INVITATION FOR BIDS

FOR CONSTRUCTING

LAGUNA TREATMENT PLANT MAINTENANCE BUILDING OFFICE EXPANSION

CONTRACT NUMBER
C01889

ISSUED BY

CAPITAL PROJECTS ENGINEERING DIVISION

CITY OF SANTA ROSA, CALIFORNIA

2017

A T T E N T I O N
Prebid Conference
See Page 1

City of Santa Rosa

STATE OF CALIFORNIA

INVITATION FOR BIDS

CONTAINING:

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SPECIAL PROVISIONS

BID FORMS

CONTRACT

FOR

LAGUNA TREATMENT PLANT
MAINTENANCE BUILDING OFFICE EXPANSION

Contract No. C01889

LAGUNA TREATMENT PLANT
MAINTENANCE BUILDING OFFICE EXPANSION

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CITY OF SANTA ROSA
STATE OF CALIFORNIA

NOTICE TO BIDDERS

➢	For technical questions regarding this project, contact Emma Walton at (707) 543-4516.
➢	For direct access to plans, specifications and planholders' lists, go to **www.srcity.org/bids** and click on Bid/Proposal Opportunities or call (707) 543-3800.
➢	For direct access to bid results, go to **www.srcity.org/bids**. Under Link to Capital Projects, click on Capital Projects Contracts or call (707) 543-3835.

- IMPORTANT -

Bid Acceptance Deadline

Sealed bids will be accepted at the Transportation and Public Works Department, 69 Stony Circle, Santa Rosa, California 95401 until 2:00 p.m., April 11, 2017, for Laguna Treatment Plant Maintenance Building Office Expansion, Contract No. C01889. (Engineer's Estimate: $105,000.)

Bids tendered after this deadline will not be accepted. The official time clock for accepting bids will be an electric date and time stamping clock, located in the Transportation and Public Works Department, 69 Stony Circle, Santa Rosa, California. In order to be accepted, bids must be received prior to 2:00 p.m. Therefore, a bid stamped in at 1:59 p.m. will be accepted, but one delivered at or after 2:00 p.m. is late and will not be accepted.

Pre-Bid Meeting

Prospective bidders, subcontractors, and material suppliers are invited to attend a pre-bid meeting scheduled to be held at 11:00 a.m., April 4, 2017, at the Laguna Treatment Plant located at 4300 Llano Road, Santa Rosa, California.

Subcontractor Information; Department of Industrial Relations Registration

Bidders shall provide the names, business addresses and license numbers of all subcontractors listed on bidder's List of Subcontractors. No contractor or subcontractor may be listed on a bid for this public works project unless registered with the Department of Industrial Relations (DIR) pursuant to Labor Code section 1725.5. No contractor or subcontractor may be awarded a contract for this public works project unless registered with the DIR pursuant to Labor Code section 1725.5. This public works project is subject to compliance monitoring and enforcement by the DIR.

CITY OF SANTA ROSA
ESTIMATED QUANTITIES
LAGUNA TREATMENT PLANT MAINTENANCE BUILDING OFFICE EXPANSION

Item No.	Description	Quantity	Units
1	LAGUNA TREATMENT PLANT MAINTENANCE BUILDING OFFICE EXPANSION	1	LS

The foregoing quantities are approximate only, being given as a basis for the comparison of bids, and the City of Santa Rosa does not expressly or by implication, agree that the actual amount of work will correspond therewith, but reserves the right to increase or decrease the amount of any class or portion of the work, as may be deemed necessary or expedient by the Engineer.

Bids shall be made in accordance with the prevailing hourly rate of per diem wages for this locality and project as determined by the Director of the DIR pursuant to Labor Code sections 1770 *et seq*.

Contractor shall be responsible for compliance with the Immigration Reform Control Act of 1986.

If the project requires the employment of workers in any apprenticeable craft or trade, once awarded, Contractor and subcontractors must apply to the Joint Apprenticeship Council unless already covered by local apprentice standards (see Labor Code section 1777.5).

All bids are to be compared on the basis of the Engineer's estimate of the quantities of work to be performed. No bid will be awarded to a contractor who is not licensed in accordance with the provisions of Chapter 9 of Division 3 of the Business and Professions Code. Contractor must hold a Class B license for this project.

Project plans, bid and contract forms for C01889 Laguna Treatment Plant Maintenance Building Office Expansion may be obtained through PlanetBids at **www.srcity.org/bids**. These documents can no longer be obtained at the Transportation and Public Works Department.

No bid will be accepted unless it is made on the contract bid forms furnished by the Transportation and Public Works Department through PlanetBids. The original of the completed bid forms bearing original signatures must be submitted. A bid will not be accepted unless the bidder registers as a vendor through PlanetBids at **www.srcity.org/bids**, downloads documents/attachments, and is added to the prospective bidders list for this project. If there is an addendum, bidders must log into PlanetBids and acknowledge the addendum to be eligible for bidding.

The successful bidder will be required to hold a current City of Santa Rosa business tax certificate issued pursuant to Chapter 6.04 of the Santa Rosa City Code before commencing work on this project. For information regarding the business tax, contact Revenue and Collections at (707) 543-3170.

For any moneys earned by Contractor and withheld by the City of Santa Rosa to ensure the performance of the Contract, Contractor may, at its request and expense, substitute securities equivalent to the amount withheld in the form and manner and subject to the conditions provided in Section 22300 of the California Public Contract Code.

The City of Santa Rosa reserves the right to reject any or all bids and the right to waive minor irregularities or informalities in any bid or bonds.

TRACY DUENAS
Supervising Engineer Date

SPECIAL PROVISIONS

General Specifications

CITY OF SANTA ROSA, CALIFORNIA

LAGUNA TREATMENT PLANT MAINTENANCE BUILDING OFFICE EXPANSION

1 GENERAL

The work described herein shall be done in accordance with the "Contract Documents," which are the:

1. Special Provisions
2. Project Plans, consisting of 22 sheets entitled Laguna Treatment Plant Maintenance Building Office Expansion, 2015-0027
3. City of Santa Rosa Design and Construction Standards (City Standards)
4. City of Santa Rosa Construction Specifications for Public improvements (City Specifications)
5. State of California Department of Transportation Standard Specifications 2010 (Standard Specifications), and
6. State of California Department of Transportation Standard Plans 2010 (Standard Plans).

In the event of a conflict in any of these documents, the order of precedence shall be determined by Section 5-1.02 of these Special Provisions.

Whenever the Standard Specifications use the terms State of California, Department of Transportation, Director, Engineer, or Laboratory, the following terms shall be substituted therefor, and any reference to any of the foregoing terms shall be understood and interpreted to mean and refer to such substituted terms as follows:

For State of California - the City of Santa Rosa;

For Department - the City of Santa Rosa Department of Transportation and Public Works or the City of Santa Rosa Water Department;

For Director - the City Engineer of the City of Santa Rosa;

For Engineer - the City Engineer of the City of Santa Rosa or the City Engineer's authorized agents;

For Laboratory – Materials Engineering of the City of Santa Rosa Water Department, or such other laboratory as may be authorized by the City.

Whenever the Project Plans and Specifications use the terms Owner or Architect, the following terms shall be substituted therefor, and any reference to any of the foregoing terms shall be understood and interpreted to mean and refer to such substituted terms as follows:

For Owner, substitute - City Engineer of the City of Santa Rosa

For Architect, substitute - City Engineer of the City of Santa Rosa

Unless otherwise provided, whenever in these Special Provisions attention is directed to specific provisions in the Standard Specifications, such direction shall not be interpreted as excluding other applicable provisions of the Standard Specifications.

Unless otherwise provided, when sections and subsections of the Standard Specifications are used in these Special Provisions, such use is not exclusive and shall not be interpreted as excluding other applicable provisions of said sections and subsections, but is only intended to add to or modify such sections or subsections.

Unless otherwise provided, full compensation for compliance with these Special Provisions is included in the contract price and no additional allowance will be made to Contractor therefor.
The Standard Specifications are hereby modified to delete any reference or incorporation of provisions providing for or requiring arbitration of any and all claims and disputes arising under this contract.

2 BIDDING

2-1.06 Bid Documents: Prospective bidders will be furnished with an Invitation for Bids which will state the location and description of the contemplated public works project and will show the approximate estimate of the various quantities and kinds of work to be performed and materials to be furnished with a schedule of items for which unit prices are requested.

2-1.07 Approximate Estimate: The quantities given in the Contract Documents are approximate only, being given as a basis for the comparison of bids, and the City does not, expressly or by implication, agree that the actual amount of work will correspond therewith, but reserves the right to increase or decrease the amount of any class or part of the work or to omit parts of the work, as may be deemed necessary or advisable by the Engineer.

2-1.31 Examination of Project Plans, Specifications, City Standards, Invitation for Bids and Work Site: Prior to submitting a bid, the bidder shall carefully examine the Project Plans, Invitation for Bids, City Standards and the proposed work site. If any person contemplating submitting a bid for this public works project is in doubt as to the meaning of any part of the Contract Documents, or finds discrepancies in or omissions from the Contract Documents, he or she may submit a written request for interpretation or correction to the Engineer. The written request must be received by the Engineer a minimum of **96** hours prior to bid opening. Any interpretation or correction of the Contract Documents prior to bid opening will be made only by written addendum issued by the City. A copy of such addendum will be mailed or faxed to each Planholder. The City will not be bound by any other explanations or interpretations of the Contract Documents.

2-1.33 Bid Document Completion: Any references to Opt Out of Payment Adjustments for Price Index Fluctuations in the Standard Specifications are deleted in their entirety.

2-1.33A Bid Forms: All bids shall be made on bid forms obtained from PlanetBids at **www.srcity.org/bids**. The bidder shall submit its bid on the original bid forms furnished by the City. Bids submitted on forms other than the forms furnished to the bidder by the City will not be considered.

The bid forms to be submitted at the time of and with the bid are:

1. Unit Price Schedule
2. List of Subcontractors
3. List of Previous Similar Jobs
4. Noncollusion Declaration
5. Bid Guaranty Information and Bidder's Information and Signature
6. Bid Guaranty (Bid Bond or alternate security)

All bids shall give the proposed prices and must bear the original signature of the bidder. Bidders shall fill in all blanks on the bid forms where required. A bid will not be accepted unless the bidder registers as a vendor through PlanetBids at **www.srcity.org/bids**, downloads documents/attachments, and is added to the prospective bidders list for this project. If there is an addendum, bidders must log into PlanetBids and acknowledge the addendum to be eligible for bidding.

2-1.33B Registration with DIR: No contractor or subcontractor may be listed on a bid for this public works project unless registered with the Department of Industrial Relations (DIR) pursuant to Labor Code section 1725.5. No contractor or subcontractor may be awarded a contract for this

public works project unless registered with the DIR pursuant to Labor Code section 1725.5. This public works project is subject to compliance monitoring and enforcement by the DIR.

2-1.33C Subcontractors: The Subletting and Subcontracting Fair Practices Act, Public Contract Code sections 4100-4113, inclusive (the "Act") shall apply to all subcontracts in excess of one-half of one percent of the total amount of a bid. The Act requires subcontractors, if used for such work, to be listed in the contractor's bid and prohibits the substitution of subcontractors, except as authorized by the Act. Each bidder shall, with respect to the work of any subcontractor in excess of one-half of one percent of the total amount of the bid, include as part of the bid on the bid form provided:

1. The name, business address and DIR registration number of each subcontractor who will perform work or labor or render services to the Contractor in or about the construction of the work or improvement, or a subcontractor licensed by the State of California who, under subcontract to the Contractor, specially fabricates and installs a portion of the work or improvement according to detailed drawings contained in the Project Plans or other Contract Documents in an amount in excess of one-half of one percent of the Contractor's total bid; and

2. The portion of the work that will be done by each subcontractor. Only one subcontractor shall be listed for each portion.

The purchase of sand, gravel, crushed rock, batched concrete, aggregate, ready-mixed concrete, and/or any other materials produced and furnished by established and recognized commercial plants, together with the delivery of such materials to the work site by the source of the materials or by recognized commercial hauling companies, is not considered as subcontracting under this section.

2-1.33E Rejection of Bids Containing Alterations, Erasures or Irregularities: Bids may be rejected if they show any alterations of forms, additions not called for, conditional bids, incomplete bids, erasures or irregularities of any kind.

2-1.34 Bid Guaranty: All bids shall be presented under sealed cover and shall be accompanied by cash, cashier's or certified check, or by a bidder's bond made payable to the City of Santa Rosa and executed as surety by a corporate surety authorized and admitted to transact a surety business in the State of California in an amount equal to ten percent of the amount of the bid. No bid shall be considered unless such cash, cashiers or certified check, or bidder's bond is enclosed with the bid. Any bidder's bond shall contain provisions for forfeiture consistent with California Public Contract Code section 20172.

2-1.40 Withdrawal of Bid: A bid may be withdrawn prior to, but not after, the hour fixed in the public notice for the opening of bids, provided that a written request to withdraw the bid, executed by the bidder or the bidder's authorized representative, is filed with the Engineer before this deadline. The withdrawal of a bid shall not prejudice the right of a bidder to submit a new bid.

2-1.43 Public Opening of Bids: Bids will be opened and read publicly at the time and place indicated in the Notice to Bidders. Bidders or their authorized agents are invited to be present.

2-1.46 Disqualification of Bidders: Serial bids from the same bidder will not be accepted. This section shall not be interpreted to mean that the same contractor may not be the contractor in one bid and listed as a subcontractor in another bid, provided that no collusion exists.

2-1.48 Competency of Bidders: No bid will be accepted from or contract awarded to a contractor that is not licensed in accordance with the law, that does not hold a license qualifying it to perform work under this contract, to whom a bid form has not been issued by the Engineer, or that has not

successfully completed projects of similar character, scope and cost to the proposed project. Bidders will be required to provide a list of previous similar jobs with their bids.

3 CONTRACT AWARD AND EXECUTION

3-1.04 Contract Award: The City reserves the right to reject any or all bids. Bids are required for the entire work described herein. All bids will be compared with the Engineer's estimate of the quantities of work to be completed. Contract award, if any, will be made to the lowest responsible bidder within sixty days from the date bids are opened.

3-1.05 Contract Bonds: The successful bidder will NOT be required to furnish a performance bond or material guaranty bond for this project. In the event that the contract award exceeds $25,000.00, the successful bidder will be required to provide a payment bond for labor and materials within ten days after receipt of the Notice of Award in accordance with California Civil Code section 9550, executed in a sum of 100% of the Contract price. **A BID BOND IS REQUIRED. REFER TO SECTION 2-1.34 OF THESE SPECIAL PROVISIONS.**

The bond(s) shall be provided in a form acceptable to the City and issued by a corporate surety in good financial standing and authorized and admitted to transact a surety business in the state of California for the purposes and in the amount(s) stated above.

Whenever the financial or legal status of any surety on any such bond(s) is/are unacceptable to the City, it may make a demand to Contractor for further bond(s) or additional surety, not exceeding the sums originally required. Thereafter, no payment shall be made upon the Contract to Contractor or any assignees of Contractor until such bond(s) or additional surety has/have been provided to the City.

3-1.07 Indemnification and Insurance: Indemnification: Contractor shall defend, hold harmless and indemnify City, its officers, agents and employees, and each and every one of them, from and against any and all actions, damages, costs, liabilities, claims, demands, losses, judgments, penalties, costs and expenses of every type and description, including, but not limited to, any fees and/or costs reasonably incurred by City's staff attorneys or outside attorneys and any fees and expenses incurred in enforcing this provision (hereafter collectively referred to as "Liabilities"), including but not limited to Liabilities arising from personal injury or death; damage to personal, real or intellectual property or the environment; contractual or other economic damages, or regulatory penalties, arising out of or in any way connected with the performance of or the failure to perform the Contract by Contractor, any subcontractor or agent, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, whether or not such Liabilities are caused in part by a party indemnified hereunder, or such Liabilities are litigated, settled or reduced to judgment; provided, that the foregoing indemnity does not apply to liability for any damage or expense for death or bodily injury to persons or damage to property to the extent arising from (i) the sole negligence, or willful misconduct of, or defects in design furnished by City, its agents, servants, or independent contractors who are directly responsible to City (excluding Contractor), or (ii) the active negligence of City.

The existence of any of the insurance policies or coverages described in this Contract shall not affect or limit any of City's rights hereunder, nor shall the limits of such insurance limit Contractor's liability to the City hereunder. The provisions of this section shall survive any expiration or termination of the Contract.

Insurance: Contractor shall maintain in full force and effect all of the insurance coverage described in and in accordance with the insurance requirements set forth below. Maintenance of such insurance coverage during the entire performance of the Contract is a material element of the Contract. Failure by Contractor to (i) maintain or renew coverage, (ii) provide notice of any changes, modifications, or reductions in coverage, or (iii) provide evidence of renewal, if necessary, may be deemed a material breach of the Contract by Contractor, whereas the City shall be entitled to all rights and remedies at law or in equity. Notwithstanding the foregoing, any

failure by Contractor to maintain required insurance coverage shall not excuse or alleviate Contractor from any of its other duties or obligations under the Contract. In the event Contractor retains or utilizes any subcontractors or sub-consultants in performance of the work, Contractor shall assure that any such subcontractor has first obtained, and shall maintain, all of the insurance coverage requirements herein set forth below.

Insurance Requirements:

A. **Insurance Policies:** Contractor shall maintain and keep in full force and effect, the following policies of insurance with minimum coverage as indicated below and issued by insurers with an AM Best rating of no less than A-:VI or a rating otherwise acceptable to the City.

B.

	Insurance	Minimum Coverage Limits	Additional Coverage Requirements
1.	Commercial general liability	$ 3 million per occurrence $ 3 million aggregate	Coverage must be at least as broad as ISO CG 00 01 and must include products liability and completed operations coverage which shall continue for a period of 365 days after acceptance of the work by the City. If insurance applies separately to a project/location, aggregate may be equal to per occurrence amount. Coverage may be met by a combination of primary and umbrella or excess insurance but umbrella and excess shall provide coverage at least as broad as specified for underlying coverage. Coverage can be provided in the form of an endorsement to Contractor's insurance (at least as broad as ISO Form CG 20 10, 11 85 or both CG 20 10 and CG 23 37 forms if later revisions used). Coverage shall not exclude subsidence.
2.	Business auto coverage	$ 1 million	ISO Form Number CA 00 01 covering any auto (Code 1). Insurance shall cover owned, non-owned and hired autos.
3.	Workers' compensation and Employer's Liability	$ 1 million	As required by the State of California, with Statutory Limits and Employer's Liability Insurance with limit of no less than $1 million per accident for bodily injury or disease. The Workers' Compensation policy shall be endorsed with a waiver of subrogation in favor of the City for all work performed by the Contractor, its employees, agents and subcontractors.

Endorsements:

1. All policies shall provide or be endorsed to provide that coverage shall not be canceled by either party, except after prior written notice has been provided to the City in accordance with the policy provisions.
2. Liability policies shall provide or be endorsed to provide the following:
    a. For any claims related to this Contract, Contractor's insurance coverage shall be

primary and any insurance or self-insurance maintained by City shall be in excess of Contractor's insurance and shall not contribute with it. Endorsements at least as broad as 20 01 04 13 or evidence of policy language will be required in non ISO CGL policies.

b. The City of Santa Rosa, its officers, agents and employees are to be covered as additional insureds on the CGL policy. Additional Insured Endorsements at least as broad as 20 10 04 13 or 20 38 04 13 are required.

C. Verification of Coverage and Certificates of Insurance: Contractor shall furnish City with original certificates and endorsements effecting coverage required above. Certificates and endorsements shall make reference to policy numbers. All certificates and endorsements are to be received and approved by the City before work commences and must be in effect for the duration of the Contract. The City reserves the right to require complete copies of all required policies and endorsements during the duration of the Contract and for a period of 365 days following City's acceptance of the work.

D. Other Insurance Provisions:

1. No policy required by this Contract shall prohibit Contractor from waiving any right of recovery prior to loss. Contractor hereby waives such right with regard to the indemnitees.
2. All insurance coverage amounts provided by Contractor and available or applicable to this Agreement are intended to apply to the full extent of the policies. Nothing contained in this Agreement limits the application of such insurance coverage. Coverage for an additional insured shall NOT be limited to the insured's vicarious liability. Defense costs must be paid in addition to coverage amounts.
3. Self-insured retentions above $10,000 must be approved by the City. At the City's option, Contractor may be required to provide financial guarantees.
4. City reserves the right to modify these insurance requirements, including limits, based on the nature of the risk, prior experience, insurer, coverage, or other special circumstances.

3-1.18 Contract Execution: The fully executed Contract, original bonds and insurance certificates and endorsements required under the Contract shall be delivered to the City within ten calendar days of Contractor's receipt of the Notice of Award.

The Engineer will supply Contractor with up to ten sets of the Invitation for Bids and Project Plans. At least one complete set of the Invitation for Bids and Project Plans shall be kept at the construction site in good condition and made available to the Engineer at all times. Additional copies of the Invitation for Bids and Project Plans will be provided by the Engineer at Contractor's cost.

3-1.20 Failure to Execute Contract: Contractor's failure to deliver to the City the fully executed Contract within ten calendar days of Contractor's receipt of the Notice of Award shall be cause for the cancellation of the award and the forfeiture of the bid guaranty to the City. If the successful bidder refuses or fails to execute the Contract, the City may award the Contract to the second lowest responsible bidder. If the second lowest responsible bidder refuses or fails to execute the Contract, the City may award the Contract to the third lowest responsible bidder. The refusal or failure by the second or third lowest responsible bidder to deliver to the City the fully executed Contract within ten calendar days of receipt of the Notice of Award to the respective bidder shall likewise be cause for the cancellation of the award and the forfeiture of the bid guaranty of the respective bidder. In its discretion, the City may then re-advertise the project or construct it by day labor.

3-1.21 Return of Bid Guarantees: Within ten days after the opening of bids, the City will return the bid guarantees to all bidders except the three lowest responsible bidders. The bid guarantees

of the three lowest responsible bidders will be retained until the Contract has been fully executed. In the event all bids are rejected, all bid guarantees will be returned to the respective bidders.

3-1.22 Subcontractors: The successful bidder shall furnish a list of all subcontractors as required under Sections 2-1.33C & D. The list shall include the name, business address, DIR registration number and the state contractor's license number of each subcontractor on the list and the names of the responsible managing employees whose names appear on the subcontractors' licenses.

4 SCOPE OF WORK

4-1.05 Changes and Extra Work: All changes to the Contract shall be made by written change order only.

All extra work shall be recorded by Contractor on a daily report signed by both the City and Contractor. The "daily reports" shall thereafter be considered the true record of extra work performed. A copy of the daily reports will be furnished to Contractor. Contractor is directed to Section 9-1.04 of this Invitation for Bids.

4-1.05C Compensation for Altered Quantities: Payment and compensation for altered quantities shall conform to the provisions of Section 9-1.06 of the Standard Specifications, except as modified herein.

5 CONTROL OF WORK

5-1.02 Contractor's Copies of Contract Documents: In the event of a conflict in any of the Contract Documents, the order of precedence from highest to lowest shall be as follows:

1. Special Provisions
2. Project Plans, consisting of 22 sheets entitled Laguna Treatment Plant Maintenance Building Office Expansion, 2015-0027
3. City Standards
4. City Specifications
5. Standard Specifications
6. Standard Plans

5-1.05 Order of Work: The work as shown on the Project Plans and as specified in the Invitation for Bids shall be constructed in a sequence that is satisfactory to and approved by the Engineer.

Contractor shall prepare a work schedule per Section 8-1.02 of the Standard Specifications.

With the exception of trenching, all existing street, street light base, curb and gutter, storm drain, water line, and sewer line work shall be completed before any existing street paving is removed.

Full compensation for the conformance to the requirements of this section is included in the Contract price and no additional allowance will be made to Contractor for this work.

5-1.17 Character of Workers: Contractor is directed to Section 5-1.17 of the Standard Specifications which states:

> "If any subcontractor or person employed by the Contractor shall appear to the Engineer to be incompetent or to act in a disorderly or improper manner, he shall be discharged immediately on the request of the Engineer, and such person shall not again be employed on the work."

No additional compensation shall be granted to Contractor in the event City exercises any part of its rights under this section and any and all costs related to such exercise shall be borne by Contractor.

5-1.20 Cooperation with Other Entities: Attention is directed to Section 5-1.20 of the Standard Specifications.

