls or structural elements; vertical runs to be plumb; horizontal runs to be level or parallel with structure; conduit grouped neatly together with straight runs, all bends parallel and uniformly spaced.

F. Earthquake Resistant installation/fastening of all electrical equipment shall conform to the general requirements of section 1614A of the California Building Code.

3.02 Preliminary Tests:

A. Conduct the following tests during installation of wiring and system components. Correct deficiency pertaining to these requirements prior to formal functional and

operational tests of the system, preliminary tests shall be performed in the presence of the Local Fire Authority and Project inspector of Record to determine the conformance with the specified requirements.

B. Ground Resistance: Measure the resistance of each connection to ground. Ground resistance shall not exceed 10 ohms.

C. Dielectric Strength insulation Resistance: Test the dielectric strength and the Insulating resistance of the system interconnecting wiring by means of an instrument capable of generating 500 volts of DC and equipped to indicate leakage current 1000 megohms. For the purpose of this test, connect the instrument between each conductor on the line and between each conductor and ground at the control panel end of the line, with the other extremity open circuited and all series-connected devices in place. The system shall withstand the test without breakdown and shall indicate a resistance of not less than 1.0 minute with a DC potential of not less than 100 volts and not more than 500 volts.

D. Standby Battery Test: prior to formal inspection and tests, place the fire alarm system on standby battery power for 24 [60] hours; immediately thereafter, sound the building evacuation alarm signaling devices for 5 minutes. When the test is complete, the fire alarm system battery charger shall be fully recharged within 24 hours.

E. Field Inspection and Test:

1. Before final acceptance of the work, pre-test system to demonstrate compliance with the contract requirements. System shall be subjected to complete functional and operational tests, including tests in place of each detector. When tests have been completed and corrections made, submit a signed and dated NFPA Certificate of Completion along with a completed testing matrix with the request for formal inspection and tests.

2. Where application of heat would destroy a heat detector, it may be manually activated.

3. Verify the proper receipt of the alarm signals at the central station for the UDACT provide printout of test reports. It shall be the sole obligation of the contractor to coordinate and to provide all testing documentation from the central station.

4. The communication loops and the indicating appliance circuits shall be opened in at least two locations per zone to check for the presence of correct supervisory circuitry.

5. Perform the field inspection and test in the presence of the manufacturer's representative, the owner's representative, local Fire Authority and Project Inspector of Record (IOR).

6. Test equipment: It shall be the responsibility of the installing Contractor to furnish tools, instruments, and materials required for a thorough test of the system. This includes, but is not limited to, the following:

    a. VOM meter

    b. Manufacturer's recommended smoke detector testing device and sensitivity test equipment.

    c. Heat source for testing heat detectors.

    d. Keys to all control panels.

    e. Ladders

3.03 Project Closeout:

A. As Built Drawings:

1. Provide a complete set (full size scalable) of reproducible "as-built" and AutoCAD format drawings showing installed wiring, color coding, and wire tag notations for exact locations of all installed equipment, specific interconnections between all equipment, and internal wiring of the equipment upon completion of system.

B. Operating and Instruction Manuals:

1. Operating and Instruction manuals shall be submitted prior to testing of the system. Four complete sets of operation and instructions manuals shall be delivered to the owner upon request.

2. Complete, accurate, step-by-step testing instructions giving recommended and required testing frequency of all equipment, methods for testing each individual piece of equipment, and troubleshooting manual explaining how to test the preliminary internal parts or each piece of equipment shall be delivered upon completion of the system.

C. Maintenance instructions shall be complete, easy to read, understandable, and shall provide the following information:

1. Instructions on replacing any components of the system, including internal parts.

2. Instructions on periodic cleaning and adjustment of equipment with a schedule of these functions.

3. A complete list of all equipment and components with information as to the address and telephone number of both the manufacturer and local supplier of each item.

4. User operating instructions shall be provided prominently displayed on a separate sheet located next to the control unit in accordance with U.L. Standard 864.