Other construction including but not limited to utility, power, and pipe line relocation, may be in progress by other forces within and adjacent to the project area at the same time work is being performed under this Contract by Contractor.

Contractor shall cooperate with the forces performing other work, to the end that such forces may conduct their operations with as little inconvenience and delay as possible. Contractor shall grant such forces access to the project area as is reasonable and necessary to transport materials and equipment to the site of operations by the other forces.

5-1.20B(4)(a) Offsite Staging Areas and Construction Yards: Attention is directed to Santa Rosa City Code section 20-52.040, Temporary Use Permit.

A Temporary Use Permit shall be obtained for any offsite construction yard on private property to be used for any of the following:

a. Stockpiling of equipment and/or materials;
b. Staging of construction;
c. Placement of work trailers or mobile offices;
d. Storage of trench spoils; or
e. Other construction related activities not specifically enumerated above.

5-1.26 Lines and Grades: Contractor shall carefully preserve all bench marks, grade stakes, and all other survey markers. In the case of willful or careless destruction, Contractor shall bear the cost of replacing the markers.

Contractor shall contact the Engineer directly for coordination of survey staking. Written staking requests must be submitted at least two working days in advance of the date and time stakes are needed.

5-1.27B Examination and Audit: Pursuant to California Government Code section 8546.7, any contract with the City involving expenditures in excess of $10,000 shall be subject to the examination and audit of the California State Auditor for a period of three years after final payment is made to Contractor by City under this Contract. Any such examination and audit will be confined to those matters connected with the performance of this Contract.

5-1.30A Inspection: Contractor shall bear all costs associated with the re-inspection of any defective, rejected or unauthorized work as determined by the Engineer in Engineer's sole discretion. Such costs of re-inspection, including any costs incurred by the City for additional staff time or fees for third-party consultant inspectors, will be deducted from one or more progress payments hereunder.

5-1.36A Property and Facility Preservation: Attention is directed to Section 5-1.36 of the Standard Specifications.

At Contractor's sole expense, all fences, gates, landscaping, drainage ditches, sidewalks, irrigation systems, and any other improvements that are damaged, removed or destroyed because of Contractor's operations, shall be replaced in accordance with City Standards at a minimum and restored to the same or better condition. Concrete surface treatment and score marks shall match adjacent existing concrete improvements.

5-1.36E Obstructions: Attention is directed to Section 5-1.36 of the Standard Specifications and to the possible existence of underground gas mains, high voltage lines, telephone ducts, storm drains and water and sewers systems, the locations of which are not shown on the Project Plans. The determination of the location of these facilities and the cost of repair or replacement in the event of damage to such facilities are the sole responsibility of Contractor.

Should Contractor alter any public utility or private improvements to facilitate its operations or for its sole benefit, which alteration would not be otherwise required, Contractor shall make whatever arrangements are necessary with the owner or controlling authorities, and shall bear all expenses in connection therewith. Any damages to any public utility or private improvement caused by Contractor shall be repaired by Contractor at its sole expense and to the full satisfaction of the Engineer or the controlling authority.

Any subsurface information and data furnished under any part of this Contract are not intended as a representation or warranty but are furnished for information only. It is expressly understood that the City will not be responsible for the accuracy thereof or for any deduction, interpretation or conclusion drawn therefrom by Contractor. The information is made available so that Contractor may have ready access to the same information available to the City and is not part of this Contract.

PRIOR TO STARTING ANY EXCAVATION, CONTRACTOR SHALL (AT LEAST TWO WORKING DAYS IN ADVANCE) CALL UNDERGROUND SERVICE ALERT (USA) toll free at (800) 227-2600 and provide USA with all necessary data relative to the proposed excavation. USA will accept calls and process information to participating agencies who have underground facilities in the area between the hours of 7:30 a.m. and 5:00 p.m. daily, except Saturdays, Sundays, and holidays. Between the hours of 5:00 p.m. and 7:30 a.m., calls will be recorded and then processed after 7:30 a.m. For emergency situations, after hours, and on Saturdays, Sundays and holidays, Contractor shall contact the owner of the affected facility.

Contractor shall coordinate all work with the appropriate City field personnel. When City work forces are required at the job site to perform Contract items of work, Contractor shall give a minimum of two working days advanced notification to the appropriate field office:

Water Division:	(707) 543-4200
Sewer Division:	(707) 543-4200
Street Division:	(707) 543-3880
Survey Division:	(707) 543-3834

5-1.43 Arbitration: Any references to Arbitration in the Standard Specifications are deleted in their entirety.

6 CONTROL OF MATERIALS

6-2.01 Source of Supply and Quality of Materials: All materials required to complete the work under the Contract shall be furnished by Contractor and shall be free of hazardous substances.

6-3.01 General: Statistical means will not be used by the City for determination of Standard Specification compliance. Whenever both operating range test results and Contract compliance requirements are specified in these special provisions, the operating range requirements shall apply to the individual test results.

6-3.01A Material Submittals: Upon award of the Contract by City, Contractor shall submit to the Engineer a list of all materials proposed to be used on this project and any supporting documentation and/or samples required and source of supply.

For material listed on the "Engineer's List of Approved Items" which is located in the Sewer and Water sections only of the City Standards, the Engineer shall be provided with the name of the manufacturer and model/part number for all material proposed for this project, unless that item has been replaced as shown on the Project Plans or in the Invitation for Bids.

For all other materials used on this project, regardless of the type of work, Contractor shall provide to the Engineer the name of the manufacturer and model/part number along with supporting documentation and/or samples that will allow the Engineer to determine the material's acceptability.

The Engineer reserves the right to reject any proposed material, whether on the City's "Engineer's List of Approved Items" or not. If the City obtains information indicating that a listed item is not performing satisfactorily or is found to be defective, that item will be rejected and Contractor shall submit a replacement for review at no additional cost to the City.

6-3.01B Material Guarantee: Before any contract is awarded, the bidder may be required to furnish samples of materials and detailed descriptions of equipment to be used in the construction of the project. The materials samples may be subjected to the tests provided for in the Standard Specifications or in this Invitation for Bids to determine their quality and fitness for the project. The successful bidder shall unconditionally guarantee project materials and workmanship for a period of one year from the date of recording of the Notice of Completion. The guarantee shall cover 100% of all costs of repairs within the one year period, including all costs of labor, materials, equipment, and incidentals. Except as may be otherwise provided in Section 3-1.05, the successful bidder shall provide a surety bond executed by a corporate surety authorized and admitted to transact a surety business in the state of California in the minimum amount of one-half of the Contract price to cover this guarantee.

6-3.05 Quality Assurance: California Test 216 (Relative Compaction) testing will be modified as follows: A mechanical compactor (Ploog Engineering Co. Model M 100 or equivalent) with 10-pound hammer and split compaction molds shall be used in lieu of the specified manual compaction equipment.

California Test 231 (Nuclear Gage Determination of In-Place Density) will be modified as follows: In-place density and relative compaction may be determined on the basis of individual test sites in lieu of the area concept, at the discretion of the Engineer.

6-4 Water Utility

6-4.01A Construction Water: All water required for the performance of the work shall be provided by Contractor. Prior to obtaining water from the City's water system, Contractor shall obtain a Water

Use Permit from the City of Santa Rosa Water Department and rent a hydrant or bridge meter. Contractor is responsible for the cost of all water and the cost of all deposits, permits and fees.

Contractor is prohibited from operating gate valves or fire hydrants on the City system.

The acquisition of water from the City's water system through un-metered hydrants or other facilities is a violation of City ordinance and State law. The use of water from sources other than the City's water system must be approved by the Engineer in advance of the use.

The Contractor may elect to use reclaimed wastewater from standpipes located at the project site. This water is available for use by the Contractor at no charge. This water is non-potable. The Contractor is solely responsible for any environmental or health risks associated with its use. None of this water may be discharged to the surface or to any water of the State of California. Provisions of potable water for this project will be at the cost and sole responsibility of the Contractor.

Citations and fines will be levied for violation of these and other utility regulations and deductions will be made from payments consistent with Section 7-1.02A(1) of the Standard Specifications.

6-4.01B Water Utility Notification: Contractors or parties requiring work of any kind by the City of Santa Rosa Water Department forces shall request such services a minimum of 48 hours in advance of the time such services are desired. Work requests which will involve the City of Santa Rosa Water Department forces for more than eight hours or an extensive number of City parts shall be requested a minimum of seven calendar days in advance.

If it is necessary to terminate or disrupt utility service to any customer, Contractor shall make the request for such work by City forces an additional 72 hours (three additional working days for a total of five working days advance notice) in advance of the time such services are desired to allow affected customers a minimum of 72 hours' notice. Contractors who fail to keep field appointments will be billed for scheduled City of Santa Rosa Water Department crew standby time which was used and the Contractor shall bear the costs incurred by the City of Santa Rosa's Water Department for re-notification of customers.

City of Santa Rosa Water Department crews work a 9/80 schedule. This schedule may prohibit shutdowns for tie-ins on alternating Fridays. After hours work or weekend work may be performed if prior authorization from the Engineer is obtained.

Other than the hours specified in this Invitation for Bids, requests by Contractor for after hours or weekend work is to be avoided whenever possible. Any overtime costs incurred by City for such work shall be borne by Contractor.

Interruption of utilities service to commercial customers shall be coordinated with the customer to minimize disruption to the enterprise to the greatest extent practicable. After notification by the Contractor of the need, the City of Santa Rosa Water Department will contact all commercial customers and inform Contractor accordingly.

6-4.01C Water Facility Damage: All damage caused to the City's water system shall be immediately reported to the Engineer.

Damage caused to the City's water system by Contractor's operations shall be repaired by the Contractor at Contractor's sole expense in a manner satisfactory to the City of Santa Rosa Water Department. Such repairs shall not be charged to the City or any City project. All repair work shall be witnessed and approved by the City of Santa Rosa Water Department prior to backfilling the excavation. The City will require re-excavation if backfilling occurs prior to inspection, which costs shall be borne by Contractor.

Contractor is responsible for, at its sole cost and expense, the repair and remediation of damage to property and facilities caused by any of the following circumstances:

a. Contractor fails to make a written request for a markout or begins excavation without providing the City of Santa Rosa Water Department a reasonable opportunity to mark facilities;
b. Contractor destroys markouts;
c. Contractor fails to perform hand digging or probing for utilities near markouts; or
d. Contractor fails to use reasonable caution, regardless of whether markouts are present or clear. Reasonable caution includes any efforts to avoid damaging existing facilities, such as when excavating in the vicinity of water mains.

City may, in its discretion, opt to make the repairs for which Contractor is responsible with its own forces. In such cases, the repairs will be made at Contractor's expense in accordance with the emergency repair rate schedule of the City of Santa Rosa Water Department. The City may make repairs whenever restoration of service requires extraordinary speed or special equipment. Contractor will be billed accordingly and City shall have the right and option to withhold payment hereunder, or a portion thereof, for any such costs billed but not promptly paid by Contractor.

6-4.02 Salvage: All valves, hydrants, and other appurtenances of the water system that are the property of City and removed by Contractor shall be delivered to the City's Municipal Services Center (55 Stony Point Road) unless Contractor has obtained specific written approval from the City of Santa Rosa Water Department to otherwise dispose of the materials.

6-4.03 Trade Names and Alternatives: Unless otherwise specified, material and equipment specifications that identify a particular patent, trade name or manufacturer, may be satisfied through substitute materials and equipment accepted by the City. Contractor may offer substitute materials and equipment of equal or better quality y to the City. Any such offer shall be made in writing to the Engineer at least four weeks in advance of the time Contractor wishes to order the materials or equipment. Contractor shall include sufficient data which, together with any other information the Engineer may require, will enable the Engineer to determine the acceptability of the materials and equipment. When the substitute materials or equipment necessitate changes to any part of the work, the information shall include drawings and details showing all such changes and Contractor shall perform these changes as a part of any acceptance of substitute materials or equipment. The use of substituted materials and equipment will be permitted only after written acceptance of the materials and equipment by the Engineer. Such acceptance shall not relieve the Contractor from full responsibility for the sufficiency, quality and performance of the substitute materials and equipment.

The City will not, under any circumstances, acknowledge or consider any offers to accept substitute materials or equipment between the dates of public notice of advertisement and the bid opening.

7 LEGAL RELATIONS AND RESPONSIBILITY TO THE PUBLIC

7-1.02A(1) Forfeitures for Health and Safety Violations: Contractor shall comply with all applicable provisions of the Santa Rosa City Code and any failure to do so shall constitute a breach of the Contract. In the event of any violation of the Santa Rosa City Code that may impact public health and safety, including, but not limited to Chapter 17-12, "Storm Water" and Chapter 13-04, "Street Encroachments," City shall have the right to impose a charge against Contractor in an amount equal to $500.00 per violation per day. Prior to the imposition of any charge hereunder, City shall first provide a written notice to Contractor of the violation and setting forth a reasonable period of time for Contractor to cure the violation(s). In the event Contractor fails to cure any such violation within the time provided, City shall have the right, in addition to all other rights and remedies available to City, to deduct and withhold as a permanent forfeiture by Contractor the appropriate amounts from any payment otherwise due Contractor under this Contract.

7-1.02K(2) Wages: Pursuant to Labor Code sections 1770 *et seq*., each laborer or mechanic of Contractor or any subcontractor engaged in work on the project under this contract shall be paid not less than the hourly wage rate of per diem wages set forth in the prevailing wage rate schedule published by the Director of Industrial Relations, regardless of any contractual relationship which may be alleged to exist between Contractor or any subcontractor and such laborers and mechanics. A copy of the schedule of prevailing wage rates can be obtained online at www.dir.ca.gov or from the Department of Transportation and Public Works at 69 Stony Circle, Santa Rosa.

Any laborer or mechanic employed to perform work on the public works project under this Contract, which work is not covered by any of the foregoing classifications, shall be paid not less than the prevailing wage rate of per diem wages specified herein for the classification which most nearly corresponds to the work to be performed by the worker.

The foregoing specified prevailing wage rates are minimum rates only, and Contractor may pay any wage rate in excess of the applicable rate.

Pursuant to Labor Code Section 1775, Contractor as a penalty to the owner shall forfeit not more than $200.00 for each calendar day, or a portion thereof, for each worker paid less than the prevailing wage rate established by the Department of Industrial Relations for such work or craft in which such worker is employed. The difference between such prevailing wage rates and the amount paid to each worker for each calendar day or portion thereof for which the worker was paid less than the prevailing wage rate shall be paid to each worker by Contractor.

Contractor shall only provide prevailing wage reports upon written request from City.

7-1.02K(4) Apprentices: Contractor agrees to comply with Chapter 1, Part 7, Division 2, sections 1777.5 *et seq*. of the California Labor Code. These sections require contractors and subcontractors to employ apprentices in apprenticeable occupations in a ratio of not less than one hour of apprentice work for each five hours of journeyman work (unless an exception is granted in accordance with Section 1777.5), and the contractors and subcontractors shall not discriminate among otherwise qualified employees as apprentices solely on the ground of sex, race, religion, creed, national origin, ancestry, or color. Only apprentices as defined in Labor Code section 3077, who are in training under apprenticeship standards and who have written apprentice agreements will be employed on public works in apprenticeable occupations. The responsibility for compliance with these provisions is fixed with the prime contractor for all apprenticeable occupations.

7-1.02K(6)(a)(1) Notice to Vendors: Attention is directed to the current OSHA Standards. All equipment, tools and materials which are furnished and/or installed as part of this Contract shall meet or exceed the aforementioned standards in order to be considered acceptable.

7-1.02K(6)(b) Excavation Safety: When the digging or excavation occurs during project construction, Contractor shall:

a. Promptly notify City in writing of the following conditions before any such conditions are disturbed:

    1. Material that the Contractor believes may be hazardous waste as defined in Health and Safety Code section 25117 that is required to be removed to a Class I, Class II or Class III disposal site in accordance with provisions of existing law;
    2. Subsurface or latent physical conditions at the site differing from those indicated in the Invitation for Bids; and
    3. Physical conditions at the site of any unusual nature, materially different from those ordinarily encountered and generally recognized as inherent in the type of work under the Contract.

b. The City will investigate the conditions and will issue a change order under the terms of the Contract if it finds that the conditions warrant it.

c. If a dispute arises between City and Contractor as to whether a change order is warranted, Contractor shall not be excused from any scheduled completion date provided for in the Contract, but shall proceed with all work to be performed under the Contract.

7-1.02K(6)(b)(1) Trench Excavation Safety Plans: When the estimated cost for the excavation of any trench or trenches five feet or more in depth will exceed $25,000.00, Contractor shall submit to the Engineer in advance of excavation a detailed plan showing the design of shoring, bracing, sloping or other provisions to be made for worker protection from the hazard of caving ground during the excavation of such trench or trenches. If such plan varies from the shoring system standards established by the construction safety orders, or if the trench is anticipated to be greater than 20 feet, the plan shall be prepared by a registered civil or structural engineer.

A permit to do the above described work shall be obtained from the State of California, Division of Industrial Safety. Proof of such permit shall be submitted to the Engineer prior to starting the trench work.

Full compensation for complying with the provisions of this section shall be considered as included in the Contract price and no additional allowance will be made for the work.

7-1.02K(6)(d) Confined Space Safety: Any confined space entry for this project, including but not limited to manhole or water storage tank entry, will require a confined space entry permit pursuant to Cal/OSHA regulations as set forth in title 8 California Code of Regulations (CCR) sections 5157 or 5158. Confined space entry shall have the meaning ascribed in title 8 CCR sections 5157 and 5158. For any confined space entry for construction operations regulated by title 8 CCR section 1502, Contractor shall comply with title 8 CCR section 5158, “Other Confined Space Operations.” For any other confined space operations, Contractor shall comply with title 8 CCR section 5157, “Permit-Required Confined Spaces.”

Attention is directed to the technical specifications in the Special Provisions for information regarding entry to any City maintained confined space. Pursuant to title 8 CCR section 5157, Contractor is required to obtain any available information regarding hazards and operations for any City maintained confined spaces. The City maintained Confined Space Entry Manual is available

for viewing at the City of Santa Rosa Water Department or Transportation and Public Works Department office at 69 Stony Circle, Santa Rosa.

Contractor shall immediately inform the Engineer of any previously unidentified hazards confronted or created during confined space entry.

7-1.02L(2)(a) Patents and Royalties: All fees, royalties, or claims for any patented invention, article, process or method that may be used upon or in any manner connected with the work under this Contract shall be paid by Contractor. Contractor and its sureties shall protect and hold harmless City and its officers, agents, and employees from any and all demands made for such fees royalties or claims brought or made by any third party, and before the final payment is made on the account of the Contract, Contractor shall, if requested by City, furnish acceptable proof of a proper release from all such claims and liabilities.

Should Contractor, its officers, agents, or employees, or any one of them be enjoined from furnishing or using any invention, article, material, or plans supplied or required to be supplied or used under the Contract, Contractor shall promptly substitute other articles, materials, or appliances in lieu thereof of equal efficiency, quality, finish, suitability, and market value, and satisfactory in all respects to the Engineer. In the event that the Engineer elects, in lieu of such substitution, to have supplied and to retain and use any such invention, article, materials, or plans as may be required to be supplied by the Contract, Contractor shall pay such royalties and secure such valid licenses as may be requisite and necessary for City, its officers, agents, and employees, or any one of them to use such invention, article, materials, or appliance without being disturbed or in any way interfered with by any proceeding in law of equity on account thereof. Should Contractor neglect or refuse to make the substitution promptly or to pay such royalties and secure such licenses as may be necessary, then in that event the Engineer shall have the right to make such substitutions or City may pay such royalties and secure such licenses and charge Contractor even though final payment under the Contract may have been made.

7-1.02M(3) Mined Materials: California Public Contract Code section 20676 prohibits surface mining operators which are subject to the Surface Mining and Reclamation Act of 1975 (SMARA) from selling California mined construction material to the City unless the operator is identified in a list referred as the **3098 List**. The List, which is maintained by the Department of Conservation's Office of Mine Reclamation (OMR), changes throughout the year and can be viewed at the OMR website: http://www.consrv.ca.gov/OMR/ab_3098_list/index.htm. To confirm whether or not a specific operator is on the List at any given time, Contractor shall call the OMR at (916)323-9198.

7-1.03A Maintaining Traffic: Attention is directed to Sections 7-1.04 of the Standard Specifications and to the following modifications thereof.

If construction is within City owned right-of-way, provisions shall be made for the safe passage of public traffic through the work site at all times consistent with the requirements of Santa Rosa City Code Chapter 13-04.

Except for projects to be performed under a minor contract, Contractor shall install and maintain project identification signs at each end of the project or as directed by the Engineer two weeks prior to any construction activity. City shall furnish the appropriate sign panels upon request from Contractor. To mount the sign panels, Contractor shall furnish and install 4" X 4" posts or mount by other appropriate methods as approved by the Engineer. These sign panels shall be returned to the City Corporation Yard at 55 Stony Point Road after completion of the project.

Two weeks prior to any construction activity, advance notice signs for road closures shall be furnished and installed by Contractor at each end of the project and shall remain in place throughout the duration of the subject closure. Details of panel construction and lettering shall be approved by the Engineer.

Contractor shall furnish, install, and maintain at its expense all barricades, signs, lights, and other devices necessary to adequately warn of any obstructions to the traveled and pedestrian way and provide flaggers as necessary for the safety of public traffic and pedestrians and to provide access to property adjacent to the work site and Contractor shall comply with the Americans with Disabilities Act of 1990 (42 U.S.C. 12101, *et seq*.) (ADA) and any regulations and guidelines issued pursuant to the ADA.

Contractor shall comply with the current edition of the California Manual of Uniform Traffic Control Devices (CA MUTCD) for all items related to traffic within the work site.

Rain and other occurrences that may cause the suspension or delay of the work shall in no way relieve Contractor of its responsibility to provide traffic control and public access through the work site as specified herein. At all times, Contractor shall keep at the work site such materials, forces and equipment as may be necessary to keep roads, streets, and driveways within the work site open to traffic and in good repair and shall expedite the passage of such traffic, using such forces and equipment as may be necessary.

Should Contractor fail, in the opinion of the Engineer, to provide all the materials, forces and equipment necessary to maintain traffic through the work site as set forth herein, City may take steps necessary to remedy any such failure, including but not limited to causing such work to be performed and/or suspending any further work under the Contract. Any such remedial cost and expense incurred by the City, plus an administrative charge of 15%, shall be immediately due and payable by Contractor and may be deducted from any amounts owed to Contractor hereunder. In the event there are insufficient sums owed to Contractor hereunder to cover the foregoing costs and charges, City shall have the right to pursue any other remedy to recover the same, including but not limited to, proceeding against any surety or bond in favor of City. City's rights under Section 7-1.02 are intended to be in addition to and not in lieu of any charges imposed by City against Contractor under Section 7-1.02A(1) above for violations of the Santa Rosa City Code.

Contractor shall be responsible for informing emergency response agencies operating within the area of the work of obstructions to either public or private roads caused by reason of Contractor's operations hereunder.

Contractor shall make provisions for the safe passage of pedestrians around the project work site at all times.

8 PROSECUTION AND PROGRESS

8-1.01A Assignments: Once awarded, this Contract shall not be transferred, assigned, or sub-contracted, except as herein expressly provided without the prior written consent of the City in the City's sole and absolute discretion. See Section 5-1.12 of the Standard Specifications.

8-1.04B Standard Start: Contractor shall begin work within ten calendar days after the date authorized in the Notice to Proceed and shall diligently prosecute the Contract to completion before the expiration of:

30 WORKING DAYS

8-1.05 Time: Working days will be counted beginning with the day the Contractor begins work or with the tenth day after the date authorized in the Notice to Proceed, whichever occurs first.

Unless otherwise directed by Engineer, Contractor shall not conduct any activities that generate noise earlier than 7:00 a.m. or later than 7:00 p.m.

City offices are closed every other Friday. However, materials testing, survey, water system and inspection services will be provided on those days (except holidays). Any additional costs that may be associated with office closure on every other Friday shall be the sole responsibility of Contractor and no additional compensation shall be allowed therefor.

8-1.10 Liquidated Damages: Contractor hereby agrees that Contractor shall pay to the City liquidated damages for each and every calendar day delay over and above the number of working days prescribed above for finishing the work in the amount shown in Section 8-1.10 of the Standard Specifications.

9 MEASUREMENT AND PAYMENT

9-1.04 Force Account Work: All work done on a force account basis shall be recorded daily on report sheets prepared by Contractor and signed by both the Engineer and Contractor. Such reports shall thereafter be considered the true record of force account work performed during the project. Such reports shall be furnished to the Engineer and a copy retained by Contractor.

All extensions of labor, equipment, and material costs shall be completed by Contractor and submitted to the Engineer within 30 days of the completion of the extra work. Completed and extended extra work reports received later than the times herein prescribed may be deemed invalid and rejected without payment at the discretion of the Engineer.

9-1.07 Payment Adjustments For Price Index Fluctuations: Any references to Opt Out of Payment Adjustments for Price Index Fluctuations in the Standard Specifications are deleted in their entirety.

9-1.16 Progress Payments – Major Contracts: Once each month for progress pay purposes for "major contracts" as defined in Santa Rosa City Code section 3.44-020, the City will prepare a written estimate of the total amount of completed work and accepted materials purchased by Contractor but not installed. The City shall retain five percent of such estimated value of the completed work and the unused materials and pay Contractor the balance after deducting all previous payments and all sums to be retained under the provisions of the Contract. No such estimate or payment shall be required to be made when, in the judgment of the Engineer, the work is not proceeding in accordance with the provisions of the Contract or when, in the Engineer's judgment, the total value of the completed work since the last estimate is less than $500.00. No such estimate or payment shall be construed to be an acceptance of any defective work or improper materials.

After Contract acceptance, the Engineer will prepare a written proposed final estimate of the proposed final quantities of work completed under the Contract and the value of such work and will submit such estimate to Contractor. The City shall retain five percent of such estimated value of the work done and shall pay to Contractor the balance after deducting all amounts to be retained under the provisions of the Contract.

The City may, at its option and at any time, retain out of any amounts due Contractor sums sufficient to cover any unpaid claims of City or others, provided that sworn statements of all non-City claims shall have been filed with the Director of Finance.

9-1.16E(6) Substitution of Securities for Withheld Amounts: Pursuant to Public Contract Code section 22300, securities may be substituted for any moneys withheld by City to ensure performance under this Contract, provided that substitution of securities provisions shall not be required in contracts in which there will be financing provided by the Farmer's Home Administration of the United States Department of Agriculture pursuant to the Consolidated Farm and Rural Development Act (7 USC sections 1921 *et seq*.), and where federal regulations or policies or both do not allow the substitution of securities. At the request and expense of Contractor, securities equivalent to the amount withheld shall be deposited with the City, or with a state or federally chartered bank as the escrow agent, which shall then pay such moneys to Contractor. The Director of Finance is authorized to execute substitution of securities agreements on behalf of the City. The City will return the securities to Contractor upon satisfactory completion of the Contract as determined by City in its sole discretion and the resolution of all outstanding claims against the securities. Contractor shall be the beneficial owner of any securities substituted for moneys withheld and shall receive any interest thereon.

Securities eligible for investment under this section shall include those listed in Government Code section 16430, bank or savings and loan certificates of deposit, interest bearing demand deposit accounts, standby letters of credit or any other security mutually agreed to by Contractor and the City, provided that the substituted security is equal to or not less than five percent of the Contract amount.

Security substitutions must be submitted by Contractor and approved by City prior to the time of the first progress payment to be made under the Contract. No other method of substituting securities for retention will be accepted. The security substitution shall be done only upon execution of an agreement satisfactory to City which includes the following provisions:

a. The amount of securities to be deposited;
b. The terms and conditions of conversion to cash in case of the default of Contractor; and
c. The procedure for return of securities upon completion of the Contract.

9-1.17D Final Payment and Claims: The processing of payment of the final estimate shall not be commenced less than 35 days after the date of recording of the Notice of Completion with the County Recorder's Office. Contractor is advised that it takes approximately ten days for a check to be issued following a request for payment.

Contractor shall submit its written statement of all claims for additional compensation under the Contract to the Engineer within 15 days after submission to Contractor of the proposed final estimate.

If Contractor does not file a claim within the 15 day period, or upon Contractor's approval, the Engineer will issue a final written estimate and the City shall pay to Contractor the entire sum due after deducting all previous payments, if any, and all amounts to be retained under the provisions of the Contract.

If Contractor files a claim within the 15 day period, the Engineer will furnish a semi-final estimate and pay the amount due under the semi-final estimate within 30 days. The semi-final estimate is conclusive as to the amount payable except as may be affected by claims and any amount retained. The Engineer shall then consider and investigate such claim, and shall make such revision in the final quantities as the Engineer may find to be due, and shall then make and issue a final written estimate. The City will pay the amount due, after deducting all previous payments, if any, and amounts to be retained under the provisions of the Contract.

Any and all prior partial estimates and payments shall be subject to correction in the final estimate and payment.

The final estimate shall be conclusive and binding against both parties to the Contract on all questions relating to the performance of the Contract and the amount of work done thereunder and compensation therefor, except in the case of gross error.

9-1.17D(3) Final Determination of Claims: Claims filed by Contractor shall be in sufficient detail to enable the Engineer to determine the basis and amount of the claims. If additional information is required by the Engineer, Contractor shall provide such information to the Engineer no later than the 15th day after receipt of the written request from the Engineer. If the 15th day falls on a weekend, holiday, or day City offices are closed, then the information shall be provided to the Engineer no later than close of the next business day. Failure to submit the requested information to the Engineer within the time specified will be sufficient cause for denying the claim.

Contractor shall keep full and complete records of the costs and additional time incurred for any work for which a claim for additional compensation is made. The Engineer or any designated claim investigator or auditor shall have access to those records and any other records as may be required

by the Engineer to determine the facts or contentions in the claims. Failure to grant access to such records shall be sufficient cause for denying the claims.

Claims submitted by Contractor shall be accompanied by a notarized certificate containing the following language:

Under the penalty of law for perjury or falsification and with specific reference to the California False Claims Act, Government Code sections 12650 *et seq*., the undersigned,

_____,
(Name)

_____ of
(Title)

_____
(Contractor)

hereby certifies that the claim for additional compensation made herein is supported by a true statement of the actual costs incurred and time expended on this project, and is fully documented by records maintained by Contractor.

Dated _____

/s/_____

Subscribed and sworn before me this _____ day of

_____

_____
Notary Public

My Commission Expires _____

Failure to submit the notarized certificate will be sufficient cause for denying the claim.

Any claim for overhead expenses, in addition to being certified as stated above, shall be supported by an audit report of an independent Certified Public Accountant. Any such overhead claim shall also be subject to audit by the City at its discretion.

Any costs or expenses incurred by the City in reviewing or auditing any claims that are not supported by Contractor's cost accounting or other records shall be deemed to be damages incurred by the City within the meaning of the California False Claims Act.

City of Santa Rosa

TECHNICAL SPECIFICATIONS

FOR
LAGUNA TREATMENT PLANT
MAINTENANCE BUILDING OFFICE EXPANSION

CONTRACT NUMBER
C01889

March 2017

Doug Hilberman, AIA

3-14-17
Date:

LICENSED ARCHITECT
DOUGLAS M. HILBERMAN
No. C29543
REN. 10-31-17
STATE OF CALIFORNIA

AXIA Project No.: 904

AXIA
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250 D Street, Suite 210, Santa Rosa CA 95404
707-542-4652 www.axiaarchitects.com

SECTION 01 1100

SUMMARY OF WORK

PART 1GENERAL

1.01 SECTION INCLUDES

A. Work covered by Contract Documents.

B. Work under separate contracts.

C. Execution, correlation and intent.

D. Acceptance of site.

E. Related documents.

F. Contractor's use of premises.

G. Access.

H. Existing conditions.

1.02 WORK COVERED BY CONTRACT DOCUMENTS

A. Project name is Laguna Treatment Plant Maintenance Building Office Expansion as shown on Contract Documents prepared by AXIA Architects and briefly described as:
   1. Construction of Office Expansion onto the north side of the existing Maintenance Building, including related access compliance related work at the Unisex Restroom, Women's Restroom in the Administration Building, and various other required access compliance upgrades.

B. The Work shall be constructed under single lump sum Contract.

C. The Work of the Contract includes but is not necessarily limited to:
   1. Site minor Clearing and Grading, Selective Demolition.
   2. Construction phasing and barricading of work areas as required to separate construction areas from occupied spaces and as needed to accommodate the Owner's schedule and use of the site.
   3. All other work as shown in the Contract Documents.
   4. The Work includes all labor, materials and equipment necessary for the Contractor to fulfill all of its obligations pursuant to the Contract Documents, including but not limited to:
      a. Home office overhead,
      b. Off-Site supervision,
      c. Project Administration including preparation, research and distribution of project correspondence and submittals,
      d. Schedule preparation and maintenance,
      e. Guarantees and warranties,
      f. On-Site supervision,
      g. Temporary protection,
      h. Temporary utilities and facilities, including mobilization and demobilization,
      i. Material handling and storage,
      j. Safety equipment,
      k. Travel time to and from the Site to the Contractor's home office.

D. Sequence the Work subject to the Owner's use of the site, the requirements of the Construction Phasing, Technical Specifications and the Contract provisions for Liquidated Damages found elsewhere in these documents.

E. Provide materials and perform work indicated or required to produce finished results shown.

F. Contractor shall coordinate all work and shall be responsible for division of work among the various subcontractors.
   1. Coordinate the work of this Contract with the activities of the Owner.

2. Coordinate the work of this Contract with the activities of the Owner's separate contractors, including those for removal or abatement of Hazardous Materials.

G. Laws and Regulations: Intent of the Contract Documents is to construct the Work shown therein, in accordance with applicable codes and regulations.

1.03 NOT USED.

1.04 NOT USED.

1.05 NOT USED.

1.06 RELATED DOCUMENTS

A. The Drawings and general provisions of the Contact, including General and Supplementary Conditions and other Division 01 specifications apply to the Work of this Section.

B. The Drawings, General provisions of the Contact, including General and Supplementary Conditions and other Division 01 specifications apply to the Work of all specifications sections as if specifically reproduced therein.

C. Specification Section Numbering: The Contract Documents may indicate section numbering utilizing both MasterFormat 1995 numbering and MasterFormat 2004 numbering.

1.07 CONTRACTOR'S USE OF PREMISES

A. Confine operations on the site to areas indicated in the Contract Documents. Portions of the site beyond areas on which work is indicated are not to be disturbed. Conform to site rules and regulations affecting the Work while engaged in project construction.

B. Contractor shall limit his use of the premises for work and storage to allow for work by other contractors.

C. Maintain existing driveways and entrances serving the premises clear and available to the Owner and his employees at all times. Do not use these areas for parking or storage of materials.

D. Do not unreasonably encumber the site with materials or equipment. Confine stockpiling of materials and location of storage sheds to area approved by the Architect. If additional storage is necessary, Contractor shall obtain and pay for such storage off site without additional expense to the Owner.

E. Do not overload structures with weight that will endanger them.

F. Assume full responsibility for protection and safekeeping of materials and tools stored at the site. Lock vehicles such as passenger cars and trucks and other mechanized or motorized construction equipment, when parked and unattended to prevent unauthorized use. Do not leave such vehicles or equipment unattended with the motor running or the ignition key in place.

G. Move stored products, temporary facilities, controls or fencing, under Contractor's control, which interfere with operations of the Owner or separate contractors, on or off the site, without cost to the Owner.

H. Minimize disturbance caused by the work. Cooperate with Owner and governing authorities, observe all local ordinances for timing of work.

I. Perform site access activities, including arrival and departure of workers, deliveries, storing, handling and removal of materials, equipment, and debris to minimize dust, mud or accumulated debris, or undue interference with the convenience, sanitation or routine of Owner's activities.

J. Time and coordinate cutovers and connection of new utilities to existing systems and other similar activities to avoid interference with or interruption of Owner's activities.

K. Protect improvements on adjoining properties as well as those on the Owner's property.

L. Restore all improvements damaged by this work to their original condition as acceptable to

the owner of the improvement

M. Contractor is responsible for safety and support of structures. Cease operations and notify Architect immediately if safety of structure appears to be endangered. Take precautions to properly support structure. Do not resume operations until safety is restored. Contractor shall assume liability for such movement, settlement, damage or injury.

N. Provide, erect and maintain barricades and guard rails as required by governing regulatory agencies to protect occupants of building and workers. Refer to other pertinent sections of Division 01.

O. Protect existing finished work remaining in place from damage due to construction activities. Repair and replace finished work damaged by activities of this contract to the satisfaction of Owner and Architect at no extra cost to the Owner.

1.08 OWNER'S USE OF THE SITE

A. Owner will remain in continuous occupancy of the site. Owner reserves the right to limit hours of construction access and deliveries to avoid traffic conflicts during peak periods.

B. Certain on and off-site work will be performed by others. A portion of this work, including the completion of preceding contracts, may be constructed concurrently with this Contract. The Owner may have various additional contracts for other projects from time-to- time on the site concurrent with this Contract.

C. Owner's Use of Concurrent or Related Contracts: The Owner may occupy certain portions of the work of other contracts listed above prior to the completion of the work of this Contract. Make all allowances and include all sums necessary in the Bid Proposal to accommodate the Owner's occupancy of these neighboring areas.

1.09 ACCESS

A. Maintain free and safe access to the site and within the site to individual buildings as required by local fire marshal regulations, for fire-fighting equipment, ambulance and police vehicles. Maintain passage to and from adjacent buildings. Do not interfere with Owner's use of the site.
   1. Perform work and provision of temporary facilities and phasing of activities to minimize interference with adjacent facilities or new work areas. Minimize interference with activities of other contractors, the Owner's personnel or the public. Protect persons and property from harm. Maintain required accessways, and other accessways not required but so designated by the Owner or the Contract Documents, free with unrestricted passage.
   2. No utility service, such as water, gas, sewers, electricity, communication or fire protection system serving the project, or any part of it, shall be interrupted without prior written approval of the Owner.

B. Project Site is congested, with limited area available for access, storage and parking. Stage materials, schedule deliveries, arrange storage and provide off-site parking as required to limit effects of construction on the Owner's continuing use of the Site.

C. Areas designated by the Owner shall remain off-limits to construction personnel and equipment during construction. Relocate at own expense all vehicles, fencing, stored materials and temporary facilities as directed by the Owner.

1.10 NOT USED.

1.11 NOT USED.

PART 2PRODUCTS

2.01 NOT USED.

PART 3EXECUTION

3.01 NOT USED.

END OF SECTION

SECTION 01 2700
PROJECT FORMS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Project Forms for Administrative Procedures.

1.02 RELATED SECTIONS

A. Pertinent sections specifying General Requirements and Project Administration procedures, sections referencing this Section, or forms attached to this section.

B. Documents - Bidding Documents: Bond Forms, Insurance and other Certificates pertaining to Bidding and Procurement activities.

C. Document - Contract (Agreement Between Owner and Contractor). Contract Form.

D. Document - General Conditions: Bond Forms, Insurance and other Certificates, Guarantees, pertaining to Contract Requirements.

E. Pertinent sections specifying sustainability cost summaries, content and performance certifications and related forms.

1.03 SUBMITTALS

A. See Section 01-3300 - Submittals for submittal procedures.

B. Procedures for use of Project Forms are described in related sections.

PART 2 PRODUCTS

2.01 NOT USED.

PART 3 EXECUTION

3.01 SCHEDULE OF ATTACHMENTS FOLLOWING THIS SECTION

A. APPLICATION AND CERTIFICATE FOR PAYMENT G702

B. CONTINUATION SHEET G703

C. REQUEST FOR INFORMATION (RFI)

D. ARCHITECT'S SUPPLEMENTAL INSTRUCTIONS (ASI)

E. REQUEST FOR PROPOSAL (RFP)

F. SUBSTITUTION REQUEST FORM (RFS)

END OF SECTION

AI[illegible]LICATION AND CERTIFICATE FOR PAYME[illegible]

AIA DOCUMENT G702 (Instructions on reverse side) PAGE ONE OF [illegible]GES

TO OWNER:

PROJECT:

APPLICATION NO.:
PERIOD TO:
PROJECT NOS.:

Distribution to:
☐ OWNER
☐ ARCHITECT
☐ CONTRACTOR
☐
☐

FROM CONTRACTOR:

VIA ARCHITECT:

CONTRACT DATE:

CONTRACT FOR:

CONTRACTOR'S APPLICATION FOR PAYMENT

Application is made for payment, as shown below, in connection with the Contract. Continuation Sheet, AIA Document G703, is attached.

1. **ORIGINAL CONTRACT SUM** . . . . . $_____
2. **Net change by Change Orders** . . . . . $_____
3. **CONTRACT SUM TO DATE** (Line 1 ± 2) . . . . . $_____
4. **TOTAL COMPLETED & STORED TO DATE** . . . . . $_____
   (Column G on G703)
5. **RETAINAGE:**
   a. _____% of Completed Work $_____
   (Columns D + E on G703)
   b. _____% of Stored Material $_____
   (Column F on G703)
   Total Retainage (Line 5a + 5b or
   Total in Column I of G703) . . . . . $_____
6. **TOTAL EARNED LESS RETAINAGE** . . . . . $_____
   (Line 4 less Line 5 Total)
7. **LESS PREVIOUS CERTIFICATES FOR PAYMENT**
   (Line 6 from prior Certificate) . . . . . $_____
8. **CURRENT PAYMENT DUE** . . . . . $
9. **BALANCE TO FINISH, INCLUDING RETAINAGE**
   (Line 3 less Line 6) $_____

CHANGE ORDER SUMMARY	ADDITIONS	DEDUCTIONS
Total changes approved in previous months by Owner		
Total approved this Month		
TOTALS		
NET CHANGES by Change Order		

The undersigned Contractor certifies that to the best of the Contractor's knowledge, information and belief the Work covered by this Application for Payment has been completed in accordance with the Contract Documents, that all amounts have been paid by the Contractor for Work for which previous Certificates for Payment were issued and payments received from the Owner, and that current payment shown herein is now due.

CONTRACTOR:

By: _____ Date: _____

State of:
County of:
Subscribed and sworn to before
me this day of

Notary Public:
My Commission expires:

ARCHITECT'S CERTIFICATE FOR PAYMENT

In accordance with the Contract Documents, based on on-site observations and the data comprising this application, the Architect certifies to the Owner that to the best of the Architect's knowledge, information and belief the Work has progressed as indicated, the quality of the Work is in accordance with the Contract Documents, and the Contractor is entitled to payment of the AMOUNT CERTIFIED.

AMOUNT CERTIFIED . . . . . $_____

(Attach explanation if amount certified differs from the amount applied for. Initial all figures on this Application and on the Continuation Sheet that are changed to conform to the amount certified.)

ARCHITECT:

By: _____ Date: _____

This Certificate is not negotiable. The AMOUNT CERTIFIED is payable only to the Contractor named herein. Issuance, payment and acceptance of payment are without prejudice to any rights of the Owner or Contractor under this Contract.

CONTINUATION SHEET

AIA DOCUMENT G703 (Instructions on reverse side) PAGE OF PAGES

AIA Document G702, APPLICATION AND CERTIFICATE FOR PAYMENT, containing Contractor's signed Certification, is attached.
In tabulations below, amounts are stated to the nearest dollar.
Use Column I on Contracts where variable retainage for line items may apply.

APPLICATION NO.:
APPLICATION DATE:
PERIOD TO:
ARCHITECT'S PROJECT NO.:

A	B	C	D	E	F	G		H	I
ITEM NO.	DESCRIPTION OF WORK	SCHEDULED VALUE	WORK COMPLETED		MATERIALS PRESENTLY STORED (NOT IN D OR E)	TOTAL COMPLETED AND STORED TO DATE (D+E+F)	% (G ÷ C)	BALANCE TO FINISH (C - G)	RETAINAGE (IF VARIABLE) RATE)
			FROM PREVIOUS APPLICATION (D + E)	THIS PERIOD					

35

C01889

REQUEST FOR INFORMATION

PROJECT:		**CONTRACTOR:**		**R.F.I. No.**	
				Date:	
		Fax:		Arch. Project No.	
OWNER:		**ARCHITECT:**		Contract For:	
Fax:		Fax:			
RE TOPIC:		**INSPECTOR:**		Contr. Project No.	
		Fax:			

DRAWING/DETAIL REFERENCE: SPECIFICATION SECTION/PARAGRAPH:

REQUEST:

ATTACHMENTS: (list supporting documentation)

CONTRACTOR PROPOSED SOLUTION:

Signed By: Date:

RESPONSE:

ATTACHMENTS: (list supporting documentation)

Signed By: Date:

Copies To: Owner Inspector Consultant Construction Manager File

ARCHITECT'S SUPPLEMENTAL INSTRUCTIONS

PROJECT:		**CONTRACTOR:**		**ASI No.:**	
				Date:	
		Fax:		Arch. Project No.	
OWNER:		**ARCHITECT:**		Contract For:	
		Fax:			
Fax:		**INSPECTOR:**		Contr. Project No.	
		Fax:			

The Work shall be carried out in accordance with the following supplemental instructions issued in accordance with the Contract Documents without change in Contract Sum or Contract Time. Proceeding with the Work in accordance with these instructions indicates your acknowledgement of these instructions that there will be no change in the Contract Sum or Contract Time.

DESCRIPTION:

.

ATTACHMENTS: (list supporting documentation)

ISSUED BY:
AXIA Architects
Architect

Signed By: Date:

Copies To: Owner Inspector Consultant Construction Mgr File

REQUEST FOR PROPOSAL

PROJECT:		**CONTRACTOR:**		**RFP No.**	
				Date:	
		Fax:		Arch. Project No.	
OWNER:		**ARCHITECT:**		Contract For:	
		Fax:			
Fax:		**INSPECTOR:**		Contr. Project No.	
		Fax:			

THIS IS NOT A CHANGE ORDER NOR A DIRECTION TO PROCEED WITH THE WORK DESCRIBED.

- Submit an itemized proposal for changes in the Contract Sum or Contract Time for proposed modifications described below within ten (10) days of date written above, or notify the Architect in writing of the date proposal will be submitted, (not to exceed 30 days).

- Overtime or Premium time work is not authorized for this proposal unless specifically stated otherwise below.

CONDITIONS AND DISCLAIMER:

All proposals shall be subject to the following: The compensation (time and cost) set forth in response to this proposal comprises the total compensation due the Contractor, all Subcontractors and all Suppliers, at all tiers, for the work or change defined in the Proposal, including all impact on unchanged work. By submitting this proposal the Contractor acknowledges and agrees, on behalf of themselves, all Subcontractors and all Suppliers, at all tiers, that the stipulated compensation includes payment for all work contained in the proposal, plus all payment for the interruption of schedules, extended and unabsorbed overhead costs, delay, disruption, and all impact, ripple impact or cumulative impact on all other work under this Contract. The submittal of the proposal indicates that the proposal constitutes full mutual accord and satisfaction for the changed work, and that the time and cost under the proposal constitutes the total equitable adjustment owed the Contractor, all Subcontractors and all Suppliers, at all tiers, as a result of the proposal. The Contractor, on behalf of themselves, all Subcontractors and all Suppliers, at all tiers, agrees to waive all rights, without exception or reservation of any kind whatsoever to file any further claim related to this proposal. No further claim or request for equitable adjustment of any kind whatsoever shall arise out of or as a result of this change or the impact of this change on the remainder of the work under this Contract.

DESCRIPTION:

ATTACHMENTS: (list supporting documentation)

ISSUED BY:
AXIA Architects
Architect

Signed By: Date:

Copies To: Owner Inspector Consultant Construction Mgr File

SUBSTITUTION REQUEST FORM NO. _____

To: AXIA Architects, 250 D Street, Santa Rosa CA 95404, 707-542-3919 fax

Project: _____

We hereby submit for your consideration the following product instead of the specified item for the above project:

Section Paragraph Specified Item

_____

Proposed substitution:_____

Attach complete technical data, including laboratory tests, if applicable. Demonstrate compliance with all specified characteristics of specified item(s). Include complete description of all changes to Contract Documents required to implement proposed substitution. Fill in all blanks below and sign:

A. Does the substitution affect dimensions shown on the drawings?

_____

B. What affect does substitution have on other trades?

_____

C. Differences between proposed substitution and specified item?

_____

D. Manufacturer's guarantees of the proposed substitution and specified items are:

_____ Same _____ Different (explain on attachment)

The undersigned states that the function, appearance and quality are equivalent or superior to the specified item. The undersigned waives all claims for additional costs or time resulting from this substitution. The undersigned will pay for all changes to the building design, including engineering and detailing costs caused by the requested substitution.