END OF SECTION

LANDSCAPE
TECHNICAL SPECIFICATIONS

Submittal for the New Bus Drop-off and Parking
For Sherwood Elementary School, Salinas, CA

Prepared for:

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Table of Contents

SECTION 328000– IRRIGATION

PART I - GENERAL

1.01 RELATED DOCUMENTS

The provisions of the current editions of the City of Salinas Standard Specifications shall apply except as modified herein.

1.02 RELATED WORK SPECIFIED ELSEWHERE

Planting – Section 329000
Operation and Maintenance of Irrigation – Section320180
Operation-and Maintenance of Planting - Section 320190

1.03 SCOPE

Extent: in this Section includes the installation of an irrigation system, including trenching, piping, equipment, electrical, maintenance of the system, and incidentals related thereto.

1.04 STANDARDS

Irrigation system shall be installed and tested in accordance with local codes and manufacturer's specifications.

1.05 REVIEWS

A. Contractor shall specifically request the following reviews at least 48 hours prior to progressing with work:

1. Layout of the system,
2. All trenching,
3. Pressure testing of all mainlines for leaks,
4. Coverage adjustment of all heads, valve box inspection, and operation of the system.

1.06 QUALITY ASSURANCE

A. All materials shall be new and of the best quality available unless otherwise specified. Manufacturer shall be clearly marked on all material, containers, or certificates of contents for inspection.

1.07 SUBMITTALS

A. Record Drawings:

1. Record accurately on one set of contract drawings all changes in the work constituting departures from the original contract drawings.

2. The changes and dimensions shall be recorded in a legible and workmanlike manner to the satisfaction of the Owner. Prior to final inspection of work, submit record drawings to the Owner for approval.

3. Dimensions from two permanent points of reference (buildings, monuments, sidewalks, curbs, pavement, etc.). Data to be shown on record drawing shall be recorded day to day as the project is being installed. All lettering on drawings shall be minimum 1/8 inch in size.

4. Show locations and depths of the following items:
   a. Point of connection.
   b. Routing of irrigation pressure lines (dimension maximum l00 feet along routing)
   c. Irrigation control valves.
   d. Zone Control (PVC-Dripline connections) boxes
   e. Quick coupling valves.
   f. Routing of control wires.
   g. Related equipment (as directed)

5. Maintain record drawings on-site at all times. Upon completion of work, transfer all as built information and dimensions to reproducible prints. The as-built plan shall be completed and submitted to the Owner or Owner Representative before final payment shall be made for work installed.

B. Controller Charts:

1. Owner/ Landscape Architect must approve record drawings before charts are prepared.

2. Provide one controller chart for each automatic controller. Chart shall show the area covered by controller.

3. The chart is to be a reduced copy of the actual "record" drawing. In the event the controller sequence is not legible when the drawing is reduced, it shall be enlarged to a readable size.

4. Chart shall be a black line print with a different color used to show the area of coverage for each station.

5. When completed and approved, the chart shall be hermetically sealed between two pieces of plastic, each piece being a minimum 20 mils in thickness.

C. Operation and Maintenance Manuals:

1. Two individually bound copies of operation and maintenance manuals shall be delivered to the Owner 10 calendar days prior to final inspection. The manuals shall describe the material installed.

2. Each complete, bound manual shall include the following information:

   a. Index sheet stating Contractor's address and telephone number, duration of guarantee period, list of equipment including names and addresses of local manufacturer representatives.

   b. Complete operating and maintenance instructions for all equipment.

   c. Spare parts list and related manufacturer information for all equipment.

1.08 GUARANTEE

A. General: The entire irrigation system, including all work done under this contract, shall be guaranteed against all defects and fault of material and workmanship for a period of two (2) years following the filing of the Notice of Completion. All materials used shall carry a manufacturer's guarantee of two (2) years.