Submitted by:_____ Date: _____

Signature

Firm Address/City/Zip Telephone

Remarks:_____

For use by Architect: ____ Accepted ____ Accepted as noted
____ Not accepted ____ Received too late

By _____ Date_____

SECTION 01 2900
PAYMENT PROCEDURES

PART 1GENERAL

1.01 DESCRIPTION

A. Payment Procedures:
   1. Schedule of Values.
   2. Applications for Payment.
   3. Conditions of Payment.
   4. Final Payment.
   5. Contractor Submittals.

B. Related Documents
   1. Document - Contract (Agreement Between Owner and Contractor): Lump Sum.
   2. Document - General Conditions: Progress Payments, Retainages and Final Payment., Applicability of Labor Compliance Program.
   3. City Labor Compliance Program, as applicable to the project.
   4. Section 01-1000 - Summary of Work.
   5. Section 01-3300 - Submittal Procedures.

1.02 SUBMITTALS

A. On forms approved by the Owner, the Contractor shall furnish the following:
   1. Within ten (10) days of the award of the Contract, a detailed breakdown of the Contract Price (Schedule of Values) for each Project or Site;
   2. Within ten (10) days of the award of the Contract, a schedule of estimated monthly payment requests (cash flow) due the Contractor showing the values and construction time of the various portions of the Work to be performed by it and by its Subcontractors or material and equipment suppliers containing such supporting evidence as to its correctness as the Owner may require;
   3. Within ten (10) days, the name, address, telephone number, fax number, license number, and classification of all of its Subcontractors and of all other parties furnishing labor, material, or equipment for its Contract, along with the amount of each such subcontract or the price of such labor, material, and equipment needed for its entire portion of the Work.
   4. Five (5) days prior to the submission of a pay request, an itemized breakdown of work done for the purpose of requesting partial payments;
   5. Five (5) days prior to the submission of a pay request, the minutes of Coordination Meetings per as specified in related section.
   6. Five (5) days prior to the submission of a pay request, updated Construction Progress Schedule as specified in related section.

B. Owner Approval Required:
   1. The Owner shall review all submissions received pursuant to this Section in a timely manner. All submissions must be approved by the Owner before becoming the basis of any payment.

C. Submit itemized applications typed on AIA Document G702 - Application and Certificate for Payment and G703 - Continuation Sheet.

D. Provide itemized data on continuation sheet:
   1. Format, schedules, line items and values: Those of the Schedule of Values accepted by Architect.

E. Obtain signature of Owner's Inspector on Form G703 with each application prior to submittal to Architect.

1.03 SCHEDULE OF VALUES

A. The Schedule of Values shall be used only as the basis for the Contractor’s Progress Payments.

B. Upon request of the Architect, support the values with data which will substantiate their correctness.

C. Correlate line items in the Schedule of Values with other required administrative schedules and forms, including:
   1. Contractor's construction schedule.
   2. Application for Payment form.
   3. List of subcontractors
   4. List of products.
   5. List of principal suppliers and fabricators.
   6. Schedule of submittals.

D. Form of Schedule: Submit schedule on Form G703. Identify schedule with;
   1. Title of Project and location, and name of Owner.
   2. Architect and Architect's Project Number.
   3. Name and address of Contractor.
   4. Contract designation.
   5. Date of submission.

E. Schedule shall list the installed value of the component parts of the Work in sufficient detail to serve as a basis for computing values for progress payments during construction. Modify detail as requested by Architect.

F. Follow the table of contents of this Project Manual as the form for listing component items.
   1. Identify each line item with the number and title of the respective section of the specifications.
   2. Include separate line items for each section of Division 01.

G. For each major line item which has installed value of more than $10,000.00, list sub-values of major products or operations under the item.

H. For the various portions of the Work:
   1. Itemize separate line item cost for each of following general cost items (if provided):
      a. Performance and payment bonds. b. Field supervision and layout.
      c. Temporary facilities and controls. d. Mobilization.
   2. Each item shall include a directly proportional amount of the Contractor's overhead and profit.
   3. For items on which progress payments will be requested for stored materials, break down the value into:
      a. The cost of the materials, delivered and unloaded, with taxes paid. b. The total installed value.

I. The sum of all values listed in the schedule shall equal the total Contract Sum.

1.04 NOT USED.

1.05 NOT USED.

1.06 NOT USED.

1.07 NOT USED.

1.08 NOT USED.

1.09 NOT USED.

1.10 NOT USED.

1.11 NOT USED.

PART 2 PRODUCTS

2.01 NOT USED.

PART 3 EXECUTION

3.01 PROJECT FORMS

A. Project Forms referenced in this section are bound following Section 01-2700.

END OF SECTION

SECTION 01 3300

SUBMITTAL PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Submittals required by the Contract Documents. Revise and re-submit as necessary to establish compliance with Contract Documents.
   1. Provide a satisfactory submittal by the second submittal. If repeated resubmittals are required, the Owner may backcharge the Contractor costs of review and processing unanticipated submittals.

B. Forward initial submittals to Architect for review within 15 days of Notice to Proceed.

1.02 WORK NOT INCLUDED

A. Submittals which are not required will not be reviewed by the Architect.

B. The Contractor may require subcontractors to provide drawings, setting diagrams or similar information as part of the coordination of the Work. The Architect will not review this data.

C. Material Safety Data Sheets (MSDS) - Limitation of Review: Certain Submittals require provision of these documents by the Contractor. These documents contain information necessary for operation of the facility. The Architect's review of these submittals is limited to noting inclusion of the document for the Owner's use. No further review or comment on MSDS documents by Architect shall be performed or inferred.

1.03 NOT USED.

1.04 QUALITY ASSURANCE

A. Submit to the Architect for review, product literature, samples and shop drawings as specified or required to fully describe every item proposed for incorporation in the work. Only approved items may be used.

B. Prior to submittal, review and coordinate all aspects of each item. Verify that each item and it's submittals conform to Contract Document requirements. Contractor assumes full responsibility for coordinating and verifying information, quantities and dimensions shown in submittals.

C. Submittals shall include:
   1. Date and revision dates.
   2. Project title and number.
   3. The names of:
      a. Architect/Engineer.
      b. Contractor.
      c. Subcontractor.
      d. Supplier.
      e. Manufacturer.
      f. Separate detailer when pertinent.
   4. Identification of product or material.
   5. Relation to adjacent structure or materials.
   6. Field dimensions, clearly identified as such.
   7. Specification section number.
   8. Applicable standards, such as ASTM number or Federal Specification.
   9. A blank space, 8 inches x 3 inches, for the Contractor and Architect stamps.
   10. Identification of deviations from Contract Documents.
   11. Contractor's stamp, initialed or signed, certifying to review of submittal, verification of field measurements and compliance with Contract Documents.

12. Signature of and calculations by an engineer, licensed in California, where required by specifications.

D. Indicate review and approval of each submittal prior to transmittal to Architect by affixing Contractor's stamp, initialed or signed, certifying:
   1. Review of submittal
   2. Verification of compliance with requirements of the Contract Documents.
   3. Verification of compatibility with other submittals, shop drawings, substitutions, and work of other trades.
   4. Coordination with existing job conditions and field construction criteria.
   5. Field verification of dimensions.

E. Architect will review Contractor's stamp language. Revise language in accordance with Architect's comments and provide new stamp if required by Architect.

F. Architect will return unreviewed any submittal not stamped by the Contractor in accordance with the above.

G. Direct Architect's attention to all deviations from the Contract Documents. Deviations not so noted shall be considered unreviewed.

H. Direct Architect's attention to any changes made in submittals other than those specifically requested by Architect. Changes not so noted shall be considered unreviewed.

I. Work shall not be fabricated, nor material shipped to project site prior to the distribution of approved submittals from the Architect.

1.05 SUBMITTALS

A. Make submittals of shop drawings, product data, samples, substitution requests, meeting minutes and other items required by the Contract Documents in accordance with the provisions of this Section.

B. Submittals shall include all technical and performance data necessary for the Architect to properly evaluate the submittal. Provide physical samples if requested by Architect, whether expressly specified or not.

C. Incomplete submittals will be return to the Contractor without review. Contractor shall be responsible for delays incurred by incomplete, multiple reviews or rejected submittals.

D. Provide only one make or brand of any product proposed.

E. Submit one electronic copy e-mailed to construction project manager.

F. Review Contract Documents and submit initial list of submittals to Architect with Preliminary Construction Schedule. Establish priority of initial submittals jointly with Architect, based on specified minimum review durations and expected lead times for fabrication and procurement.

G. Stagger submittals for items or products with shorter lead times, reduced coordination needs with other work, or which will be needed later in the construction schedule. Prioritize and coordinate submittals only according to jointly-agreed initial list. Items requiring longer lead times shall be submitted first.

PART 2PRODUCTS

2.01 SHOP DRAWINGS

A. Shop drawings are to be drawn at large scale, fully detailed and with all materials and stock or purchased components fully identified. Shop drawings are to be submitted when specified and to illustrate every custom fabricated item or assembly.
   1. Drawings in excess of 11 inches x 17 inches shall be submitted as specified in B. below.
   2. Drawings larger than 24 inches x 36 inches will be rejected and returned for re-formatting in smaller size. Architect will not review shop drawings larger than 24 inches by 36 inches. Select drawing scales accordingly.

B. Types of prints required:
   1. Submit shop drawings in PDF format, e-mailed to construction project manager.

C. Review comments will be made on the original which will be retained by Architect. Architect will make copies for distribution to the Owner and Inspector of Record as they require, and for the Contractor in electronic form. Initial submittal originals will not be returned.

D. Contractor shall accept reviewed submittals in the conditions delivered by the Architect. Architect reserves right to manage submittal review and stamping in any manner deemed expedient by the Architect and acceptable to the Owner and Authority Having Jurisdiction. These conditions of distribution may include, but not be limited to:
   1. Retention of all original documentation submitted and distribution of copies only, including original signatures of DSA review, other Authorities Having Jurisdiction, Contractor's Design Professionals.
   2. Stamping/signature of the cover page only, not each drawing, document or item submitted.
   3. Summarizing complex comments in the form of memo or summary notation, without copying or enumeration of each and every occurrence of a comment. Such copying and enumeration shall be performed by the Contractor.
   4. Conditional or limited degree of approval/acceptance such as "Color/Texture Only" and similar reservations.
   5. Contractor shall ensure that all reviewed Submittals are distributed intact with all comments, memos and attachments in place as received from the Architect. Owner nor Architect will not be responsible for errors due to failure to coordinate or record Architect or Engineer comments.

E. Identify each drawing with project name, the Owner's name and contract number, the Architect's name and job number, the Contractor's name and the specification section number and drawing detail reference number relating to the work shown.

2.02 PRODUCT DATA

A. Submit detailed technical literature fully describing every product or item proposed for use including manufacturers and items specified. Include manufacturer's detailed specifications, drawings, photographs, performance criteria, installation instructions, test data, samples of colors and finishes and other information required to fully describe the item.
   1. Modify standard product data to delete information which is not pertinent.
   2. Provide additional information which is specifically applicable.

B. Mark all submittals indicating items, options, and finishes proposed, and referencing project specification section and paragraph covering the work in question. Indicate as follows:
   1. Performance characteristics and capacities.
   2. Dimensions and/or clearances required.
   3. Wiring, piping and control diagrams.

2.03 CALCULATIONS

A. Calculations prepared by Contractor's Engineers justifying deferred design.
   1. Structural.
   2. As specified in technical sections.

B. Submit two copies initially, each with original stamp and signature of preparing engineer.

C. Requirements of preparing engineer: Valid license in California for specified discipline. For structural calculations, only licensed Structural Engineers shall provide these calculations. Designs by Civil Engineers will be rejected.

D. Revise and re-submit as required by Architect or Agency review.

E. Architect will not stamp, sign, distribute or return calculations.

2.04 SAMPLES

A. Provide samples identical to the precise article proposed, illustrating functional characteristics with all related parts and attachments. Indicate full range of color, textures and patterns.

B. Identify samples as described Article titled IDENTIFICATION OF SUBMITTALS below. Tag or label samples or transmit in bags or containers with tags and labels. Identify by specification section, submittal numbers and contract.

C. Submit number of samples as indicated above. Where samples of large complete items such as light fixtures, hardware, etc. are required, one sample will suffice.

D. Samples become the property of the Owner and may not be returned following review, at the Owner's option.

2.05 COLORS AND PATTERNS

A. Submit color and pattern selections for all products offering a choice of these attributes unless a specific color or pattern is referenced in the Contract Documents.

B. Submit within 35 days of Notice of Award a list of all required color selections organized by product, including manufacturer and model. Include samples of manufacturer's complete color range for all products.

C. Architect will not select colors or patterns until samples of all items requiring selections have been submitted. Architect will not make partial color selections.

D. Failure to submit all color selections as specified above, thus requiring additional unanticipated time for the Architect to make selections will not be basis for extension of Contract Time.

E. Architect will make color selections within 30 working days following complete submittal of samples. This period will commence with the receipt of the latest incremental submittal, as applicable.

F. Architect will issue Color Schedule.

PART 3EXECUTION

3.01 IDENTIFICATION OF SUBMITTALS

A. Number submittals consecutively. Refer to submittal by this number in subsequent correspondence and submittals.
   1. Transmit resubmittals under new cover. Use submittal number of original submittal with decimal numeric suffix. Increment suffix by one digit for each subsequent resubmittal of identical items (23.1, 47.2, etc.). Cite original submittal number for reference (i.e. 109).
   2. Do not transmit new submittals with decimal suffix.

B. Transmittal letter for each submittal shall show all information required for identification and checking.

C. Include submittal number on first page and elsewhere as required for identification.

D. Include table of contents on 1st page of each submittal.

E. Number each page in submittal consecutively.

F. Maintain log of submittals and status. Furnish copies to the Architect and Inspector upon request.

3.02 GROUPING OF SUBMITTALS

A. Transmit submittals in groups containing all associated items to ensure availability of information during review. Refer to more specific requirements in the technical divisions.

B. Do not submit partial submittals.

C. Incomplete or partial submittals may be returned for enhancement. No extension of time will be allowed for delays related to incomplete submittals.

3.03 SCHEDULING OF SUBMITTALS

A. Transmit submittals sufficiently in advance of installation for required review, revisions,

resubmittals and delivery. Include time required for transmittal by regular mail between the parties involved. No extension of time will be allowed for delays related to late submittals.

B. Deferred approval submittals are subject to long lead times. Schedule submittals accordingly.

3.04 ARCHITECT'S REVIEW OF SUBMITTALS

A. Submittals will be reviewed and stamped by the Architect "No exceptions taken," "Submit Specified Item" or "Make Corrections Noted" to indicate full or conditional approval or "Revise and Resubmit" or "Rejected" to indicate conditional or complete disapproval. Terms are defined as follows:
   1. No Exceptions Taken: Accepted subject to its compatibility with future submittals and additional partial submittals for portions of the work not covered in this submittal. Does not constitute approval or deletion of specified or required items not shown in the partial submittal.
   2. Submit Specified Item: Submit to the Architect the items indicated for review.
   3. Make Corrections Noted: Same as 1., except that minor corrections as noted shall be made by the Contractor. No resubmittal required.
   4. Revise and Resubmit: Rejected because of major inconsistencies or errors which shall be resolved or corrected by the Contractor prior to subsequent review by the Architect.
   5. Rejected: Submitted material does not conform to plans and specifications in major respect. For example, wrong size, model, capacity or material. Resubmit.
   6. Receipt Acknowledged. Received, recorded and distributed without further action.

B. Submittals reviewed by the Architect which have been stamped shall be deemed to have the following language affixed and made a part thereof, regardless of the initial or subsequent readability of the actual stamp.
   1. Corrections or comments made on submittals during this review do not relieve the contractor from compliance with the requirements of the drawings and specifications. This check is for review of general conformance with the design concept of the project and general compliance with information given in the Contract Documents. The contractor is responsible for confirming and correlating all quantities and dimensions, selection of fabrication processes and techniques of construction, coordinating the work of the trades; and performing the work in a safe and satisfactory manner.

C. Architect’s review of submittals shall be undertaken with reasonable promptness, while allowing sufficient time in the Architect’s professional judgement to permit adequate review.

D. Architect's review of submittals has, as a primary objective, to assist in the completion of the project on time and in conformance with the Contract requirements by permitting review of material and fabricated items prior to ordering. Architect's review of submittals is based only on the data presented and extends only to conformance with general design intent and information contained in the Contract Documents.

E. Architect's approval of submittals does not constitute final acceptance or unqualified approval of items or work proposed or put in place, nor does it constitute acceptance of responsibility for the accuracy, coordination or completeness of submittals. Architect's approval of submittals does not relieve the Contractor from the responsibility for errors, omissions, or compliance with all the requirements of the Contract Documents.

F. Reimbursement of the Architect's costs for review:
   1. Architect will record all time and expenses incurred to review submittals requiring more than two reviews.
   2. Contractor shall reimburse the Architect promptly upon receipt of the Architect's billing and that of the Architect's consultants at standard billing rates for all time and expenses incurred in unanticipated reviews.
   3. Upon failure of Contractor to reimburse Architect for such review, with the authorization of the Owner, amounts due the Architect will be deducted from amounts due the Contractor.

G. Architect's review of submittals does not change the Contract in any manner.

3.05 RESUBMITTAL

A. Make all corrections or revisions required by reviewer's comments at Contractor’s expense and resubmit as initially specified above. No additional costs will be authorized for corrections or revisions.

B. Product data and shop drawings:
   1. Revise initial drawings or data and resubmit as initially specified.
   2. Indicate changes which have been made other than those requested by

reviewer. C. Submit new samples as initially specified.

3.06 DISTRIBUTION

A. Distribute only submittals with Architect/Engineer stamps of review.
Contractor is responsible for coordination of submittals and comments following review. Contractor to provide all additional reproduction costs for copies required by the Contractor at his expense. No additional costs will be authorized for Contractor costs pertaining to submittals.

B. Architect will distribute submittals only to Inspector of Record and the Owner.

END OF SECTION

SECTION 01 4000

QUALITY REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Mock-ups.

B. Control of installation.

C. Tolerances.

D. Manufacturers' field services.

1.02 RELATED REQUIREMENTS

A. Section 014200 - References

B. Section 01 4523 - Testing and Inspection Services.

1.03 REFERENCE STANDARDS

A. ASTM C1077 - Standard Practice for Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation.

B. ASTM D3740 - Standard Practice for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.

C. ASTM E329 - Standard Specification for Agencies Engaged Construction Inspection and/or Testing.

D. ASTM E543 - Standard Specification for Agencies Performing Nondestructive Testing.

1.04 SUBMITTALS

A. Testing Agency Qualifications:
   1. Prior to start of Work, submit agency name, address, and telephone number, and names of full time registered Engineer and responsible officer.

B. Design Data: Submit for Architect's knowledge as contract administrator for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents, or for Owner's information.

C. Certificates: When specified in individual specification sections, submit certification by the manufacturer and Contractor or installation/application subcontractor to Architect, in quantities specified for Product Data.
   1. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
   2. Certificates may be recent or previous test results on material or product, but must be acceptable to Architect.

D. Manufacturer's Instructions: When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, for the Owner's information. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

E. Manufacturer's Field Reports: Submit reports for Architect's benefit as contract administrator or for Owner.
   1. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.

PART 2 PRODUCTS - NOT USED.

PART 3 EXECUTION

3.01 CONTROL OF INSTALLATION

A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.

B. Comply with manufacturers' instructions, including each step in sequence.

C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.

D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

E. Have Work performed by persons qualified to produce required and specified quality.

F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.

G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.

3.02 MOCK-UPS

A. Tests will be performed under provisions identified in this section and identified in the respective product specification sections.

B. Assemble and erect specified items with specified attachment and anchorage devices, flashings, seals, and finishes.

C. Accepted mock-ups shall be a comparison standard for the remaining Work.

D. Where mock-up has been accepted by Architect and is specified in product specification sections to be removed, remove mock-up and clear area when directed to do so.

3.03 TOLERANCES

A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.

B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Architect before proceeding.

C. Adjust products to appropriate dimensions; position before securing products in place.

3.04 TESTING AND INSPECTION

A. Testing Agency Duties:
   1. Test samples of mixes submitted by Contractor.
   2. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.
   3. Perform specified sampling and testing of products in accordance with specified standards.
   4. Ascertain compliance of materials and mixes with requirements of Contract Documents.
   5. Promptly notify Architect and Contractor of observed irregularities or non-conformance of Work or products.
   6. Perform additional tests and inspections required by Architect.
   7. Submit reports of all tests/inspections specified.

B. Limits on Testing/Inspection Agency Authority:
   1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
   2. Agency may not approve or accept any portion of the Work.
   3. Agency may not assume any duties of Contractor.
   4. Agency has no authority to stop the Work.

C. Contractor Responsibilities:
   1. Deliver to agency at designated location, adequate samples of materials proposed to be used that require testing, along with proposed mix designs.
   2. Cooperate with laboratory personnel, and provide access to the Work and to manufacturers' facilities.

3. Provide incidental labor and facilities:
    a. To provide access to Work to be tested/inspected.
    b. To obtain and handle samples at the site or at source of Products to be tested/inspected.
    c. To facilitate tests/inspections.
    d. To provide storage and curing of test samples.
4. Notify Architect and laboratory 24 hours prior to expected time for operations requiring testing/inspection services.
5. Employ services of an independent qualified testing laboratory and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
6. Arrange with Owner's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.

D. Re-testing required because of non-conformance to specified requirements shall be performed by the same agency on instructions by Architect.

E. Re-testing required because of non-conformance to specified requirements shall be paid for by Contractor.

3.05 MANUFACTURERS' FIELD SERVICES

A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust and balance of equipment as applicable, and to initiate instructions when necessary.

B. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

3.06 DEFECT ASSESSMENT

A. Replace Work or portions of the Work not conforming to specified requirements.

B. If, in the opinion of Architect, it is not practical to remove and replace the Work, Architect will direct an appropriate remedy or adjust payment.

END OF SECTION

SECTION 01 4100

REGULATORY REQUIREMENTS

PART 1 GENERAL

1.01 SUMMARY

A. Section includes: Regulatory authorities and codes.

1.02 AUTHORITIES HAVING JURISDICTION

A. Building Department: City of Santa Rosa.

B. Fire Department: Santa Rosa Fire Department

1.03 APPLICABLE CODES

A. California Code of Regulations (CCR), California Building Standards Code, CCR Title 24:
   1. Building code:
      a. California Building Code (CBC), Title 24, Part2 – 2013.
   2. Electrical Code:
      a. California Electrical Code (CEC), Title 24, Part 3 – 2013.
   3. Existing building Code:
      a. California Existing Building Code (CEBC), Title 24, Part 10 – 2013.
   4. Fire Code:
      a. California Fire Code (CFC), Title 24, Part 9 – 2013.
   5. Green building standards code:
      a. California Green Building Standards Code (Cal Green), Title 24, Part 11 – 2013.
   6. Historical building code:
      a. California Historical Building Code (CHBC), Title 24, Part 8 – 2013.
   7. Mechanical code:
      a. California Mechanical Code (CMC), Title 24, Part 4 – 2013.
   8. Plumbing code:
      a. California Plumbing Code (CPC), Title 24, Part 5 – 2013.
   9. Energy code:
      a. California Energy Code (CEC), Title 24, art 6 - 2013.

1.04 NOT USED.

PART 2 PRODUCTS - NOT USED.

PART 3 EXECUTION - NOT USED.

END OF SECTION

SECTION 01 4200
REFERENCES

PART 1 GENERAL

1.01 SUMMARY

A. General: This section specifies procedural and administrative requirements for compliance with governing regulations and the codes and standards imposed upon the work. These requirements include the obtaining of permits, licenses, inspections, releases and similar documentation, as well as payments, statements and similar requirements associated with regulations, codes, and standards.

1. "Regulations" is defined to include laws, statutes, ordinances and lawful orders issued by governing authorities, as well as those rules, conventions and agreements within the construction industry which effectively control the performance of the work regardless of whether they are lawfully imposed by governing authority or not.

B. Governing Regulations: Refer to General and Supplementary Conditions for requirements related to compliance with governing regulations.

1.02 RELATED DOCUMENTS

A. This section applies to all Contract Documents, Drawings, General and Supplementary Conditions and other Division 01 Specification sections and all technical specifications.

B. All Drawings and General and Supplementary Conditions and other Division 01 Specification sections, and every section of the specifications which lists or refers to a referenced standard.

1.03 REFERENCES

A. Construction Specifications Institute (CSI): MasterFormat "Master List of Numbers and Titles for the Construction Industry" 2014 editions.