Should any problem with the irrigation system be discovered within the guarantee period, the Contractor at no additional expense to the Owner shall correct it within ten (10) calendar days of receipt of written notice from the Owner. When the nature of the repairs as determined by the Owner constitutes an emergency (e.g. broken pressure line) the Owner may proceed to make repairs at the Contractor's expense. The Contractor, all at no additional cost to the Owner, shall repair any and all damages to existing improvement resulting either from faulty materials or workmanship, or from the necessary repairs to correct same, to the satisfaction of the Owner.

B. After the system has been completed, the Contractor shall instruct the Owner or Owner's Representative in the operation and maintenance of the system and shall furnish a complete set of operating instructions.

C. Any settling of trenches which may occur during the one-year period following acceptance shall be repaired to Owner's satisfaction by the Contractor without any additional expense to the Owner. Repairs shall include the complete restoration of all damage to planting, paving or other improvements of any kind as a result of the work.

1.09 IRRIGATION SYSTEM DESIGN

Irrigation design is based on 60 PSI available water pressure at point of connection, and 37.5 GPM for irrigation heads. Contractor shall verify working water pressure prior to construction. Should a discrepancy exist, notify Landscape Architect prior to beginning construction.

1.10 UTILITIES

Contractor shall verify location of all on site utilities prior to trenching. Notify Landscape Architect by telephone and in writing of any conflicts prior to installation. Restoration of damaged utilities shall be made at the Contractor's expense to the satisfaction of the Owner.

PART II – PRODUCTS

2.01 GENERAL

Materials or equipment installed or furnished that do not meet the City of Salinas standards will be rejected and shall be removed from the site at no expense to the Owner.

2.02 POINT OF CONNECTION

A. Points of connection shall be below grade.

2.03 PLASTIC PIPE AND FITTINGS

A. Unless otherwise noted: lateral pipe shall be PVC Schedule 40-NP; mainline pipe shall be PVC-SCH 40-NP. Fittings for lateral piping shall be PVC Schedule 40-NP. All PVC solvent weld fittings for lateral piping shall

be PVC Schedule 40-NP. Main line fittings shall match the pipe type. All threaded fittings for lateral pipe shall be Schedule 40 PVC-NP heavy wall. All main line threaded fittings shall match the pipe type. All risers and nipples shall be Schedule 80 PVC-NP. Plastic threaded fittings shall have Permatex #2 thread sealant with Teflon or equal. PVC cement shall be IPS (Industrial Poly Chemicals) for solvent weld, with associated primer to fit pipe type and size.

2.04 CONTROL WIRE

A. Type UF, 600v. insulation, minimum size #14, copper, common ground white, U.L. approved for irrigation control use. Splices shall be sealed with approved with wire nuts enclosed in resin–filled envelopes.

2.05 VALVE BOXES

A. Precast lockable plastic of type and size as indicated on the Plans and free of all cracks, chips or structural defects. Boxes subject to vehicular traffic shall be concrete and have traffic lid covers**. All valve boxes shall be labeled with a plastic label indicating the valve station # as connected to the controller as indicated on the plans.**

2.06 IRRIGATION EQUIPMENT

A. Refer to plans. Any desired substitutions require submittals for specific written approval.

PART III - EXECUTION

3.01 GENERAL

A. Schematic: System features are shown schematically for graphic clarity. Install all piping and valves in common trenches where feasible and inside planting areas.

B. Grading: Contractor shall be responsible for installing all irrigation features to their finished grade and at depths indicated. Site grading shall be completed and/or accommodated to within .01 foot, before trenching.

C. Finish Grade: Unless otherwise noted, all heads shall be set at, and perpendicular to, finish grade. The top of all valve boxes shall be flush with finish grade.

3.02 INSTALLATION

A. Trenching: Trenching for mainline, sleeves, and laterals shall be to the required depths. Maintain excavations free of water while installing pipe and until backfilled. Mainlines, 18" deep; laterals 12" deep.

B. Pipelines: pipelines shown parallel on the Plan may be installed in a common trench. Where pipelines are shown parallel to or adjacent to shrub or ground cover areas, they shall be installed in these areas. All changes in depth of pipe shall be accomplished using 45 degree fittings.

C. Sleeving: Contractor shall adequately size sleeves for all wiring and irrigation lines to be placed (with ends clearly marked above grade) under driveways and walks prior to their construction. Sleeves to continue a minimum of 1 foot into planting areas. All main and lateral lines located beneath paving shall be sleeved with Schedule 40 PVC pipe unless otherwise noted. All wiring shall be in a separate sleeve.

D. Fabrication: All manifolds shall be neat, orderly, and constructed for ease in maintenance operations. Install manifolds to allow valve boxes to be parallel to each other and to adjacent walls, walks, and curbs. Cuts and joints shall be free of burrs, smooth and minimum in quantity.

E. Control Wire:

1. Install control wire in pipe trenches wherever practical. Tape to pipe every 10 feet. Conduits or sleeve required shall be sized, based on #14 wires. All splices shall be sealed with 3M connectors or equal. All wire shall be installed below or level with the bottom of adjacent pipes. All wiring above finish grade shall be enclosed in steel conduit. All intermittent wire splices between valves or between controller valves shall be installed in a valve box.

F. Backfilling:

1. Cover no joints until system has been pressure tested and approved by Owner/ Landscape Architect. Level bottom trenches for a smooth flat grade, and excavate bell holes where necessary to ensure that pipe rests for entire length on solid ground. Should rock or other unsuitable material be encountered, excavate to 6" below bottom of pipe and replace with well tamped and compacted approved backfill material or sand before laying pipe. When piping has been installed, tested, inspected, and approved, backfill excavations with clean earth from

excavation, or with imported sandy soil in layers not exceeding 8". The top 6" of the trenches shall contain on-site near surface soils. Backfill with potentially damaging rocks and debris shall not be permitted. Moisten and machine tamp, and restore the ground or paving to original condition. Set trenches in planting areas.

2. Backfill shall be compacted per specification in Earthwork and Grading Section under paved areas, as determined by the Laboratory Test Procedure, ASTM D1557. After backfilling, remove from the premises all surplus earth resulting from this work and dispose of same, to the satisfaction of the Landscape Architect.

G. Flushing of System: After installation of pipe lines and sprinkler risers, but before installation of sprinkler heads, thoroughly flush the system under full water main pressure to remove any foreign material in the pipes.

1. Flushing shall include flushing out the existing mainline by operating one of the existing quick couplers downstream of the new valve installation, prior to operating any portion of the system again.

H. Pressure Test:

1. Exercise caution in filling the system to prevent excessive surge pressure and water hammer.

2. Pipe subject to continuous water pressure (pressure lines) shall be tested at 125 lbs. of static pressure for two hours with a maximum 5 PSI drop. Repair any leaks, if necessary, and re-test.

3. The Contractor must furnish all equipment and temporary connections required for tests.

I. Closing in Un-inspected Work: The Contractor shall pay all costs necessitated by requiring opening, restoration and correction of all work closed in or concealed before inspection, testing as required and approval by Landscape Architect. Notify Landscape Architect 48 hours in advance of required testing.

J. Installation Inspection:

1. When the installation of the irrigation sprinkler system has been completed, the Contractor, in the presence of the Landscape Architect, shall perform a coverage and operation test to determine if the system is complete and fully operational.

2. If it is determined that adjustments in the irrigation equipment and the respacing of heads will provide more complete coverage, the Contractor shall make such adjustments prior to planting. Adjustments may also include changes in nozzle sizes and degrees of arc as necessary. The Contractor shall be responsible for obtaining complete and adequate coverage in all irrigated areas.

K. Coverage Adjustments: Adjust all heads for arc, radius, riser height, and distribution for uniform and optimum coverage. Such adjustments shall include nozzle changes without additional cost to the Owner. MP Rotator heads require a special tool to adjust heads. Provide tools to owner.