B. Construction Specifications Institute (CSI): SectionFormat "A Recommended Format for Construction Specifications Section", 1997 edition.

1.04 DEFINITIONS

A. General Explanation: A substantial amount of specification language constitutes definitions for terms found in other contract documents, including the drawings. (Drawings shall be recognized as diagrammatic in nature and not completely descriptive of the requirements indicated thereon.) Certain terms used in contract documents may be defined in this article. Definitions and explanations of this section are not necessarily either complete or exclusive, but are general for the work to the extent they are not stated more explicitly in another element of contract documents.

B. General Requirements: The provisions or requirements of Division 01 sections apply to entire work of Contract and, where so indicated, to other elements which are included in project.

C. Indicated: A cross-reference to graphic representations, notes or schedules on drawings, to other paragraphs or schedules in the specifications, and to similar means of recording requirements in contract documents. Where terms such as "shown," "noted," "scheduled," and "specified" are used in lieu of "indicated," it is for purpose of helping reader locate cross-reference, and no limitation of location is intended except as specifically noted by direct reference.

C.1 Architect or Architect/Engineer or A/E: The person or firm holding a valid license to practice architecture or engineering which has been designated (if any designated) to provide architectural or engineering design services on this Project.

D. Directed, Requested, Etc.: Where not otherwise explained, terms such as "directed," "requested," "authorized," "selected," "approved," "required," "accepted," and "permitted" mean "directed by Architect/Engineer," "requested by "Architect/Engineer," and similar phrases. Such implied meaning shall not be interpreted to extend the Architect's/Engineer's responsibility into the Contractor's area of construction supervision or other duty of the Contractor enumerated in the Contract.

E. Approve: Where used in conjunction with Architect's/Engineer's response to submittals,

requests, applications, inquiries, reports and claims by Contractor, the meaning of term "approved" will be held to limitations of Architect's/Engineer's responsibilities and duties as specified in General and Supplementary Conditions. In no case will "approval" by Architect/Engineer be interpreted as a release of Contractor from responsibilities to fulfill requirements of contract documents.

F. Project Site: The term "project site" is defined as the space available to Contractor for performance of the work. The extent of project site is shown on the drawings, and may or may not be identical with the description of land upon which the project is to be built.

G. Furnish: Except as otherwise defined in greater detail, term "furnish" is used to mean supply and deliver to project site, ready for unloading, unpacking, assembly, installation, etc., as applicable in each instance.

H. Install: Except as otherwise defined in greater detail, term "install" is used to describe operations at project site including unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning and similar operations, as applicable in each instance.

I. Provide: Except as otherwise defined in greater detail, term "provide" means furnish and install, complete and ready for intended use, as applicable in each instance.

J. Installer: The entity (person or firm) engaged by Contractor, or its subcontractor or subcontractor for performance of a particular unit of work at the project site, including installation, erection, application and similar required operations. Such entities (installers) shall be expert in operations they are engaged to perform.

K. Testing Agency (or Laboratory): An independent entity engaged to perform specific inspections or tests of the work, either at project site or elsewhere; and to report and (if required) interpret results of those inspections or tests.

L. Products: Materials, systems and equipment.

M. Approved Equal, Or Equal: As approved and accepted by the Architect.

N. Shall: The term "shall" is mandatory.

O. As Required, As Necessary, etc.: Words of similar import mean "as required by the Contract Documents" or "essential to the completion of the Work" in the context of application.

P. Concealed: Embedded in masonry or other construction, installed within furred spaces, within double partitions or above suspended ceilings, in trenches, in crawl spaces, or in enclosures.

Q. Exposed: Not installed underground or "concealed" as defined above, including work and surfaces open in whole or in part to the exterior or weather.

R. Visible: Not "concealed", as defined above.

S. Work: Both labor and materials, and as defined below.

T. The Contract Documents:

1. The Contract Documents consist of the Contract, any addenda thereto, the completed Bid Form, the completed Bond and Insurance forms, the Notice Inviting Bids, the Instructions to Bidders, the General Conditions, the Supplementary General Conditions, the Labor Compliance Program, if any, the Technical Specifications, the Drawings and the Bidder's Questionnaire. All modification(s) amending or extending the work shall be as binding as if originally included in the Contract Documents. A Modification is a written amendment to the Contract signed by both parties, a Change Order, a Construction Change Directive, or a written order for a minor change in the Work issued by the Architect. The Contract Documents are complementary, and each obligation of the Contractor, Subcontractors, material or equipment suppliers in any one shall be binding as if specified in all.
2. The Contract:
    a. The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. The Contract may be amended or modified only by a written Modification. The Contract Documents

shall not be construed to create a contractual relationship of any kind between the Architect and Contractor, between the Owner and any Subcontractor or Sub-subcontractor, or between any persons or entities other than the Owner and the Contractor. The Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of the Architect's duties.

3. The Work:
    a. The Work shall include the initial obligation of any Contractor or Subcontractor, who performs any portion of the Work, to visit the Site of the proposed Work, a continuing obligation after the commencement of the Work to fully acquaint and familiarize itself with the conditions as they exist and the character of the operations to be carried on under the Contract Documents, and make such investigation as it may see fit so that it shall fully understand the facilities, physical conditions, and restrictions attending the Work under the Contract Documents. Each such Contractor or Subcontractor shall also thoroughly examine and become familiar with the Drawings, Specifications, and associated bid documents. The "Site" refers to the grounds of the Project as defined in the Contract Documents and such adjacent lands as may be directly affected by the performance of the Work.
4. The Project:
    a. The Project is the total construction of the Work performed in accordance with the Contract Documents in whole or in part and which may include construction by the Owner or by separate Contractors.
5. The Drawings:
    a. The Drawings are graphic and pictorial portions of the Contract Documents prepared for the Project and approved changes thereto, wherever located and whenever issued, showing the design, location, and scope of the Work, generally including plans, elevations, sections, details, schedules, and diagrams as drawn or approved by the Architect, in the full original size as initially issued, without reduction or enlargement, scanning, translation, or conversion to electronic or other data format.
6. The Specifications:
    a. The Specifications are that portion of the Contact Documents consisting of the written requirements for material, equipment, construction systems, instructions, quality assurance standards, workmanship, and performance of related services, as prepared or approved by the Architect, in the full original size as initially issued, without reduction or enlargement, scanning, translation, or conversion to electronic or other data format.
7. The Project Manual
    a. The Project Manual is the volume usually assembled for the Work which may include, without limitation, the bidding requirements, sample forms, Conditions of the Contract, and Specifications.

1.05 QUALITY ASSURANCE

A. For products or workmanship specified by reference to a document or documents not included in the Project Manual, also referred to as reference standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

B. Conform to reference standard of date of issue current on date of AHJ Approval, except where a specific date is established by applicable code.

C. Obtain copies of standards when required by the Contract Documents.
    1. Maintain copy at project site during submittals, planning, and progress of the specific work, until Substantial Completion.

D. Should specified reference standards conflict with Contract Documents, request clarification from the Architect before proceeding.

E. Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor those of the Architect shall be altered by the Contract Documents by mention or inference otherwise in any reference document.

1.06 FORMAT AND SPECIFICATION EXPLANATIONS

A. Format Explanation: The format of principal portions of these specifications is described in the following paragraphs. Although some portions of these specifications may not be in complete compliance with these formats, no particular significance will be attached to such compliance or non-compliance.
   1. Division: A standard category of construction specifications, as defined by CSI MasterFormat "Master List of Numbers and Titles for the Construction Industry" 2014 edition.
      a. The Division number or title does not limit meaning or content of a section, nor is fully descriptive of the requirements specified therein, nor is an integral part of the text.
      b. Division groupings consist of individual sections grouped together with other sections of similar or related work as delineated in MasterFormat and as determined at the Architect's option utilizing CSI MasterFormat as a guideline.
      c. Divisions do not correspond to, nor shall be construed to influence trade jurisdictions or assignment of a particular scope to a particular trade or subcontractor. The Contractor is obligated to construct all work as specified.
   2. Section: A portion of the specifications covering one or more segments of the total project, included in the Project Manual to meet project requirements. Each Section is a portion of a Division. Individual sections are grouped together with other sections of similar or related work groupings known as "divisions."
      a. Each section is identified by a 5 digit (1995 format) or a 6 digit (2004 format) number and descriptive title (name).
      b. The section number or title does not limit meaning or content of a section, nor is fully descriptive of the requirements specified therein, nor is an integral part of the text.
      c. The section numbers and titles are determined at the Architect's option, utilizing CSI MasterFormat as a guideline.
      d. Sections do not correspond to, nor shall be construed to influence trade jurisdictions or assignment of a particular scope to a particular trade or subcontractor. The Contractor is obligated to construct all work as specified.

C. Section and Document Numbering:
   1. Contract documents are generally numbered according to CSI MasterFormat "Master List of Numbers and Titles for the Construction Industry" 2014 edition. Numbers and titles are selected at the Architect's option and may vary from strict CSI format.
      a. MasterFormat 2014 recognizes use of additional digits beyond the initial grouping, separated by a period (.) delimiter. As a result, some sections may have numbers in excess of 5 or 6 digits, depending on the Architect's options for section numbering.
   3. Industry usage of these numbers and titles is in a transitional state following introduction of MasterFormat 2014 and the dual numbering of certain Sections in this Project Manual is an intentional act by the Architect intended to implement and facilitate this transition, not a typographical or other error.

D. Section Format: Each section of specifications has been subdivided into 3 "parts" (PART 1 - GENERAL, PART 2 - PRODUCTS and PART 3 - EXECUTION) to promote uniformity and convenience, in general accordance with CSI SectionFormat 1997 edition.
   1. Some sections may not require the use of all three parts and such omission is an intentional act of the Architect intended to reduce redundancy and promote clarity.
   2. Subdivision of a section into PARTS does not limit the meaning of, and are not an

integral part of text specifying requirements.

E. Subordination of Text: Portions of specification text are subordinated to other portions in the following manner (lowest level to highest):
   1. Indented (from left margin) paragraphs and lines of text are subordinate to preceding text which is not indented, or which is indented by a lesser amount.
   2. Paragraphs and lines of text are subordinate to sub-article titles, which are printed in upper/lower-case lettering.
   3. Sub-articles are the subordinate to article titles, which are printed in uppercase lettering.
   4. Subordination (if any) of certain sections (or portions of sections) to other sections is described within those sections.

F. Related Sections: Specification sections may list other sections of other divisions which may include work referenced in that section or otherwise related. This information is not part of the Specification Section, does not expand or limit the scope of the Section, or of the Contract Work and is provided at the Architect's sole option for the convenience of readers of the Contract Documents. No limitation of scope shall be inferred by the listing, or failure to list, any given section as related to any other given section and does not affect the Contractor's duty to coordinate and provide all work specified.

G. Underscoring, where used, is strictly to assist the reader of specification text in scanning text for key words (for quick recall). No emphasis on or relative importance of text is intended where underscoring is used.

H. Imperative language is used generally in specifications. Except as otherwise indicated, requirements expressed imperatively are to be performed by Contractor. At the option of the Architect and for clarity of reading at certain locations, contrasting subjective language may be used to describe responsibilities which must be fulfilled indirectly by Contractor, or when so noted, by others.

I. Page Numbering: Pages are numbered independently for each section and are recorded in the listing of sections (Index or Table of Contents) in Project Manual. The section number is shown together with the page number at the bottom of each page to facilitate the location of text in the Project Manual.

J. Project Identification: Project name (either complete or abbreviated) is recorded at top of each page of specifications to minimize possible misuse of specifications, or confusion with other project specifications.

K. Specification Content: Because of methods by which the project specification has been produced, certain general characteristics of content, and conventions in use of language are explained as follows:
   1. Specifying Methods: The techniques or methods of specifying to record requirements varies throughout text, and may include "prescriptive," "open generic-descriptive," "compliance with standards," "performance," "proprietary," or a combination of these. The method used for specifying one unit of work has no bearing on requirements for another unit of work.
   2. Overlapping and Conflicting Requirements: Where compliance with two or more industry standards or sets of requirements is specified, and overlapping of those different standards or requirements establishes different or conflicting minimums or levels of
      quality, the most stringent requirement is intended and will be enforced, unless specifically detailed language written into the contract documents clearly indicates that a less
      stringent requirement is to be fulfilled. Refer apparently-equal-but-different requirements, and uncertainties as to which level of quality is more stringent, to Architect for a decision
      before proceeding.
   3. Contractor's Options: Except for overlapping or conflicting requirements, where more than one set of requirements are specified, for a particular unit of work, option is intended

to be Contractor's regardless of whether or not it is specifically indicated as such.

L. Minimum Quality/Quantity: In every instance, quality level or quantity shown or specified is intended to be the minimum for the work to be performed or provided. Except as otherwise specifically indicated, actual work may either comply exactly with that minimum (within specified tolerances), or may exceed that minimum within reasonable limits. In complying with these requirements, indicated numeric values are either minimums or maximums as noted or as appropriate for context of the requirements. Refer instances of uncertainty to Architect/ Engineer for decision before proceeding.

M. Specialists, Assignments: In certain instances, specification text requires (or implies) that specific work is to be assigned to specialists or expert entities, who must be engaged for the performance of that work. Such assignments shall be recognized as special requirements over which the Contractor has no choice or option. These requirements should not be interpreted so as to conflict with the enforcement of building codes and similar regulations governing the work; they are also not intended to interfere with local union jurisdiction settlements and similar conventions. Such assignments are intended to establish which party or entity involved in a specific unit of work is recognized as "expert" for indicated construction processes or
operations. Nevertheless, the final responsibility for fulfillment of entire set of contract requirements remains with the Contractor.

N. Trades: Except as otherwise indicated, the use of titles such as "carpentry" in specification text, implies neither that the work must be performed by an accredited or unionized tradesperson of corresponding generic name (such as "carpenter"), nor that specified requirements apply exclusively to work by tradespersons of that corresponding generic name.

O. Abbreviations: The language of specifications and other contract documents is of the abbreviated type in certain instances, and implies words and meanings which will be appropriately interpreted. Actual word abbreviations of a self-explanatory nature have been included in the texts. Specific abbreviations have been established, principally for lengthy technical terminology and primarily in conjunction with coordination of specification requirements with notations on drawings and in schedules. These are frequently defined in
section at first instance of use. Trade association names and titles of general standards are frequently abbreviated.

1. Singular words will be interpreted as plural and plural words will be interpreted as singular where applicable and where full context of the contract documents so indicates.

1.07 DRAWING SYMBOLS

A. General: Except as otherwise indicated, graphic symbols used on drawings are those symbols recognized in the construction industry for purposes indicated. Where not otherwise noted, symbols are defined by "Architectural Graphic Standards," published by John Wiley & Sons, Inc., seventh edition.

B. Mechanical/Electrical Drawings: Graphic symbols used on mechanical and electrical drawings are generally aligned with symbols recommended by ASHRAE. Where appropriate, these symbols are supplemented by more specific symbols as recommended by other recognized technical associations including ASME, ASPE, IEEE and similar organizations. Refer instances of uncertainty to the Architect/Engineer for clarification before proceeding.

1.08 INDUSTRY STANDARDS

A. General Applicability of Standards: Except to the extent that more explicit or more stringent requirements are written directly into the contract documents, applicable standards of the construction industry have the same force and effect (and are made a part of contract documents by reference) as if copied directly into the contract documents, or as if published copies were bound herewith. Refer to other contract documents for resolution of overlapping and conflicting requirements which result from the application of several different industry

standards to the same unit of work. Refer to individual unit of work sections for indications of which specialized codes and standard the Contractor must keep at the project site, available for reference.

1. Referenced standards (referenced directly in contract documents or by governing regulations) have precedence over non-referenced standards which are recognized in industry for applicability to work.
2. Non-referenced standards are hereby defined to have no particular applicability to the work, except as general requirements of whether the work complies with standards recognized in the construction industry.

B. Publication Dates: Except as otherwise indicated, where compliance with an industry standard is required, comply with standard in effect as of date of AHJ approval of contract documents.

1. Updated Standards: At the request of the Architect/Engineer, Contractor or governing authority, submit a change order proposal where an applicable industry code or standard has been revised and reissued after the date of the contract documents and before the performance of the work affected. The Architect/Engineer will decide whether to issue the change order to proceed with the updated standard.

C. Copies of Standards: The contract documents require that each entity performing work be experienced in that part of the work being performed. Each entity is also required to be familiar with recognized industry standards applicable to that part of the work. Copies of applicable standards are not bound with the contract documents.

1. Where copies of standards are needed for proper performance of the work, the Contractor is required to obtain such copies directly from the publication source.
2. Although certain copies of standards needed for enforcement of the requirements may be required submittals, the Architect/Engineer reserves the right to require the Contractor to submit additional copies of these standards as necessary for enforcement of the requirements.

D. Abbreviations and Names: The following acronyms or abbreviations as referenced in contract documents are defined to mean the associated names. Other names and acronyms not listed here may be referenced at various locations throughout the Contract Documents. Both names and addresses are subject to change, and are believed to be, but are not assured to be, accurate and up-to-date as of date of contract documents:

1. Aluminum Association, 900 19th Street. NW; Washington DC 20006; 202/862-5100 Fax: 202/862-5164, http://www.aluminum.org/
2. American Architectural Manufacturers Association, 1827 Walden Office Square, Suite 550, Schaumburg, Illinois 60173-4268, Phone: (847) 303-5664 Fax: (847) 303-5774, http://www.aamanet.org/index.asp
3. American Association of Nurserymen, 1000 Vermont Ave, NW Suite 300 Washington, DC 20005 Phone: 202/789-2900 Fax: 202-789-1893, http://www.anla.org/
4. AASHTO American Association of State Highway & Transportation Officials, 444 North Capitol St. Suite 249 Washington, DC 20001; 202/624-5800 Fax: (202) 624-5806, http://www.transportation.org/aashto/home.nsf/FrontPage
5. AATCC American Association of Textile Chemists and Colorists P.O. Box 12215; Research Triangle Park, NC 27709; 919/549-8141 Fax: 919-549-8933 http://www.aatcc.org/
6. American Concrete Institute, PO Box 9094, Farmington Hills, MI 48333, 38800 Country Club Drive, Farmington Hills, MI 48331, Phone: (248) 848-3700 Fax: (248) 848-3701
7. American Council of Independent Laboratories, 1629 K Street, NW, Suite 400, Washington, DC 20006 Tel: (202) 887-5872, Fax: (202) 887-0021, http://www.acil.org/
8. American Concrete Pipe Association, 222 W. Las Colinas Blvd., Suite 641, Irving, TX 75039 Phone (972) 506-7216 Fax (972) 506-7682, http://www.concrete-pipe.org
9. American Gas Association, 400 North Capitol Street NW Fourth Floor Washington, DC 20001 Phone:(202) 824-7000 Fax: 202-824-7115, http://www.aga.org/

10. Association of Home Appliance Manufacturers, Suite 402, 1111 19th St., NW Washington, DC 20036 Phone: (202) 872-5955 Fax: (202) 872-9354 http://www.aham.org/
11. Asphalt Institute, PO Box 14052 Lexington, KY 40512 Phone: 859-288-4960 Fax: 859-288-4999, http://www.asphaltinstitute.org/
12. American Institute of Architects, 1735 New York Ave. NW; Washington, DC 20006; Phone: 202-626-7300 Fax: 202-626-7547, http://www.aia.org
13. A.I.A. American Insurance Association, 1130 Connecticut Ave, NW, Ste. 1000, Washington, DC 20036 Phone: 202-828-7100 Fax: 202-293-1219,
14. American Iron and Steel Institute, 1140 Connecticut Avenue Suite 705 Washington, DC 20036 Phone: 202/452-7100, http://www.steel.org/
15. American Institute of Timber Construction, 7012 S. Revere Parkway Suite 140 Englewood, CO 80112 Phone: (303) 792-9559 Fax: (303) 792-0669, http://www.aitc- glulam.org/
16. American Lumber Standards Institute, P.O. Box 210; Germantown, MD 20874; Phone: 301/972-1700 Fax: 301/540-8004
17. American National Standards Institute 1819 L Street, NW, 6th floor, Washington, DC 20036 Phone: 202-293-8020 Fax: 202-293-9287,
18. American Plywood Association, 7011 So. 19th, Tacoma, WA 98466, (253) 565-6600 / fax: (253) 565-7265,
19. Air Conditioning and Refrigeration Institute, 4100 N. Fairfax Drive, Suite 200 Arlington, VA
    22203 703/524-8800 Fax: 703-528-3816, http://www.ari.org/
20. Adhesive and Sealant Council, 7979 Old Georgetown Road, Suite 500 Bethesda, Maryland 20814 Phone: (301) 986-9700 Fax: (301) 986-9795, http://www.ascouncil.org/
21. ASHRAE American Society of Heating, Refrigerating & Air Conditioning Engineers, 1719 Tullie Circle, NE; Atlanta, GA 30329; 404/636-8400 Fax: (404) 321-5478, http://www.ashrae.org/
22. American Society of Mechanical Engineers, Three Park Avenue New York, NY 10016 Phone: 212-591-7722 Fax: 212-591-7674, http://www.asme.org/
23. American Society of Plumbing Engineers, 8614 Catalpa Avenue, Suite 1007Chicago, IL 60656-1116 Phone: (773) 693-2773 Fax: (773) 695-9007, http://www.aspe.org/
24. American Society of Sanitary Engineers, 901 Canterbury Suite A, Westlake, OH 44145 Phone: 440-835-3040 Fax: 440-835-3488, http://www.asse-plumbing.org/
25. American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428 Phone: (610) 832-9585 Fax: (610) 832-9555, http://www.astm.org/
26. Architectural Woodwork Institute, 1952 Isaac Newton Square West Reston, VA 20190 Phone: 703-733-0600 Fax: 703-733-0584, http://www.awinet.org/
27. American Wood-Preservers' Association, P.O. Box 388 Selma, AL 36702 Phone: 334-874-9800 Fax: 334-874-9008, http://www.awpa.com/
28. American Wood Preservers Bureau, P.O. Box 5283 Springfield, VA 22150; 703/931-8180
29. American Water Works Association, 6666 W. Quincy Ave., Denver, CO 80235; 303/794-7711 Fax: 303.347.0804, http://www.awwa.org/
30. Builders' Hardware Manufacturers Association 355 Lexington Avenue, 17th Floor, New York, NY 10017 Tel: (212) 297-2122 Fax: 212-370-9047
31. BIFMA Business and Institutional Furniture Manufacturer's Association, 2680 Horizon Drive, SE / Suite A-1 Grand Rapids, MI 49546 Phone: 616/285.3963, Fax: 616-285-3765, http://www.bifma.com/
32. Certified Ballast Manufacturers, 2122 Keith Bldg.; Cleveland, OH 44115; 216/241-0711
33. Copper Development Association, 260 Madison Avenue, New York, NY 10016 Phone: 212/251-7200 Fax: 212/251-7234, http://www.copper.org/
34. CISPI Cast Iron Soil Pipe Institute, 5959 Shallowford Road, Suite 419, Chattanooga, TN 37421 Phone: 423-892-0137 Fax: 423-892-0817, http://www.cispi.org/