L. Clean-up: Keep project area clean on a daily basis, removing debris from the site.

END OF SECTION

SECTION 329000
PLANTING

PART I - GENERAL

1.01 RELATED DOCUMENTS

The provisions of the current editions of the City of Salinas Standard Specifications shall apply except as modified herein.

1.02 DESCRIPTION OF WORK

A. Extent: Work in this Section includes all planting, staking and related incidental work.

B. Related Work:

Irrigation– Section 328000
Operation and Maintenance of Irrigation – Section320180
Operation-and Maintenance of Planting - Section 320190

1.03 REVIEWS

A. The Contractor shall specifically request the following reviews prior to progressing with the work:

1. Plant material approval and layout
2. Substantial completion to initiate maintenance
3. Final, at end of maintenance period

1.04 SUBMITTALS

A. Within ten days after award of the Contract, Contractor shall submit notice to the Landscape Architect certifying quantity and species of plant material ordered, the nursery supplier(s), any plant material not available at that time, or proposed substitutions to be reviewed.

PART II - PRODUCTS

2.01 GENERAL

A. Nomenclature and Labels: Plant botanical names conform to "Standardized Plant Names," second edition, and secondly, "A Checklist of Woody Ornamental Plants of California, " Manual 32, University of California. All plants of each clone, species and cultivar shall be delivered

to the site labeled with their full botanical name. Every container shall be labeled with one label.

B. Quality: Minimum quality of all plant material shall conform to prevailing published specifications of the California Association of Nurserymen and the American Association of Nurserymen unless otherwise indicated. Additional specifications shall be indicated on the Plans.

C. Quantities: The quantities shown on the plant list and in labels are for the Landscape Architect's use and are not to be construed as the complete and accurate limits of the Contract. Contractor shall furnish and install all plants shown schematically on the Plans.

D. Root Systems: All container-grown stock shall be grown in its container for at least six months prior to its planting. Contractor shall allow one percent of the quantity of plants for removal and inspection. Any plant material, within two years following the final acceptance of the project, determined by the Landscape Architect to be defective, restricted, declining or otherwise deficient due to abnormal root growth, shall be replaced by the Contractor, to the equal condition of the adjacent plants, at the time of replacement.

E. Health: Foliage, roots and stems of all plants shall be of vigorous health and normal habit of growth for its species. All plants shall be free of all disease, insect stages, burns or disfiguring characteristics.

F. Untrue Species: All plant material, within two years following the final acceptance of the Project, determined by the Owner to be untrue to the species, clone, and/or variety specified, shall be replaced by the Contractor, to the equal condition of adjacent plants at the time of replacement.

2.02 TREES

A. All trees shall have straight trunks of uniform taper, larger at the bottom. Trunks shall be free of damaged bark, with all minor abrasions and cuts showing healing tissue. Sucker basal growth and lateral growth shall be removed and treated to eliminate re-sprouting. Normal lower side branching shall remain. Trees unable to stand upright without support shall be rejected.

2.04 CHEMICALS

A. Contractor shall verify use of any chemicals with Landscape Architect prior to application.

2.05 FERTILIZER

A. As determined by soil analysis and recommendation report.

2.06 TREE STAKES AND MISCELLANEOUS MATERIALS

A. As specified on the Plans.

2.07 MULCH

A. Shall be chipped wood product such as cedar or redwood chips greater than 1/2 inch and less than 2 inch in length, and no more than 1/2 inch thick, and shall contain less than 1% foreign matter including soil, weeds, seeds, etc. by dry weight.

PART III - EXECUTION

3.01 GENERAL

A. Plant Material Approvals: Before planting operations commence, the Landscape Architect shall review all plant material. Defective plants shall be removed from the site and acceptable material substituted in its place. The review does not accept defective plants, which may be installed.

B. Layout: Only those plants to be planted in any single day should be laid out. Locations of all plants shall be reviewed prior to planting. Plants installed without this review may be transplanted/relocated as directed by the Landscape Architect.

C. Protection of Plants: Contractor shall maintain all plant material in a healthy growing condition prior to and during planting operation. Contractor shall be responsible for vandalism, theft, and damage to plant material until commencement of the maintenance period.

D. Pruning: Contractor shall do no pruning without specific authorization of the Landscape Architect. The Contractor, if necessary shall replace plants pruned without authorization.

3.02 TREE AND SHRUB INSTALLATION

A. Plant Pits, Backfill and Finish Grading: See Soil Preparation Section for materials and installation requirements.

B. Basins: Construct basins as necessary to water plants. Remove basins from all plants under a permanent spray irrigation system prior to final inspection and finish grade the planting area. Basins for plants to be watered from the emitter system shall remain in place. Basin bottoms shall drain to berm away from plant stems.

C. Staking: All trees shall be staked as shown on the Plans. Stakes shall be driven securely into existing soil on the windward side of the tree. A minimum of two figure eight, wire and rubber tree ties shall be required.

D. Root barrier: Install root barrier panels along paving and footings where trees are in less than 10 ft of distance according to manufacturer's instructions.

3.03 CHEMICALS

A. Pesticide: Contractor shall verify compatibility, dosage and other application procedures with the manufacturer. A pest control operator licensed in the State of California shall apply all herbicides and pesticides.

3.04 FERTILIZER

A. If not noted otherwise in Soil Analysis and Amendment Recommendation Report apply commercial fertilizer at 5 pounds per 1,000 square feet ground cover areas, 30 days after planting. Re-application shall be scheduled at 45-day intervals until completion of Landscape Maintenance. Refer to Soil Amendment Recommendation Report.

3.05 MULCH

A. Install minimum of 3-inch mulch to all shrub and ground cover areas. See finish grading in Soil Preparation, Section 329113.

3.06 MAINTENANCE

A. See Operation & Maintenance of Planting Section 320190.

3.07 CLEAN UP

A. After completion of all operations, Contractor shall remove all trash, excess soil and other debris. All walks, walls, and pavement shall be swept and washed clean. Leave the entire area in a neat, orderly condition.

3.08 PAYMENT

A. The unit price paid for Landscape Planting shall be considered full compensation for doing all the work involved in planting plant material and installing mulch, and not separate payment shall be made.

END OF SECTION

SECTION 329113
SOIL PREPARATION

PART I - GENERAL

1.01 RELATED DOCUMENTS

The provisions of the current editions of the City of Salinas Standard Specifications shall apply except as modified herein.

1.02 DESCRIPTION OF WORK

A. Extent:
Work in this Section includes the installation of soil amendments, finish grading, plant pit backfill, and all other incidentals related.

B. Related Work:

Irrigation– Section 328000
Planting- Section 329000

1.03 REVIEWS

A. Contractors shall specifically request at least two days in advance the following reviews prior to progressing with the work:

1. Rough Site Grading completed
2. Verification of soil amendment depths
3. Finish Grade

1.04 SUBMITTALS

A. Soil Testing: Two weeks before plant installation contractor shall take soil sample of existing soil and forward to soil analysis laboratory such as A&L Laboratories http://www.al-labs-west.com/ or equal. Refer to results of this soils analysis report for exact fertilizers and soil amendments to be used in planting. Contractor shall forward analysis to topsoil supplier.

B. Certification: Written certificates stating quantity, type, and composition, weight and origin for all amendments, chemicals shall be delivered to the Landscape Architect within fourteen (14) days of the notice to proceed and before the material is delivered to the site.

C. Test Samples: Contractor shall provide a one-quart sample of proposed amendments to an agricultural soils laboratory approved by the Landscape Architect for their testing for conformance to this specification, unless delivered to the site in original, unopened containers, each bearing the manufacturer guaranteed analysis. No material shall be delivered to the site until the Landscape Architect approves the material.

1.05 PROTECTION

A. Protect concrete from any iron sulfate amendment that may be specified from soils analysis to avoid staining. Concrete damaged from amendment placement shall be replaced at the Contractor's expense.