35. Consumer Product Safety Commission, 4330 East-West Highway, Bethesda, Maryland 20814 Telephone: (800) 638-2772 Fax: (301) 504-0124, http://www.cpsc.gov/
36. Carpet and Rug Institute, Box 2048; Dalton, GA 30720; 404/278-3176 Fax: 706-278-8835, http://www.carpet-rug.com/
37. Concrete Reinforcing Steel Institute, 933 Plum Grove Rd.; Schaumburg, IL 60195; Phone: 847.517.1200 Fax: 847.517.1206, http://www.crsi.org/
38. Construction Specifications Institute, 99 Canal Center Plaza, Suite 300, Alexandria VA 22314; Phone: 1-800-689-2900 Fax: 703-684-8436, http://www.csinet.org/
39. Ceramic Tile Institute, 12061 Jefferson Blvd. Culver City, CA 90230; Phone: 310-574-7800 Fax: 310-821-4655, http://www.ctioa.org/
40. Door and Hardware Institute, 14150 Newbrook Drive, Suite 200, Chantilly, VA 20151; Phone: 703.222.2010 Fax: 703.222.2410 http://www.dhi.org/
41. Decorative Laminate Products Association (Formerly National Association of Plastic Fabricators) Hulman Building; 20th Floor; 120 West Second Street; Dayton, OH 45402; 513/228-1041
42. Department of Transportation, 400 7th St., SW; Washington, DC 20006; Phone: 202-366-4000,
43. Electronic Industries Alliance, 2500 Wilson Blvd. Arlington, VA 22201, Phone: (703) 907-7500, http://www.eia.org/
44. Environmental Protection Agency, Ariel Rios Building 1200 Pennsylvania Avenue, N.W. Washington, DC 20460; (202) 272-0167, http://www.epa.gov/
45. Federal Communications Commission, 445 12th Street SW, Washington, DC 20554; Phone: 1-888-225-5322 Fax: 1-866-418-0232, http://www.fcc.gov/
46. Glass Association of North America, 2945 SW Wanamaker Drive, Suite A Topeka, KS 66614; Phone: 785-271-0208 Fax: 785-271-0166, http://www.glasswebsite.com
47. Factory Mutual Engineering Corp., 1151 Boston-Providence Turnpike; Norwood, MA 02062; 617/762-4300
48. Gypsum Association, 810 First St., NE, #510, Washington DC, 20002, Phone: 202-289-5440; Fax: 202-289-3707, http://www.gypsum.org/
49. Institute of Electrical and Electronic Engineers, Inc., 3 Park Avenue, 17th Floor New York, New York 10016 Phone: 212-419-7900 Fax: 212-752-4929, http://www.ieee.org/
50. IESNA Illuminating Engineering Society of North America, 120 Wall Street, Floor 17, New York, NY 10005 Phone: 212-248-5000 fax: 212-248-5017, http://www.iesna.org/
51. Industrial Risk Insurers, 85 Woodland St.; Hartford, CT 06102; 203/525-2601
52. Mechanical Contractors Association of America, 1385 Piccard Drive Rockville, MD 20850 Phone: 301-869-5800 Fax: 301-990-9690, http://www.mcaa.org/
53. Manufacturers Standardization Society of the Valve and Fittings Industry, 127 Park St. NE, Vienna, VA 22180 Phone: 703-281-6613 Fax: 703-281-6671, http://www.mss-hq.com/
54. NAAMM National Association of Architectural Metal Mfrs., 8 South Michigan Avenue, Suite 1000, Chicago, Illinois 60603 Phone: 312-332-0405 Fax: 312-332-0706, http://www.naamm.org/ (See DLPA)
55. National Builders Hardware Association (No Part of HDI) 711 Old Springhouse Rd.; McLean, VA 22101; 703/556-3990
56. National Bureau of Standards (U.S. Dept. of Commerce), US Department of Commerce, 1401 Constitution Avenue, NW, Washington, DC 20230, http://www.commerce.gov/
57. National Electrical Code (by NFPA)
58. National Electrical Contractors Association, 3 Bethesda Metro Center, Suite 1100 Bethesda, MD 20814 Phone: (301) 657-3110 Fax: (301) 215-4500 http://www.necanet.org/
59. National Elevator Industry, Inc. 1677 County Route 64 PO BOX 838, Salem, New York 12865-0838 Phone: 518-854-3100 Fax: 518-854-3257, http://www.neii.org/
60. National Electrical Manufacturers Association, 1300 N. 17th Street, Suite 1847,

Rosslyn, VA, 22209. Phone: (703) 841-3200 Fax: (703) 841-5900, http://www.nema.org/

61. National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02269; 617/770-3000 Fax: 1-617-770-0700, http://www.nfpa.org/
62. N.F.P.A.National Forest Products Association, 619 Massachusetts Ave., NW: Washington, DC 20036; 202/797-5800
63. National Hardwood Lumber Association, 6830 Raleigh-LaGrange Road, Memphis, TN 38184; Phone: (901) 377-1818, http://www.natlhardwood.org/
64. National Kitchen Cabinet Association, 1899 Preston White Drive, Reston, VA 20191-5435; Phone: 703-264-1690 Fax: 703-620-6530, http://www.kcma.org/
65. National Particleboard Association, 18928 Premier Court, Gaithersburg, MD 20879; Phone: (301) 670-0604 Fax: (301) 840-1252
66. National Paint and Coatings Association, 1500 Rhode Island Ave., NW; Washington, DC 20005; 202/462-6272 Fax: (202) 462-8549 http://www.paint.org/
67. National Roofing Contractors Association, 10255 W. Higgins Road, Suite 600, Rosemont, IL 60018; Phone: (847) 299-9070 Fax: (847) 299-1183, http://www.nrca.net/
68. National Sanitation Foundation, P.O. Box 130140, 789 N. Dixboro Road Ann Arbor, MN 48113; Phone: 734-769-8010 Fax: 734-769-0109, http://www.nsf.org/
69. Occupational Safety & Health Administration (U.S. Dept. of Labor) 200 Constitution Avenue, NW Washington, DC 20210, http://www.osha.gov/
70. Plumbing and Drainage Institute, 800 Turnpike Street, Suite 300, North Andover, MA 01845; Phone: 978-557-0720 Fax: 978-557-0721, http://www.pdionline.org/
71. Product Standard of NBS (U.S. Dept of Commerce), Government Printing Office; Washington, DC 20402
72. Resilient Floor Covering Institute, 401 E. Jefferson Street, Suite 102, Rockville, MD. 20850; Phone: 301-340-8580 Fax: 301-340-7283, http://www.rfci.com/
73. Redwood Inspection Service (Grading Rules), 591 Redwood Hwy; Suite 3100; Mill Valley, CA 94941; 415/381-1304
74. S.D.I.Steel Door Institute, 30200 Detroit Road, Cleveland, OH 44145; Phone: 440.899.0010 Fax: 440.892.1404, http://www.steeldoor.org/
75. Safety Glazing Certification Council, PO Box 9 Henderson Harbor, NY 13651; Phone: (315) 646-2234 Fax: (315) 646-2297, http://www.sgcc.org/
76. SMACNA Sheet Metal & Air Conditioning Contractors' National Association, 4201 Lafayette Center Drive Chantilly, Virginia 20151; Phone: (703) 803-2980 Fax: (703) 803-3732, http://www.smacna.org/
77. Tile Council of America, 100 Clemson Research Center, Anderson, SC 29625; Phone: 864-646-8453 Fax: 864-646-2821, http://www.tileusa.com/
78. Thermal Insulation Manufacturers Association, 7 Kirby Plaza; Mt. Kisco, NY 10549; 914/241-2284
79. Underwriters Laboratories Inc, 333 Pfingsten Rd.; Northbrook, IL 60062; 312/272-8800 Fax: 847-272-8129, http://www.ul.com/
80. WCLIBWest Coast Lumber Inspection Bureau (Grading Rules), P.O. Box 23145; Portland, OR 97223; 503/639-0651 Fax: 503-684-8928, http://www.wclib.org/
81. Window & Door Manufacturers Association, 1400 E. Touhy Ave. Suite 470 Des Plaines, IL

    60018; Phone: 847-299-5200 Fax: 847-299-1286 http://www.nwwda.org/
82. Woodwork Institute of California, 3188 Industrial Boulevard PO Box 980247 West Sacramento, CA 95798; Phone:(916) 372-9943 Fax (916) 372-9950, http://www.wicnet.org/
83. Wire Reinforcement Institute, 942 Main Street Suite 300 Hartford, CT 06103; Phone: (800)

    552-4974 FAX: (860) 808-3009, http://www.wirereinforcementinstitute.org/
84. Water Systems Council, 1101 30th Street, N.W., Suite 500 Washington, DC 20007; Phone: (202) 625-4387 Fax: (202) 625-4363, http://www.watersystemscouncil.org/

85. WSFI Wood and Synthetic Flooring Institute, 4415 West Harrison Street, Suite 242C Hillside, IL 60162; Phone: (708) 449-2933 Fax: (708) 449-0837
86. Western Wood Products Association (Grading Rules), 522 SW Fifth Ave. Suite 500, Portland, Oregon 97204; Phone: 503-224-3930 Fax: 503-224-3934 http://www.wwpa.org/
87. W.W.P.AWoven Wire Products Association, 1641 E. Higgins Lake Dr. Roscommon, MI 48653; Phone: 517-821-6621 Fax: 517-821-9490, http://www.wovenwire.org/

1.09 GOVERNING REGULATIONS/AUTHORITIES

A. General: The procedure followed by Architect/Engineer has been to contact governing authorities where necessary to obtain information needed for the purpose of preparing contract documents; recognizing that such information may or may not be of significance in relation to Contractor's responsibilities for performing the work. Contact governing authorities directly for necessary information and decisions having a bearing on performance of the work.

B. Trade Union Jurisdiction: It is a procedural requirement that the Contractor maintain, and require prime subcontractors to maintain, complete current information on jurisdictional matters, regulations actions, and pending actions, as applicable to the work.
   1. Discuss new developments at appropriate project meetings at the earliest feasible dates.
   2. Record information of relevance along with the action agreed upon.
   3. The manner in which contract documents have been organized and subdivided is not intended to be an indication of jurisdictional or trade union agreements.
   4. Assign and subcontract the work, and employ tradesmen and laborers, in a manner which will not unduly risk jurisdictional disputes of a kind which could result in conflicts, delays, claims and losses in the performance of the work.

1.10 SUBMITTALS

A. Permits, Licenses and Certificates: For the Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgements, and similar documents, correspondence and records established in conjunction with compliance with standards and regulations bearing upon performance of the work.

PART 2 PRODUCTS - NOT USED.

PART 3 EXECUTION – NOT USED.

END OF SECTION

SECTION 01 4523
TESTING AND INSPECTION SERVICES

PART 1GENERAL

1.01 DESCRIPTION

A. Work Included:
   1. Selection and payment of Testing and Inspection Agency
   2. Testing and Inspection Agency submittals.
   3. Testing and Inspection Agency responsibilities.
   4. Testing and Inspection Agency reports.
   5. Limits on Testing and Inspection authority.
   6. Contractor's Responsibilities.
   7. Architect's Responsibilities.

B. Related Sections:
   1. Drawings and Contract Documents, including General and Supplemental Conditions.
   2. Section 01 3300 (01330) - Submittal Procedures: Manufacturer's certificates.
   3. Section 01 4000 (01400) - Quality Requirements.
   4. Pertinent Sections of other Divisions requiring tests and inspections.

1.02 REFERENCES

A. ASTM C802 - Practice for Conducting an Interlaboratory Test Program to Determine the Precision of Test Methods for Construction.

B. ASTM C1021 - Practice for Laboratories Engaged in the Testing of Building Sealants.

C. ASTM C1077 - Practice for Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation.

D. ASTM C1093 - Practice for Accreditation of Testing Agencies for Unit Masonry.

E. ASTM D290 - Recommended Practice for Bituminous Mixing Plant Inspection.

F. ASTM D3740 - Practice for Evaluation of Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.

G. ASTM D4561 - Practice for Quality Control Systems for an Inspection and Testing Agency for Bituminous Paving Materials.

H. ASTM E329 - Practice for Use in the Evaluation of Inspection and Testing Agencies as Used in Construction.

I. ASTM E543 - Practice for Determining the Qualification of Nondestructive Testing Agencies.

J. ASTM E548 - Practice for Preparation of Criteria for Use in the Evaluation of Testing Laboratories and Inspection Bodies.

K. ASTM E699 - Practice for Criteria for Evaluation of Agencies Involved in Testing, Quality Assurance, and Evaluating Building Components in Accordance with Test Methods Promulgated by ASTM Committee E6.

1.03 SUBMITTALS

A. Testing Agency Qualifications:
   1. Prior to start of Work, submit agency name, address, and telephone number, and names of full time registered Engineer and responsible officer.
   2. Submit copy of report of laboratory facilities inspection made by NIST Construction Materials Reference Laboratory during most recent inspection, with memorandum of remedies of any deficiencies reported by the inspection.

B. Test Reports: After each test/inspection, promptly submit two copies of report to Architect and to Contractor, and additional as noted.
   1. Include:
      a. Date issued.
      b. Project title and number.
      c. Name of inspector.
      d. Date and time of sampling or inspection.
      e. Identification of product and specifications section.
      f. Location in the Project.
      g. Type of test/inspection.
      h. Date of test/inspection.
      i. Results of test/inspection.
      j. Conformance with Contract Documents.
      k. When requested by Architect, provide interpretation of results.
   2. Test reports are submitted for Architect's knowledge as contract administrator or for the Owner, for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.

C. Manufacturer's Field Reports: Submit reports for Architect's benefit as contract administrator or for Owner.
   1. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.

1.04 SELECTION AND PAYMENT

A. Owner shall select Testing Agency.

B. Owner will employ and pay for initial testing indicated under specific specification sections and specifically noted to be paid by the Owner.
   1. Contractor shall pay for testing when:
      a. Additional tests and inspections by Owner's testing agency where initial tests and inspections reveal failure to meet Contract requirements.
      b. Excessive inspection time by Owner's testing agency is required by Contractor's failure to provide sufficient workman or to properly pursue the progress of work.
      c. Test(s) deemed necessary by the Owner/Architect to evaluate any substitution proposed by the Contractor.
      d. Testing and inspection for the Contractor's convenience.
      e. Testing and inspection overtime necessitated by the Contractor's schedule.

C. Employment of inspection firm in no way relieves Contractor of obligation to perform Work in accordance with requirements of Contract Documents.

D. Employment of any testing laboratory by Contractor shall be subject to Owner approval; laboratory shall be under direct supervision of a registered Engineer and shall conform to ASTM 329. Laboratory of concrete producer shall not be acceptable for concrete mix designs.

E. Owner reserves the right to test any material or work of Project at any time, whether or not tests are indicated in Contract Documents.

1.05 QUALITY ASSURANCE

A. Conform to requirements of the referenced standards.

B. Laboratory: Authorized to operate in State in which Project is located.

C. Laboratory Staff: Maintain a full time registered Engineer on staff to review services.

D. Testing Equipment: Calibrated at reasonable intervals with devices of an accuracy traceable to either National Bureau of Standards or accepted values of natural physical constants.

1.06 TESTING AGENCY RESPONSIBILITIES

A. Perform inspections, tests, and other services as specified by various specification sections.

B. Test samples of mixes submitted by Contractor.

C. Provide qualified personnel at site. Cooperate with Architect/Engineer and Contractor in performance of services.

D. Perform specified sampling and testing of Products in accordance with specified standards.

E. Ascertain compliance of materials and mixes with requirements of Contract Documents.

F. Promptly notify Architect/Engineer and Contractor of observed irregularities or non-conformance of Work or Products.

G. Perform additional tests required by Architect/Engineer.

H. Attend preconstruction meetings and progress meetings.

1.07 AGENCY AND INSPECTION REPORTS

A. After each test, observation or inspection, promptly submit copies of report to Architect, Engineer, Inspector of Record, Owner, Contractor and as otherwise directed.

B. Include:
1. Date issued.
2. Project title and number.
3. Name of inspector.
4. Date and time of sampling or inspection.
5. Identification of product and specifications section.
6. Location in the Project.
7. Type of inspection or test.
8. Date of test.
9. Results of tests.
10. Conformance with Contract Documents.

C. When requested by Architect/Engineer, provide interpretation of test or inspection results.

1.08 LIMITS ON TESTING AND INSPECTION AUTHORITY

A. Agency or laboratory may not release, revoke, alter, or enlarge on requirements of Contract Documents.

B. Agency or laboratory may not approve or accept any portion of the Work.

C. Agency or laboratory may not assume any duties of Contractor.

D. Agency or laboratory has no authority to stop the Work.

1.09 CONTRACTOR RESPONSIBILITIES

A. Provide information regarding activities requiring special inspection and tests to District's inspection and testing laboratory upon request.

B. Deliver to agency or laboratory at designated location, adequate samples of materials proposed to be used which require testing, along with proposed mix designs.

C. Cooperate with laboratory personnel, and provide access to the Work.

D. Provide incidental labor and facilities:
1. To provide access to Work to be tested.
2. To obtain and handle samples at the site or at source of Products to be tested.
3. To facilitate tests.
4. To provide storage and curing of test samples.

E. Notify agency or laboratory and Architect/Engineer forty-eight (48) hours prior to expected time for operations requiring testing services. Become familiar with time constraints of tests required. Schedule work to allow time for performance of required tests.

F. Employ services of an independent qualified testing laboratory and pay for additional samples and tests required by Contractor beyond specified requirements.

1.10 ARCHITECT RESPONSIBILITIES

A. Architect is not responsible for notification of the Testing Agency or scheduling it's work. B. Architect will not be responsible for the actions of the Testing Agency.

1.11 RE-TESTING

A. When initial tests indicate non-compliance with the Contract Documents, subsequent re-testing shall be performed by the same testing laboratory and the costs thereof shall be paid by the Owner and deducted from the Contract Sums owed to the Contractor.

PART 2 PRODUCTS

2.01 NOT USED.

PART 3 EXECUTION

3.01 SCHEDULE OF INSPECTIONS

A. Schedule of Tests and Inspections is attached following this section.

B. Pertinent Sections of other Divisions: Other tests or inspections required; standards for testing.

PART 4 REQUIREMENTS

4.01 TESTS AND INSPECTIONS - CHAPTER 17

A. All tests shall be performed by a testing facility acceptable to the Architect/Engineer

B. Test reports shall be addressed to, and sent to, the Owner by testing facility. Copies of all test reports shall be sent to the architect, the structural engineer, and the project inspector by the testing facility. All reports shall be sent within 14 days of the date of the test. See Title 24, Part 1, 4-335 (d).

4.02 SCHEDULE OF TESTS

A. Special inspections and testing shall be performed by an approved agency in accordance with CBC Chapter 17 and the statement of special inspections as required by CBC Sections 1704.2.3 and 1704.3 for building structural elements summarized as follows:

LIGHT GAUGE STEEL CONSTRUCTION per CBC Sections 1705.2 and table 1705.2.2 including material identification, shop and field welding.

SOILS per CBC Section 1705.6, Table 1705.6, and the approved soils report including subgrade preparation, foundation bearing materials and depth of excavation, and verification, placement and testing of controlled fill.

Special cases per CBC Section 1705.1.1 and product ICC Reports for all structural materials and systems required to be installed in accordance with additional manufacturer's instructions that prescribe requirements not contained in the CBC or referenced standards including post installed anchor bolts in concrete.

END OF SECTION

SECTION 01 5000

TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Provide and maintain all temporary facilities and controls required for proper performance of the work. Remove at completion of the work. Facilities required may include but are not limited to the following:

B. Temporary utilities.

C. Temporary telephone service.

D. Temporary sanitary facilities.

E. Temporary Controls: Barriers, enclosures, and fencing.

F. Security requirements.

G. Vehicular access and parking.

H. Waste removal facilities and services.

I. Field offices.

1.02 TEMPORARY UTILITIES

A. Provide and pay for all electrical power, lighting, and water required for construction purposes.

1. Determine nearest location of water.
2. Provide piping or hose to carry water to all locations where required. All water used on the project shall be potable water.

B. Pay all costs for provision of temporary service.

C. Existing facilities may not be used.

D. Use trigger-operated nozzles for water hoses, to avoid waste of water.

1.03 TEMPORARY HEATING, COOLING, VENTILATING

A. Provide temporary heating, cooling, dehumidification and ventilation from an approved source whenever necessary for curing, drying, cooling or warming spaces as may be required for the installation of materials or finishes in specified conditions.

B. Maintain facilities or equipment as required for continuous operation of utilities in service. Do not allow interruption of utilities or services. Supply all fuel of types required.

C. Continue temporary services uninterrupted until permanent building systems are completed, capable of maintaining specified conditions without supplemental equipment, and accepted by the Owner.

1.04 TEMPORARY SANITARY FACILITIES

A. Provide and maintain required facilities and enclosures. Provide at time of project mobilization.

B. Comply with laws, ordinances or regulations of public authorities having jurisdiction.

C. Maintain daily in clean and sanitary condition, adequately supplied.

1.05 BARRIERS

A. Provide barriers and fences to prevent unauthorized entry to construction areas, to allow for owner's use of site and to protect existing facilities and adjacent properties from damage from construction operations and demolition.

B. Provide barricades and covered walkways required by governing authorities for public rights-of- way and for public access to existing building.

C. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

D. Relocate as allowed by the progress of the work to minimize the area enclosed. Avoid

unnecessary encroachment on existing facilities.

E. Do not remove without Owner's authorization.

1.06 TREE AND PLANT PROTECTION

A. Preserve and protect existing trees and plants at site which are designated to remain, and those adjacent to site.

B. Following consultation with Architect, remove roots and branches which interfere with indicated construction.

1. Employ a qualified tree surgeon to prune and treat cuts.

C. Provide temporary barriers to a height of six feet, around each, or around each group, of trees and plants.

D. Protect root zones of trees and plants:

1. Do not allow vehicular traffic and parking.
2. Do not store materials or products.
3. Prevent dumping of refuse or chemically injurious materials or liquids.
4. Prevent puddling or continuous running water.

E. Carefully supervise excavating, grading and filling, and subsequent construction operations, to prevent damage.

F. Replace, or suitably repair, trees and plants designated to remain which are damaged or destroyed due to construction operations.

1.07 CONSTRUCTION EQUIPMENT

A. Provide, equip and maintain all construction equipment in strict accordance with all applicable statutes, laws, ordinances, rules and regulations of the authority having jurisdiction. Provide as required for use of all trades. Hoists and scaffolding shall comply with the latest Construction Safety Orders issued by the Division of Industrial Safety, State of California and the Associated General Contractor's "Manual of Accident Prevention in Construction," latest edition.

B. Provide hoists and construction elevators complete with required operators, power and signals.

C. Provide, maintain and remove upon completion of the work all temporary rigging, scaffolding, hoisting equipment, rubbish chutes, barricades around openings and excavations, ladders between floors, fences and all other temporary work as required to complete work.

1.08 PROTECTION OF INSTALLED WORK

A. Protect installed Work throughout to maintain undamaged. Provide special protection where specified in individual specification sections.

B. Provide temporary and removable protection for installed Products. Control activity in immediate work area to prevent damage.

C. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.

D. Prohibit traffic from landscaped areas.

1.09 EXTERIOR PROTECTION

A. Provide temporary weather-tight enclosure of exterior walls for successive areas of building as necessary to:

1. Allow for progress of work;
2. Provide acceptable working conditions;
3. Provide weather protection for materials;

4. Permit effective heating, cooling, dehumidification or ventilation as circumstances may require;

5. Prevent entry of unauthorized persons.

B. Bear all costs for replacement of damage to existing or new construction, construction materials and equipment from effects of weather, theft and unauthorized entry.

1.10 SECURITY

A. Provide security and facilities to protect Work, existing facilities, and Owner's operations from unauthorized entry, vandalism, or theft.

B. Coordinate with Owner's security program.

1.11 VEHICULAR ACCESS AND PARKING

A. Coordinate access and haul routes with governing authorities and Owner. B. Provide and maintain access to fire hydrants, free of obstructions.

C. Provide means of removing mud from vehicle wheels before entering streets.

D. Provide temporary parking areas to accommodate construction personnel. When site space is not adequate, provide additional off-site parking.

E. Accommodate delivery vehicles.

F. Provide secure, enclosed storage areas for materials, equipment and debris. Locate as directed by Owner and as accepted by authorities having jurisdiction.

1.12 WASTE REMOVAL

A. Provide waste removal facilities and services as required to maintain the site in clean and orderly condition.

B. Provide containers with lids. Remove trash from site periodically.

C. If materials to be recycled or re-used on the project must be stored on-site, provide suitable non-combustible containers; locate containers holding flammable material outside the structure unless otherwise approved by the authorities having jurisdiction.

1.13 FIELD OFFICES

A. Owner will not provide office space or furniture for the Contractor’s use.

B. Office: Weathertight, secure, with lighting, electrical outlets, heating, cooling equipment, and equipped with sturdy furniture, drawing rack and drawing display table.

C. Provide space for Project meetings, with table and chairs to accommodate 6 persons.

D. Provide a complete set of Contract Documents, including Addenda and Modifications, at all times.

E. Locate offices a minimum distance of 30 feet from existing and new structures and as acceptable to Owner and authorities having jurisdiction.

F. Relocate field offices as progress of the work may require.

G. The Architect and Owner and their representatives shall have free access to the Contractor's field office at all times.

H. Inspector Field Office: Provide office with a minimum of two individual offices of suitable size for the Inspector of Record. Provide as for Contractor's Field Office and the following facilities:

1. Sturdy desk with file drawers and chair. The Inspector may provide additional furniture as he may require.

2. Copy Machine as specified.

3. Provide temporary telephone lines, and separate line(s) for fax and all handsets and fax terminal equipment as specified.