PART II - PRODUCTS

2.01 Native Soil

Native Soil: Shall be the existing soil on the site after all rocks over one cubic inch and all foreign debris have been removed.

2.02 Top Soil

A. Imported Topsoil: Topsoil blends consist of rich sandy loam with organic materials without mushroom compost. Reference blends shall be the Enriched Topsoil Blend.

2.03 FERTILIZER

A. Refer to fertilizer type determined by Soil and Plant Lab analysis. **Use Best Packs Slow Release Fertilizer Pellets at installation per Manufacturer recommendations on bag.**

2.04 SOIL AMENDMENTS

A. Refer to fertilizer type determined by Soil and Plant Lab analysis. Submit sample analysis of amendments to Landscape Architect for approval.

PART III - EXECUTION

3.01 GENERAL

A. Limits and Grades: Prior to commencing soil preparation operations, Contractor shall request a review by the Landscape Architect to verify grading work completed to date and verify specified limits of soil preparation work to commence. Contractor shall complete the site grading necessary to round the top and toe of all slopes, providing naturalized contouring to integrate newly graded areas with the natural topography.

3.02 IMPORTED TOPSOIL PLACEMENT

A. Topsoil shall be installed and completed as necessary to produce final finish grade requirement, minimum 6". Sub grade shall be cross-ripped or cultivated to a depth of 10 inches. Water shall be added and ripping or cultivation shall be continued until the entire 10-inch depth is loose and friable. Place two inches of topsoil uniformly over sub grade and thoroughly cultivated before placing remaining topsoil. Place topsoil and bring to a smooth, even grade. Soil shall be thoroughly water settled and high/low areas re-graded in accordance with paragraph "Finish Grading" this Section.

3.03 AMENDMENT PLACEMENT

A. Refer to the formula determined by the soil analysis and recommendation report.
B. The materials shall be uniformly spread and incorporated to obtain a homogeneously blended soil, six inches in depth.

3.04 BACKFILL AND PLANT PITS

A. Soil, which has been amended in the above manner, shall be used as the backfill mix around the sides of the root balls. Only unamended soil shall be used beneath the plant's root ball. Plant root ball and pits shall have their sides and bottoms loosened and otherwise broken to prevent glazing or compaction. Plant pits shall be at least the following minimum sizes:

1-gallon container	6" backfill all around
5-gallon container	8" backfill all around
15-gallon container	10" backfill all around
Boxed	12" backfill all around

Specimens

B. Check planting holes for appropriate drainage, by filling with water. Do not plant trees or shrubs, if water does not drain. Install drainage measures such as drilling through hardpan layer, area drains, weep holes, etc.

3.05 FERTILIZER

A. For planting areas, see Landscape Planting, Section 329000 and Soil Analysis report.

B. All container stock shall receive additional Agriform tabs or Best Paks fertilizer pellets at:

1-gallon plant	1 packets
5-gallon plant	3 packets
15-gallon plant	9 packets
24" box	15 packets

C. Space the packets evenly around the ball halfway up backfill touching side of root ball.

3.06 FINISH GRADING

A. Contractor shall finish grade all planting areas unless otherwise noted, and shall remove all rocks and clods over one cubic inch. All areas shall be smooth and uniformly graded. All erosion damage during the construction period shall be repaired by the Contractor. Unless otherwise noted, all soil finish grades where mulch is not installed shall be 1/2 inch below finish grade of walks, pavements, and curbs.

B. All mulch areas shall have the finish grades 1 1/2" below edges of pavement or curbs back from the edges at least 24" to allow for the installation of the mulch.

3.07 MEASUREMENT AND PAYMENT

A. The unit price paid for Soil Preparation shall be considered full compensation for furnishing all labor and incidentals for all work involved, as specified in this Section and shown on Plans, and no separate payment shall be made.

END OF SECTION

SECTION 320180 & SECTION 320190
OPERATION AND MAINTENANCE OF PLANTING & IRRIGATION

PART I - GENERAL

1.01 RELATED DOCUMENTS

The provisions of the current editions of the City of Salinas Standard Specifications shall apply except as modified herein.