4. The Architect and Owner and their representatives shall have free access to the Inspector’s field office at all times. Contractor shall not have access to the Inspector’s office.

5. The Inspector will be responsible for removing his files and equipment upon completion of the work.

1.14 CONTINUITY OF SERVICES

A. Provide temporary panels, raceway, conductors, piping, ductwork and other facilities or equipment as required for continuous operation of utilities in service. Do not allow interruption of utilities.

1. Maintain all utility services, such as water, gas, sewers, electricity, data, cable television, communication, clock, bell, or fire protection system serving the project, or any part of it, in continuous operation at all times for the duration of the contract.
2. Coordinate in writing with the Owner, the transfer of utilities function to new systems at least two weeks in advance of the proposed date.
3. Notify and obtain approval from agencies having jurisdiction over utilities prior to transfer of function.
4. Coordinate provision and removal of temporary facilities with phasing of construction operations as indicated, or as necessary for continuity of service.

1.15 DUST CONTROL

A. Control dust on the site. Maintain measures to prevent dust and debris from being transported outside the area of Work. Assume responsibility for damage caused by dust to the Work and for damage caused by dust outside the area of Work. Correct damages at Contractor's expense.

B. Refer to pertinent sections of other divisions specifying earthwork, grading and other dust-generating activities for additional requirements.

1.16 WATER CONTROL

A. Grade site to drain. Provide, operate, and maintain pumping equipment as required to maintain excavations and site construction areas free of water.

B. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion.

C. Do not permit water to stand in locked-in areas of buildings to receive concrete slabs-on-grade, nor on such slabs following their placement. Provide pumping or dewatering facilities and monitor during storm events to prevent these conditions.

1.17 WEED CONTROL

A. Remove weeds from site that grow over the duration of the project.

B. Prevent incorporation of organic materials into grading or topdressing.

1.18 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

A. Remove temporary utilities, equipment, facilities, materials, prior to Final Application for Payment inspection.

B. Return all exterior areas utilized for temporary facilities to their original natural state or, when called for as part of the Work, complete areas as shown or noted.

C. Clean and repair damage caused by installation or use of temporary work.

PART 2 PRODUCTS - NOT USED.

PART 3 EXECUTION - NOT USED.

END OF SECTION

SECTION 01 6000

PRODUCT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. General product requirements.

B. Re-use of existing products.

C. Transportation, handling, storage and protection.

D. Product option requirements.

E. Substitution limitations and procedures.

F. Procedures for Owner-supplied products.

G. Maintenance materials, including extra materials, spare parts, tools, and software.

1.02 RELATED REQUIREMENTS

A. Document – Notice Inviting Bids: Products designated by Owner as “City Standards", as applicable.

B. Document 00-2100 - Instructions to Bidders: Product options and substitution procedures prior to bid date.

C. Document – General Conditions of the Contract: Product options and substitution procedures.

D. Section 01-2700 - Project Forms.

E. Section 01-4000 - Quality Requirements: Product quality monitoring.

F. Section 01-6116 - Volatile Organic Compound (VOC) Content Restrictions: Requirements for VOC-restricted product categories.

1.03 DEFINITIONS

A. Request For Substitution: Requests for changes in products, materials, or equipment required by Contract Documents proposed by the Contractor prior to and after award of the Contract are considered requests for substitutions. The following are not considered substitutions;
   1. Revisions to Contract Documents requested by the Owner Or Architect.
   2. Specified options of products, materials, and equipment included in Contract Documents.

1.04 SUBMITTALS

A. Proposed Products List: Submit list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.
   1. Submit within 15 days after date of Agreement.
   2. For products specified only by reference standards, list applicable reference standards.

B. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.

C. Shop Drawing Submittals: Prepared specifically for this Project; indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

D. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
   1. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.

PART 2 PRODUCTS

2.01 EXISTING PRODUCTS

A. Do not use materials and equipment removed from existing premises unless specifically required or permitted by the Contract Documents.

B. Unforeseen historic items encountered remain the property of the Owner; notify Owner promptly upon discovery; protect, remove, handle, and store as directed by Owner.

C. Existing materials and equipment indicated to be removed, but not to be re-used, relocated, reinstalled, delivered to the Owner, or otherwise indicated as to remain the property of the Owner, become the property of the Contractor; remove from site.

2.02 NEW PRODUCTS

A. Provide new products unless specifically required or permitted by the Contract Documents.

B. Provide interchangeable components of the same manufacturer for components being replaced.

C. Products or equipment referenced with a manufacturer’s name and/or model number shall be provided with all standard materials, components, compliance requirements and features normally furnished for that model or product. These items and requirements are inherent in the specification whether or not individually itemized.

D. Salient Physical Attributes: Physical and other characteristics of products which may not be individually noted in the specifications are essential parts of the product specification. Products shall possess all attributes set forth in the manufacturer's catalog description for the specified item, except for such modifications thereto as may be indicated in the Contract Documents. Such attributes include:

1. Size: Dimensions, Form Factor (relative proportions of height, width, depth). Ability to fit in space provided, without change to other assemblies or systems.
2. Capacity: Ability to fulfill specified requirements.
3. Weight: Ability to be supported and braced by structure as shown.
4. Physical arrangement of connections or ports: Intakes, exhausts, utility connections and other such items; their dimensions, form factors and relative proportions. Connect to other systems, ductwork, utilities, controls without changes to other systems.
5. Required Clearances: Vertical, horizontal, to other equipment or construction, other similar attributes.

E. Proprietary Names, Catalog Numbers and Identification: These attributes may be included for convenience in identifying products. Unless modified by Specifications or notation on Drawings, manufacturer's complete product catalog description for indicated product name or number shall constitute requirements for each product as if fully included in the product specification. Products shall incorporate all features set forth in the manufacturer's catalog description for the standard item, except for such modifications thereto as may be indicated in the Contract Documents.

F. Proprietary names, catalog numbers, and specific requirements as may be set forth, are given to establish standard of design and quality for materials, construction and workmanship. Use of this information to identify products is not intended to preclude use of alternate products by other manufacturers, except as specified in that given section.

G. Manufacturer’s Requirements: All deviations from design requirements shown or specified, resulting either from Contractor’s or supplier’s change of model, or manufacturer’s recommendation, or from submitted alternates or accepted substitutions, shall be clearly indicated on the Contractor's submittals. Contractor shall provide all such manufacturer or supplier supplemental requirements at no additional cost.

2.03 PRODUCT OPTIONS

A. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.

B. Products Specified by Naming a Single Manufacturer with a Provision for Substitutions: Submit a request for substitution in accordance with specified procedures for products meeting specifications from any manufacturer not named. For such specifications, the Architect is aware of only one manufacturer providing products meeting the specification, pursuant to PCC 3400.

C. Products specified as Basis of Design: Products specified by Naming a Single Manufacturer and a list of alternate manufacturers: Submit a request for substitution in accordance with specified procedures for products meeting specifications from any named manufacturer other than the listed manufacturer. For such specifications, listing of additional alternate manufacturers is not a representation that any of the alternate manufacturers will offer products that will be acceptable alternates for the specified items.

D. Products Specified by Naming Multiple Manufacturers with a Provision for Substitutions: Submit a request for substitution in accordance with specified procedures for products meeting specifications from any manufacturer not named.

E. Products Designated as "City Standards", Specified by Naming A Single Manufacturer or Multiple Manufacturers as listed in the Notice Inviting Bids: Use only a product of one of the manufacturers named and meeting specifications. No options or substitutions allowed.

2.04 MAINTENANCE MATERIALS

A. Furnish extra materials, spare parts, tools, and software of types and in quantities specified in individual specification sections.

B. Deliver to Project site; obtain receipt prior to final payment.

PART 3 EXECUTION

3.01 NOT USED.

3.02 LIMITATIONS ON SUBSTITUTIONS SUBMITTED AFTER THE AWARD OF THE CONTRACT

A. The Contract is based upon the standards of quality established by those items of equipment and/or materials which are indicated in the Contract Documents, including those products designated in the Notice Inviting Bids as “City Standards”.

B. Architect will consider substitution requests received after the established date of the receipt of bids or contract award only when one or more of the following conditions are met and documented:
   1. Specified item fails to comply with regulatory requirement.
   2. Specified item is no longer manufactured.
   3. Specified item, through no fault of the Contractor, unavailable in the time frame required to meet project schedule.
   4. Specified item, through subsequent information disclosure, will not perform properly or fit in designated space.
   5. Manufacturer declares specified product to be unsuitable for use intended or refuses to warrant installation of product,
   6. Substitution would be, in the sole judgment of the Architect, a substantial benefit to the Owner in terms of cost, time, energy conservation, or other consideration of merit.

C. Notwithstanding other provisions of this section and the above, the Architect may consider a request for substitution after the date of the receipt of bids or contract award, if in the sole discretion of the Architect, there appears to be just cause for such a request. The acceptance of such a late request does not waive any other specified requirement.

D. Architect will consider a request for substitution after the date of the receipt of bids or contract award only if request is made in strict conformance with provisions of this section. Request shall be fully responsive to all product requirements of the specified product, including those requirements noted in this section in the article titled PRODUCTS.

E. Substitutions will not be considered when they are indicated or implied on shop drawing

or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.

1. Review of shop drawings does not constitute acceptance of substitutions indicated or implied on shop drawings.
2. Substitutions will not be considered when requested or submitted directly by subcontractor or supplier.

F. Contractor's failure or inability to pursue the work promptly or coordinate activities properly shall not establish a cause for consideration of Substitutions.

G. Burden of proof of merit of requested substitution is the responsibility of the Contractor.

H. It is the sole responsibility of the Contractor to establish proper content of submittal for requests for substitutions. Incomplete submittals will be rejected.

I. When substitution is not accepted, provide specified product.

J. Substitute products shall not be provided without written acceptance by Change Order.

3.03 SUBSTITUTION PROCEDURES

A. Instructions to Bidders and General Conditions of the Contract specify time restrictions for submitting requests for substitutions during the bidding period. Comply with requirements related documents and procedures specified in this section.

B. Do not request substitutions after expiration of specified periods.

C. Substitutions may be considered when a product becomes unavailable through no fault of the Contractor.

D. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents.

E. All Performance Requirements listed in Articles titled QUALITY ASSURANCE, DESIGN CRITERIA, PERFORMANCE REQUIREMENTS and WARRANTY must be met and provided with the Request For Substitution.

F. All Salient Physical Attributes must be met and documented with the Request For Substitution.

G. Document each request on Architect's Request For Substitution (RFS) form with complete data substantiating compliance of proposed substitution with Contract Documents. All requests for substitution must be submitted on the specified form which may be obtained from the Architect. Requests received without the Request Form will be rejected.

H. A request for substitution constitutes a representation that the submitter:

1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product.
2. Will provide the same warranty for the substitution as for the specified product.
3. Will coordinate installation and make changes to other Work that may be required for the Work to be complete with no additional cost to Owner.
4. Waives all claims for additional costs or time extension which may subsequently become apparent.
5. Will reimburse Owner and Architect for review or redesign services associated with re- approval by authorities.

I. Regulatory Requirements: Proposer requesting the substitution shall be responsible for obtaining all regulatory approvals required for proposed substitutions.

1. All regulatory approval shall be obtained for proposed substitutions prior to submittal of substitution request to Architect.
2. All costs incurred by the Owner in obtaining regulatory approvals for proposed substitutions, including the costs of the Architect and any authority having jurisdiction over the project shall be reimbursed to the Owner. Costs of these services shall be reimbursed regardless of final acceptance or rejection of substitution.

J. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or when acceptance will

require revision to the Contract Documents.

K. Substitution Submittal Procedure:
   1. Submit one original signature copy of only the Request For Substitution Form included in this Project Manual for consideration. Forms provided by proposer or other agencies or organizations are not acceptable. Limit each request to one proposed substitution.
   2. Submit shop drawings, product data, and certified test results attesting to the proposed product equivalence, including:
      a. Statement of cause for substitution request.
      b. Identify product by specification section and article number. c. manufacturer's name, address, and phone number.
      d. List of fabricators, suppliers, and installers as appropriate.
      e. List of similar Projects where proposed products have been used, date of installation and names of Architect and Owner.
      f. Confirmation of regulatory approvals
      g. Product data, including drawings and product samples.
      h. Product Size, weight, configuration of connections, ports or vents. i. Fabrication and installation procedures.
      j. Comparison of the qualities of the proposed substitution with that specified. k. Cost data comparing the proposed substitution with the product specified.
      l. Any required license fees or royalties.
      m. Availability of maintenance service and source of replacement materials.
      n. Coordination information, including a list of changes or modifications needed to other items of work that will be required to accommodate Proposed substitution.
      o. Statement on the Substitution's effect on the Construction Schedule.
      p. Written certification by the proposer that the Substitution is equal or better in every respect to that required by the contract Documents and that substitution will perform adequately in the application intended.
      q. Written certification that the proposer will pay for all permits, fees, and costs required to implement the substitution, and including waiver of all claims for additional costs or time extension which may subsequently become apparent, and reimbursement of Owner and Architect for review or redesign services associated with re-approval by authorities.

3.04 ARCHITECT'S REVIEW OF SUBSTITUTIONS

A. The Architect will accept or reject proposed substitutions within fourteen (14) days of receipt of request.

B. If a decision on a substitution cannot be made within the time allocated, the product specified shall be used.

C. No extension of bid period or contract time will be made for substitution review.

D. Final acceptance of a substitution submitted prior to the date established for the receipt of bids will be in the form of an Addendum.

E. Final acceptance of a substitution submitted after the award of the contract will be in the form of a Change Order.

F. Architect/Engineer shall be the judge of the acceptability of the proposed substitution. Architect's decision on substitution requests is final and does not require documentation or justification.

G. Rejection Of Substitution Request: Any of the following reasons shall be cause for rejection, all as determined by the Architect;
   1. Vagueness or incompleteness of Substitution submittal,
   2. Insufficient data, failure to meet specified requirements, (including warranty).
   3. Qualification of the requirements of the Substitution Form, including modification of any

of the requirements.

H. The Architect/Engineer will notify Contractor in writing of decision to accept, accept as noted, or not accept the request for substitution.

I. Substitute products shall not be ordered or installed without written acceptance.

J. Owner shall receive full benefit of any cost reduction as a result of any request for substitution. K. Provide submittals for accepted substitutions in accordance with specified requirements of the respective section and provisions of Section 01-3300.

1. An accepted substitution is not acceptable as a submittal. Provide separate submittals for each review.

3.05 TRANSPORTATION AND HANDLING

A. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.

B. Transport and handle products in accordance with manufacturer's instructions.

C. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.

D. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.

E. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.

F. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

3.06 STORAGE AND PROTECTION

A. Designate receiving/storage areas for incoming products so that they are delivered according to installation schedule and placed convenient to work area in order to minimize waste due to excessive materials handling and misapplication.

B. Store and protect products in accordance with manufacturers' instructions.

C. Store with seals and labels intact and legible.

D. Store sensitive products in weather tight, climate controlled, enclosures in an environment favorable to product.

E. For exterior storage of fabricated products, place on sloped supports above ground.

F. Provide bonded off-site storage and protection only when site does not permit on-site storage or protection. Obtain Owner’s permission prior to initiating such off-site storage.

G. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.

H. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.

I. Prevent contact with material that may cause corrosion, discoloration, or staining.

J. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.

K. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

3.07 PROJECT FORMS

A. Project Forms referenced in this section are bound following Section 01-2700.

END OF SECTION

SECTION 01 6116

VOLATILE ORGANIC COMPOUND (VOC) CONTENT RESTRICTIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. VOC restrictions for product categories listed below under "DEFINITIONS."

B. All products of each category that are installed in the project must comply; Owner's project goals do not allow for partial compliance.

1.02 RELATED REQUIREMENTS

1.03 DEFINITIONS

A. VOC-Restricted Products: All products of each of the following categories when installed or applied on-site in the building interior:
   1. Adhesives, sealants, and sealer coatings.
   2. Paints and coatings.
   3. Insulation.
   4. Gypsum board.
   5. Composite wood and agrifiber products used either alone or as part of another product.
   6. Other products when specifically stated in the specifications.

B. Interior of Building: Anywhere inside the exterior weather barrier.

C. Adhesives: All gunnable, trowelable, liquid-applied, and aerosol adhesives, whether specified or not; including flooring adhesives, resilient base adhesives, and pipe jointing adhesives.

D. Sealants: All gunnable, trowelable, and liquid-applied joint sealants and sealant primers, whether specified or not; including firestopping sealants and duct joint sealers.

1.04 REFERENCE STANDARDS

A. CAL (CHPS LEM) - Low-Emitting Materials Product List; California Collaborative for High Performance Schools (CHPS).

B. CAL (VOC) - Standard Practice for the Testing of Volatile Organic Emissions From Various Sources Using Small-Scale Environmental Chambers (including Addendum 2004-01); State of California Department of Health Services

C. CRI (GLCC) - Green Label Testing Program - Approved Product Categories for Carpet Cushion; Carpet and Rug Institute.

D. CRI (GLP) - Green Label Plus Carpet Testing Program - Approved Products; Carpet and Rug Institute.

E. GEI (SCH) - GREENGUARD "Children and Schools" Certified Products; GREENGUARD Environmental Institute.

F. GreenSeal GC-03 - Anti-Corrosive Paints; Green Seal, Inc.

G. GreenSeal GS-11 - Paints; Green Seal, Inc..

H. GreenSeal GS-36 - Commercial Adhesives; Green Seal, Inc..

I. SCAQMD 1113 - South Coast Air Quality Management District Rule No.1113; current edition; www.aqmd.gov.

J. SCAQMD 1168 - South Coast Air Quality Management District Rule No.1168; current edition; www.aqmd.gov.

K. SCS (CPD) - SCS Certified Products; Scientific Certification Systems.

1.05 SUBMITTALS

A. Evidence of Compliance: Submit for each different product in each applicable category.

B. Product Data: For each VOC-restricted product used in the project, submit product data showing compliance, except when another type of evidence of compliance is required.

C. Installer Certifications for Accessory Materials: Require each installer of any type of product (not just the products for which VOC restrictions are specified) to certify that either 1) no adhesives, joint sealants, paints, coatings, or composite wood or agrifiber products have been used in the installation of his products, or 2) that such products used comply with these requirements.

1.06 QUALITY ASSURANCE

A. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this section.

PART 2 PRODUCTS

2.01 MATERIALS

A. All VOC-Restricted Products: Provide products having VOC content of types and volume not greater than those specified in State of California Department of Health Services Standard Practice for the Testing of Volatile Organic Emissions From Various Sources Using Small-Scale Environmental Chambers.
   1. Evidence of Compliance: Acceptable types of evidence are:
      a. Current GREENGUARD Children & Schools certification; www.greenguard.org.
      b. Current Carpet and Rug Institute Green Label Plus certification; www.carpet-rug.org.
      c. Current SCS Floorscore certification; www.scscertified.com.
      d. Current SCS Indoor Advantage Gold certification; www.scscertified.com.
      e. Product listing in the CHPS Low-Emitting Materials Product List at www.chps.net/manual/lem_table.htm.
      f. Current certification by any other agencies acceptable to CHPS.
      g. Report of laboratory testing performed in accordance with CHPS requirements for getting a product listed in the Low-Emitting Materials Product List; report must include laboratory's statement that the product meets the specified criteria.
   2. Product data submittals showing VOC content are NOT acceptable forms of evidence.
   3. Exception: The product categories listed below are not required to comply with this requirement.

B. Adhesives and Joint Sealants: Provide only products having volatile organic compound (VOC) content not greater than required by South Coast Air Quality Management District Rule No.1168.
   1. Evidence of Compliance: Acceptable types of evidence are:
      a. Report of laboratory testing performed in accordance with requirements.
      b. Published product data showing compliance with requirements.
      c. Certification by manufacturer that product complies with requirements.

C. Joint Sealants: Provide products having VOC content as specified in Section 07-9005.

D. Aerosol Adhesives: Provide only products having volatile organic compound (VOC) content not greater than required by GreenSeal GS-36.
   1. Evidence of Compliance: Acceptable types of evidence are:
      a. Current GreenSeal Certification.
      b. Report of laboratory testing performed in accordance with GreenSeal GS-36 requirements.
      c. Published product data showing compliance with requirements.

E. Paints and Coatings: Provide products having VOC content as specified in Section 09-9000.

F. Paints and Coatings:
   1. Provide coatings that comply with the most stringent requirements specified in the following:

a. 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.
b. Architectural coatings VOC limits of state in which the project is located.
c. USGBC LEED Rating System, edition as stated in Section 01-3515; for interior wall and ceiling finish (all coats), anti-corrosive paints on interior ferrous metal, clear wood stains and finishes, sanding sealers, other sealers, shellac, and floor coatings.
    1) Architectural Paints and Coatings: Do not exceed VOC content limits established in GreenSeal GS-11.
    2) Anti-Corrosive and Anti-Rust Paints: Do not exceed VOC content limits established in GreenSeal GC-03.
    3) Clear Wood Finishes, Floor Coatings, Stains, Primers and Shellacs: Do not exceed the VOC content limits established in SCAQMD Rule No. 1113.

2. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site; or other method acceptable to authorities having jurisdiction.
3. Evidence of Compliance: Acceptable types of evidence are:
    a. Report of laboratory testing performed in accordance with requirements.
    b. Published product data showing compliance with requirements.
    c. Certification by manufacturer that product complies with requirements.

M. Other Product Categories: Comply with limitations specified elsewhere.

PART 3 EXECUTION

3.01 FIELD QUALITY CONTROL

A. Owner reserves the right to reject non-compliant products, whether installed or not, and require their removal and replacement with compliant products at no extra cost to Owner.

B. All additional costs to restore indoor air quality due to installation of non-compliant products will be borne by Contractor.

END OF SECTION

SECTION 01 7000
EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Examination, preparation, and general installation procedures.

B. Requirements for alterations work, including selective demolition, except removal, disposal, and/or remediation of hazardous materials and toxic substances.

C. Products and installation for patching and extending work.

D. Pre-installation meetings.

E. Cutting and patching.

F. Access to Concealed Spaces.

G. Transitions.

H. Surveying for laying out the work.

I. Cleaning and protection.

J. Adjusting: Repair of damaged surfaces, finishes.

K. Existing Systems: Relocation and restoration of function, testing.

L. Closeout procedures, except payment procedures.

1.02 RELATED REQUIREMENTS

A. Section 01-1000 - Summary: Limitations on working in existing building; continued occupancy; work sequence; identification of salvaged and relocated materials.

B. Section 01-3300 - Submittals: Submittals procedures.

C. Section 01-4523 - Testing and Inspection Services.

D. Section 01-5000 - Temporary Facilities: Exterior enclosures, temporary heating, cooling, ventilating facilities.

E. Section 01-7800 - Closeout Submittals: Project record documents, operation and maintenance data, warranties.

F. Individual Product Specification Sections:

1.03 SUBMITTALS

A. See Section 01-3300 - Submittals for submittals procedures.

B. Survey work: Submit name, address, and telephone number of Surveyor before starting survey work.
   1. On request, submit documentation verifying accuracy of survey work.
   2. Submit a copy of site drawing signed by the Land Surveyor, that the elevations and locations of the work are in conformance with Contract Documents.
   3. Submit surveys and survey logs for the project record.

C. Cutting and Patching: Submit written request in advance of cutting or alteration that affects:
   1. Structural integrity of any element of Project.
   2. Integrity of weather exposed or moisture resistant element.
   3. Efficiency, maintenance, or safety of any operational element.
   4. Visual qualities of sight exposed elements.
   5. Work of Owner or separate Contractor.
   6. Include in request:
      a. Identification of Project.
      b. Location and description of affected work.
      c. Necessity for cutting or alteration.

d. Description of proposed work and products to be used.
e. Effect on work of Owner or separate Contractor.
f. Written permission of affected separate Contractor.
g. Date and time work will be executed.

D. Project Record Documents: Accurately record actual locations of capped and active utilities.

1.04 QUALIFICATIONS

A. For survey work, employ a land surveyor registered in California and acceptable to Architect. Submit evidence of Surveyor's Errors and Omissions insurance coverage in the form of an Insurance Certificate.

1.05 PROJECT CONDITIONS

A. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment.

B. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion.

C. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.