1.02 DESCRIPTION OF WORK

A. Extent: Work in this Section includes the growing and maintenance operations necessary to establish plantings, provide pest and disease control, to maintain the irrigation system and related construction elements.

B. Related Work:

1. Planting – Section 329000
2. Irrigation– Section 328000

1.03 QUALITY ASSURANCE

A. Reviews:

1. Substantial Completion: At the time all major planting, including groundcover, the irrigation system is installed, the Landscape Architect will review for a final checklist of minor items to be completed. Once completed, the Maintenance Period shall commence with approval of Landscape Architect.

2. Final Review: Contractor shall request a final review of the project within five (5) days in advance of the proposed date. Failure to request this notice shall automatically extend the date of completion. The maintenance period will continue until final completion is approved by the Landscape Architect.

3. Certificate of Completion: Per State of California Model Water Efficient Landscape Ordinance Landscape Contractor shall schedule an Irrigation Audit with a certified Irrigation Auditor (third party), which is

required to fill out the Certification of Completion. welo_certificate_of_completion.pdf

PART II - MATERIALS

2.01 FERTILIZER

A. As specified in Planting, Section 329000

2.02 PRE-AND/OR POST-EMERGENT HERBICIDE

A. Only as recommended by licensed Pest Control Operator and approved by Landscape Architect.

PART III - EXECUTION

3.01 GENERAL

A. Time Limits: maintenance period shall commence from the date of substantial completion and extend for 60 calendar days, or until final completion approval.

B. Contractor's Responsibility: Work installed under this Contract damaged by vandalism, vehicular damage and/or theft during the installation of the work and up to the Substantial Completion approval, shall be repaired or replaced by the Contractor without costs to the Owner.

C. Owner's Responsibility: Throughout the maintenance period, these damages and similar factors such as excessive litter, abuse and defacement shall be the Owner's responsibility to repair or replace and shall not be a part of this Contract.

3.02 BASIC REQUIREMENTS

A. All planting areas shall be kept weed-free at all times during the maintenance period. All pests and disease control shall be the Contractor's responsibility. All planting areas shall be kept at optimum moisture for plant growth. Planting not adequately served by the automatic irrigation system shall be hand watered. Settlement of soil and plants and soil erosion shall be repaired and areas replanted. Dying or deficient plants shall be replaced as they become apparent.

B. Weeding, Cultivating, and Clean-Up: Planting areas shall be kept neat and free from debris at all times and shall be cultivated and weeded at not more than ten (10) day intervals.

C. Fertilizer: Shall be as specified in the Planting Section 329000.

D. Pruning: Prune new trees and shrubs with the direction of the Landscape Architect. Do not remove lower branches from multi-trunk or low branching trees unless directed.

E. Insect, Pest, and Disease Control: Insects, pests, rodents and diseases shall be controlled by the use of approved insecticides and fungicides, only as recommended and applied by a licensed pest control operator.

F. Replacement Materials: Immediately replace any dead or damaged plant materials. Replacements shall be made to the specifications as required to match adjacent plantings at no cost to the Owner.

G. Irrigation: Contractor shall schedule and monitor controller stations as necessary to minimize water consumption while still providing adequate water for the plant material. Contractor shall adjust and clean all heads, arcs and radii, valves, and other equipment as necessary including drip system, filters, and emitters to maintain the system.

H. Upon completion of the installation of the irrigation system and irrigation audit shall be performed. Results of the audit need to be submitted to the Monterey Regional Water Management District.

I. Contractor shall leave established irrigation schedule at end of maintenance period in the controller. Contractor shall review schedule with maintenance personnel prior to final payments.

3.03 CONDITION OF PLANTING AT END OF MAINTENANCE PERIOD

A. Planting areas shall be free of all weeds (broadleaf and grass weeds). Plantings that do not conform to specifications shall be replaced and brought to a satisfactory condition before final acceptance of the work.

END OF SECTION