D. Dust Control: Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere and over adjacent property.

E. Erosion and Sediment Control: Plan and execute work by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas. Prevent erosion and sedimentation.
1. Minimize amount of bare soil exposed at one time.
2. Provide temporary measures such as berms, dikes, and drains, to prevent water flow.
3. Construct fill and waste areas by selective placement to avoid erosive surface silts or clays.
4. Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.

F. Noise Control: Provide methods, means, and facilities to minimize noise produced by construction operations.

G. Pest and Rodent Control: Provide methods, means, and facilities to prevent pests and insects from damaging the work.

H. Rodent Control: Provide methods, means, and facilities to prevent rodents from accessing or invading premises.

I. Pollution Control: Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations. Comply with federal, state, and local regulations.

1.06 COORDINATION

A. See Section 01-1100 for occupancy-related requirements.

B. Coordinate work of alterations and renovations to expedite completion sequentially and to accommodate occupancy requirements.

C. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.

D. Notify affected utility companies and comply with their requirements.

E. Verify that utility requirements and characteristics of new operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.

F. Coordinate space requirements, supports, and installation of mechanical and electrical work that are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

G. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.

H. Coordinate completion and clean-up of work of separate sections.

I. After Owner occupancy of premises, coordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

PART 2 PRODUCTS

2.01 PATCHING MATERIALS

A. New Materials: As specified in product sections; match existing products and work for patching and extending work.

B. Type and Quality of Existing Products: Determine by inspecting and testing products where necessary, referring to existing work as a standard.

C. Product Substitution: For any proposed change in materials, submit request for substitution described in Section 01-6000.

2.02 FABRICATION

A. Curved Construction: Machine-roll components or elements required to be curved or radiused. Do not field bend or "walk-down". Provide true curves minimizing joints, segmented fabrication not allowed.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.

B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.

C. Verify that demolition is complete in alterations areas and areas are ready for installation of new work.

D. Examine and verify specific conditions described in individual specification sections.

E. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or misfabrication.

F. Verify that utility services are available, of the correct characteristics, and in the correct locations.

G. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

3.02 PREPARATION

A. Clean substrate surfaces prior to applying next material or substance.

B. Seal cracks or openings of substrate prior to applying next material or substance.

C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

3.03 RENOVATION

A. Cut, move, or remove items as necessary for access to alterations and renovation work. Replace and restore at completion.

B. Remove unsuitable material not marked for salvage, such as rotted wood, corroded metals, and deteriorated masonry and concrete. Replace materials as specified for finished work.

C. Remove debris and abandoned items from area and from concealed spaces.

D. Close openings in exterior surfaces to protect existing work and salvage items from weather and extremes of temperature and humidity. Insulate ducts and piping to prevent condensation in exposed areas.

E. Prepare surfaces and remove surface finishes to provide for proper installation of new work and finishes.

3.04 LAYING OUT THE WORK

A. Verify locations of survey control points prior to starting work.

B. Promptly notify Architect of any discrepancies discovered.

C. Contractor shall locate and protect survey control and reference points.

D. Protect survey control points prior to starting site work; preserve permanent reference points during construction.

E. Promptly report to Architect the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.

F. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Architect.

G. Utilize recognized engineering survey practices.

H. Establish elevations, lines and levels. Locate and lay out by instrumentation and similar appropriate means:
   1. Site improvements including pavements; stakes for grading, fill and topsoil placement; utility locations, slopes, and invert elevations.
   2. Grid or axis for structures.
   3. Building foundation, column locations, ground floor elevations.

I. Periodically verify layouts by same means.

J. Maintain a complete and accurate log of control and survey work as it progresses.

3.05 GENERAL INSTALLATION REQUIREMENTS

A. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.

B. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.

C. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.

D. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.

E. Make neat transitions between different surfaces, maintaining texture and appearance.

F. Grind or bush split-faced masonry or textured materials to achieve hairline fit to adjacent trim, flashings, inserts, escutcheons or other penetrating elements.

3.06 ALTERATIONS

A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.
   1. Verify that construction and utility arrangements are as shown.
   2. Report discrepancies to Architect before disturbing existing installation.
   3. Beginning of alterations work constitutes acceptance of existing conditions.

B. Keep areas in which alterations are being conducted separated from other areas that are still occupied.
   1. Provide, erect, and maintain temporary dustproof partitions of construction specified in Section 01-5000 in locations indicated on drawings.

C. Maintain weatherproof exterior building enclosure except for interruptions required for replacement or modifications; take care to prevent water and humidity damage.
   1. Where openings in exterior enclosure exist, provide construction to make exterior enclosure weatherproof.
   2. Insulate existing ducts or pipes that are exposed to outdoor ambient temperatures by alterations work.

D. Remove existing work as indicated and as required to accomplish new work.
   1. Remove rotted wood, corroded metals, and deteriorated masonry and concrete; replace with new construction specified.
   2. Remove items indicated on drawings.
   3. Relocate items indicated on drawings.
   4. Where new surface finishes are to be applied to existing work, perform removals, patch, and prepare existing surfaces as required to receive new finish; remove existing finish if necessary for successful application of new finish.
   5. Where new surface finishes are not specified or indicated, patch holes and damaged surfaces to match adjacent finished surfaces as closely as possible.
   6. Maintain existing fire ratings of assemblies throughout. Patch only with compatible materials.

E. Services (Including but not limited to HVAC, Plumbing, Fire Protection, Electrical, Telecommunications, and Security, including Fire Detection and Alarm): Remove, relocate, and extend existing systems to accommodate new construction.
   1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components; if necessary, modify installation to allow access or provide access panel.
   2. Where existing systems or equipment are not active and Contract Documents require reactivation, put back into operational condition; repair supply, distribution, and equipment as required.
   3. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
      a. Disable existing systems only to make switchovers and connections; minimize duration of outages.
      b. Provide temporary connections as required to maintain existing systems in service.
   4. Verify that abandoned services serve only abandoned facilities.
   5. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings; remove back to source of supply where possible, otherwise cap stub and tag with identification; patch holes left by removal using materials specified for new construction.

F. Protect existing work to remain.
   1. Prevent movement of structure; provide shoring and bracing if necessary.
   2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
   3. Repair adjacent construction and finishes damaged during removal work.
   4. Patch as specified for patching new work.

G. Adapt existing work to fit new work: Make as neat and smooth transition as possible.
   1. When existing finished surfaces are cut so that a smooth transition with new work is not possible, terminate existing surface along a straight line at a natural line of division and make recommendation to Architect.

2. Patch work to match adjacent work in texture and appearance. Where new Work abuts or aligns with existing, perform a smooth and even transition.
3. Where removal of partitions or walls results in adjacent spaces becoming one, rework floors, walls, and ceilings to a smooth plane without breaks, steps, or bulkheads.
4. Where a change of plane of 1/4 inch or more occurs in existing work, submit recommendation for providing a smooth transition for Architect review and request instructions.
5. Trim existing wood doors as necessary to clear new floor finish. Refinish trim as required.

H. Patching: Where the existing surface is not indicated to be refinished, patch to match the surface finish that existed prior to cutting. Where the surface is indicated to be refinished, patch so that the substrate is ready for the new finish.

I. Refinish existing surfaces as indicated:
1. Where rooms or spaces are indicated to be refinished, refinish all visible existing surfaces to remain to the specified condition for each material, with a neat transition to adjacent finishes.
2. If mechanical or electrical work is exposed accidentally during the work, re-cover and refinish to match.
3. Patch as specified for patching new work.

J. Clean existing systems and equipment.

K. Remove demolition debris and abandoned items from alterations areas and dispose of off-site; do not burn or bury.

L. Do not begin new construction in alterations areas before demolition is complete.

M. Comply with all other applicable requirements of this section.

3.07 CUTTING AND PATCHING

A. Whenever possible, execute the work by methods that avoid cutting or patching.

B. See Alterations article above for additional requirements.

C. Perform whatever cutting and patching is necessary to:
1. Complete the work.
2. Fit products together to integrate with other work.
3. Provide openings for penetration of mechanical, electrical, and other services.
4. Match work that has been cut to adjacent work.
5. Repair areas adjacent to cuts to required condition.
6. Repair new work damaged by subsequent work.
7. Remove samples of installed work for testing when requested.
8. Remove and replace defective and non-conforming work.

D. Execute cutting and patching including excavation and fill to complete the work, to uncover work in order to install improperly sequenced work, to remove and replace defective or non-conforming work, to remove samples of installed work for testing when requested, to provide openings in the work for penetration of mechanical and electrical work, to execute patching to complement adjacent work, and to fit products together to integrate with other work.

E. Execute work by methods that avoid damage to other work and that will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.

F. Employ original installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.

G. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.

H. Restore work with new products in accordance with requirements of Contract Documents.

I. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

J. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material in accordance with Section 07-8400, to full thickness of the penetrated element.

K. Patching:
   1. Finish patched surfaces to match finish that existed prior to patching. On continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
   2. Match color, texture, and appearance.
   3. Repair patched surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. If defects are due to condition of substrate, repair substrate prior to repairing finish.

L. Refinish surfaces to match adjacent finish. For continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.

M. Make neat transitions. Patch work to match adjacent work in texture and appearance. Where new work abuts or aligns with existing, perform a smooth and even transition.

N. Patch or replace surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. Repair substrate prior to patching finish. Finish patches to produce uniform finish and texture over entire area. When finish cannot be matched, refinish entire surface to nearest intersections.

3.08 ACCESS TO CONCEALED SPACES

A. Provide door covered access into all attic spaces and at all portions of the work to which access is necessary for periodic inspection, adjustments, or maintenance, and which is enclosed behind finish materials, including, but not limited to, valves, water hammer arrestors, mechanical units, electrical panels and outlets, fire protection equipment and systems.

B. Locations of the access doors and devices requiring access are not shown on the drawings, but are intended to be located in the field by the Contractor as part of the Contractor's duty to route piping and locate equipment and devices. Contractor shall determine all locations requiring access doors and provide them as part of the work, without additional compensation.

3.09 PROGRESS CLEANING

A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.

B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.

C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.

D. Collect and remove waste materials, debris, and trash/rubbish from site periodically and dispose off-site; do not burn or bury.

3.10 PROTECTION OF INSTALLED WORK

A. Protect installed work from damage by construction operations.

B. Provide special protection where specified in individual specification sections.

C. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.

D. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.

E. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.

F. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.

G. Prohibit traffic from landscaped areas.

H. Remove protective coverings when no longer needed; reuse or recycle plastic coverings if possible.

3.11 EXISTING SYSTEMS

A. Examine and test existing building systems and utilities with components requiring relocation during performance of this work. Examples may include but are not limited to:
   1. Mechanical Systems
   2. Plumbing Systems
   3. Electrical Systems, line voltage, low voltage, signal alarm, or data.
   4. Fiber-optic data or communication cabling systems.

B. Remove or relocate these components while work is performed.
   1. Fiber-optic data cabling systems are extremely fragile and subject to mechanical damage. Relocate these systems with great care. Do not disconnect or remove these systems, which must remain in place and in operation during the Work.

C. Restore these components to the former location upon completion of the Work.

D. Test systems under provisions of related sections specifying start-up and adjusting to confirm proper operation. Conduct tests in the presence of the Architect and Owner's Representative.

E. Perform remedial work as necessary to establish proper operation. Assume responsibility for proper operation of systems following completion of Work.

3.12 ADJUSTING

A. Adjust operating products and equipment to ensure smooth and unhindered operation.

B. Testing, adjusting, and balancing HVAC systems: See Section 23-0593.

3.13 FINAL CLEANING

A. Use cleaning materials that are nonhazardous.

B. Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.

C. Remove all labels that are not permanent. Do not paint or otherwise cover fire test labels or nameplates on mechanical and electrical equipment.

D. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.

E. Clean filters of operating equipment.

F. Clean debris from roofs, gutters, downspouts, and drainage systems.

G. Clean site; sweep paved areas, rake clean landscaped surfaces.

H. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury.

3.14 CLOSEOUT PROCEDURES

A. Make submittals that are required by governing or other authorities.

B. Notify Architect when work is considered ready for Substantial Completion.

C. Submit written certification that Contract Documents have been reviewed, work has been inspected, and that work is complete in accordance with Contract Documents and ready for Architect's review.

D. Correct items of work listed in executed Certificates of Substantial Completion and comply with requirements for access to Owner-occupied areas.

E. Notify Architect when work is considered finally complete.

F. Complete items of work determined by Architect's final inspection.

END OF SECTION

SECTION 01 7800
CLOSEOUT SUBMITTALS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Project Record Documents.

B. Operation and Maintenance Data.

C. Spare Parts and Maintenance Products Procedures.

1.02 RELATED REQUIREMENTS

A. Document - General Conditions: Performance bond and labor and material payment bonds, warranty, and correction of work.

B. Section 01 3300 (01330) - Submittal Requirements: Submittals procedures, shop drawings, product data, and samples.

C. Individual Product Sections: Specific requirements for operation and maintenance data, spare parts, maintenance products, keys and similar items.

D. Individual Product Sections: Warranties required for specific products or Work.

1.03 SUBMITTALS

A. Project Record Documents: Submit documents to Architect with final Application for Payment.
   1. Revise and resubmit Record Documents in accordance with Architect's review.
   2. Architect may retain final Application for Payment until Record Documents are corrected.

B. Operation and Maintenance Data:
   1. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work. Architect will review draft and return one copy with comments.
   2. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit completed documents within ten days after acceptance.
   3. Submit one copy of completed documents 15 days prior to final inspection. This copy will be reviewed and returned after final inspection, with Architect comments. Revise content of all document sets as required prior to final submission.
   4. Submit two sets of revised final documents in final form within 10 days after final inspection.

PART 2 PRODUCTS - NOT USED.

PART 3 EXECUTION

3.01 PROJECT RECORD DOCUMENTS

A. Maintain on site one set of the following record documents; record actual revisions to the Work:
   1. Drawings.
   2. Specifications.
   3. Addenda.
   4. Change Orders and other modifications to the Contract.
   5. Reviewed shop drawings, product data, and samples.
   6. Manufacturer's instruction for assembly, installation, and adjusting.

B. Ensure entries are complete and accurate, enabling future reference by Owner.

C. Store record documents separate from documents used for construction.

D. Record information concurrent with construction progress.

E. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
   1. Manufacturer's name and product model and number.
   2. Product substitutions or alternates utilized.
   3. Changes made by Addenda and modifications.

F. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction including:
   1. Measured depths of foundations in relation to finish first floor datum.
   2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
   3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
   4. Field changes of dimension and detail.
   5. Details not on original Contract drawings.
   6. All pre-bid addenda modifications and new drawings shall be posted into the Record Drawing set. Clearly indicate superseded documents to avoid confusion.
   7. Contract Modifications: Request for information response, Architect directives, corrective details, Change Orders and other modifications. Include changed information, type of change, date and person responsible for directing change.
   8. Locations and description of existing features uncovered or discovered during construction including in-ground or in-wall utilities, and including records of utility locator surveys.

G. Submit reproducible documents to Architect prior to final Application for Payment.

H. Receipt and acceptance of Record Documents by the Owner is a condition precedent for filing Notice of Completion.

3.02 OPERATION AND MAINTENANCE DATA

A. For Each Product or System: List names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.

B. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.

C. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawings.

D. Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

3.03 OPERATION AND MAINTENANCE DATA FOR MATERIALS AND FINISHES

A. For Each Product, Applied Material, and Finish:
   1. Product data, with catalog number, size, composition, and color and texture designations.
   2. Information for re-ordering custom manufactured products.

B. Instructions for Care and Maintenance: Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental cleaning agents and methods, and recommended schedule for cleaning and maintenance.

C. Moisture protection and weather-exposed products: Include product data listing applicable reference standards, chemical composition, and details of installation. Provide recommendations for inspections, maintenance, and repair.

D. Additional information as specified in individual product specification sections.

E. Provide a listing in Table of Contents for design data, with tabbed fly sheet and space for insertion of data.

3.04 OPERATION AND MAINTENANCE DATA FOR EQUIPMENT AND SYSTEMS

A. For Each Item of Equipment and Each System:
   1. Description of unit or system, and component parts.
   2. Identify function, normal operating characteristics, and limiting conditions.
   3. Include performance curves, with engineering data and tests.
   4. Complete nomenclature and model number of replaceable parts.

B. Panelboard Circuit Directories: Provide electrical service characteristics, controls, and communications; typed.

C. Include color coded wiring diagrams as installed.

D. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.

E. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and troubleshooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

F. Provide servicing and lubrication schedule, and list of lubricants required.

G. Include manufacturer's printed operation and maintenance instructions.

H. Include sequence of operation by controls manufacturer.

I. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

J. Provide control diagrams by controls manufacturer as installed.

K. Provide Contractor's coordination drawings, with color coded piping diagrams as installed.

L. Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.

M. Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.

N. Include test and balancing reports.

O. Additional Requirements: As specified in individual product specification sections.

3.05 OPERATION AND MAINTENANCE MANUALS

A. Prepare instructions and data by personnel experienced in maintenance and operation of described products.

B. Prepare data in the form of an instructional manual.

C. Binders: Commercial quality, 8-1/2 by 11 inch three D side ring binders with durable plastic covers; 2 inch maximum ring size. When multiple binders are used, correlate data into related consistent groupings.

D. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of Project; identify subject matter of contents.

E. Provide tabbed dividers for each separate product and system, with typed description of product and major component parts of equipment.

F. Text: Manufacturer's printed data, or typewritten data on 24 pound paper.

G. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.

H. Arrange content by systems under section numbers and sequence of Table of Contents of this Project Manual.

I. Contents: Prepare a Table of Contents for each volume, with each product or system description identified, in three parts as follows:
   1. Part 1: Directory, listing names, addresses, and telephone numbers of Architect, Contractor, Subcontractors, and major equipment suppliers.
   2. Part 2: Operation and maintenance instructions, arranged by system and subdivided by specification section. For each category, identify names, addresses, and telephone numbers of Subcontractors and suppliers. Identify the following:
      a. Significant design criteria.
      b. List of equipment.
      c. Parts list for each component.
      d. Operating instructions.
      e. Maintenance instructions for equipment and systems.
      f. Maintenance instructions for special finishes, including recommended cleaning methods and materials, and special precautions identifying detrimental agents.

g. Copies of Receipts for spare parts, maintenance products and keys, attested by the Owner.

3. Part 3: Project documents and certificates, including the following:
   a. Shop drawings and product data.
   b. Air and water balance reports.
   c. Certificates.
   d. Photocopies of warranties and bonds.

J. Provide a listing in Table of Contents for design data, with tabbed dividers and space for insertion of data.

K. Table of Contents: Provide title of Project; names, addresses, and telephone numbers of Architect, Consultants, and Contractor with name of responsible parties; schedule of products and systems, indexed to content of the volume.

L. Submit 1 draft copy of completed volumes. This copy will be reviewed and returned with Architect comments. Revise content of all document sets as required prior to final submission.

M. Submit two sets of revised final volumes, within 10 days after final inspection.

N. Receipt and acceptance of Operations and Maintenance Documents by the Owner is a condition precedent for filing Notice of Completion.

3.06 NOT USED.

3.07 SPARE PARTS AND MAINTENANCE PRODUCTS

A. Submit spare parts, maintenance products, keys and supplemental materials specified in pertinent related sections.

B. Submit original Receipts for delivery of these items, including location of storage, attested by the Owner by signature.

END OF SECTION

SECTION 02 4100

DEMOLITION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Selective demolition of built site elements.

B. Selective demolition of building elements for alteration purposes.

1.02 RELATED REQUIREMENTS

A. Drawings and general provisions of Contract, including Division 1 Specifications, apply to this section.

1.03 SUBMITTALS

A. Site Plan: Showing:
   1. Areas for temporary construction and field offices.

B. Project Record Documents: Accurately record actual locations of capped and active utilities and subsurface construction.

PART 3 EXECUTION

2.01 SCOPE

A. Remove paving and curbs as required to accomplish new work.

B. Remove other items indicated, for salvage, relocation and recycling.

2.02 GENERAL PROCEDURES AND PROJECT CONDITIONS

A. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
   1. Obtain required permits.
   2. Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.
   3. Provide, erect, and maintain temporary barriers and security devices.
   4. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
   5. Do not close or obstruct roadways or sidewalks without permit.
   6. Conduct operations to minimize obstruction of public and private entrances and exits; do not obstruct required exits at any time; protect persons using entrances and exits from removal operations.
   7. Obtain written permission from owners of adjacent properties when demolition equipment will traverse, infringe upon or limit access to their property.

B. Do not begin removal until receipt of notification to proceed from Owner.

C. Protect existing structures and other elements that are not to be removed.
   1. Provide bracing and shoring.
   2. Prevent movement or settlement of adjacent structures.
   3. Stop work immediately if adjacent structures appear to be in danger.

D. Partial Removal of Paving and Curbs: Neatly saw cut at right angle to surface.

2.03 EXISTING UTILITIES

A. Coordinate work with utility companies; notify before starting work and comply with their requirements; obtain required permits.

B. Protect existing utilities to remain from damage.

C. Do not disrupt public utilities without permit from authority having jurisdiction.

D. Do not close, shut off, or disrupt existing life safety systems that are in use without at least 7 days prior written notification to Owner.

E. Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without at least 3 days prior written notification to Owner.

F. Locate and mark utilities to remain; mark using highly visible tags or flags, with identification of utility type; protect from damage due to subsequent construction, using substantial barricades if necessary.

G. Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities.

2.04 SELECTIVE DEMOLITION FOR ALTERATIONS

A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.
   1. Verify that construction and utility arrangements are as shown.
   2. Report discrepancies to Architect before disturbing existing installation.
   3. Beginning of demolition work constitutes acceptance of existing conditions that would be apparent upon examination prior to starting demolition.

B. Remove existing work as indicated and as required to accomplish new work.
   1. Remove items indicated on drawings.

C. Services (Including but not limited to HVAC, Plumbing, Fire Protection, Electrical, Telecommunications): Remove existing systems and equipment as indicated.
   1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components.
   2. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
   3. Verify that abandoned services serve only abandoned facilities before removal.
   4. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings; remove back to source of supply where possible, otherwise cap stub and tag with identification.

D. Protect existing work to remain.
   1. Prevent movement of structure; provide shoring and bracing if necessary.
   2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
   3. Repair adjacent construction and finishes damaged during removal work.
   4. Patch as specified for patching new work.

2.05 DEBRIS AND WASTE REMOVAL

A. Remove debris, junk, and trash from site.

B. Leave site in clean condition, ready for subsequent work.

C. Clean up spillage and wind-blown debris from public and private lands.

END OF SECTION

SECTION 03 0505
UNDERSLAB VAPOR BARRIER

PART 1 GENERAL

1.00 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including Division 1 Specification Sections, apply to this section.

1.01 SECTION INCLUDES

A. Sheet vapor barrier under concrete slabs on grade.

1.02 REFERENCE STANDARDS

A. ASTM E1643 - Standard Practice for Selection, Design, Installation and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs; 2011.

B. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs; 2011.

1.03 SUBMITTALS

A. See Section 01 3300 - Administrative Requirements, for submittal procedures.

B. Product Data: Submit manufacturers' data on manufactured products.

C. Samples: Submit samples of underslab vapor barrier to be used.

D. Manufacturer's Installation Instructions: Indicate installation procedures and interface required with adjacent construction.

PART 2 PRODUCTS

2.01 MATERIALS

A. Underslab Vapor Barrier:
   1. Water Vapor Permeance: Not more than 0.010 perms (0.6 ng/(s m2 Pa)), maximum.
   2. Complying with ASTM E1745 Class A.
   3. Thickness: 15 mils (0.4 mm).
   4. Basis of Design:
      a. Stego Industries LLC; Stego Wrap Vapor Barrier (15-mil): www.stegoindustries.com.

B. Accessory Products: Vapor barrier manufacturer's recommended tape, adhesive, mastic, etc., for sealing seams and penetrations in vapor barrier.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surface over which vapor barrier is to be installed is complete and ready before proceeding with installation of vapor barrier.

3.02 INSTALLATION

A. Install vapor barrier in accordance with manufacturer's instructions and ASTM E1643.

B. Install vapor barrier under interior slabs on grade; lap sheet over footings and seal to foundation walls.

C. Lap joints minimum 6 inches (150 mm).

D. Seal joints, seams and penetrations watertight with manufacturer's recommended products and follow manufacturer's written instructions.

E. No penetration of vapor barrier is allowed except for reinforcing steel and permanent utilities.

F. Repair damaged vapor retarder before covering with other materials.

END OF SECTION

SECTION 07 2100
THERMAL INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Board insulation and integral vapor retarder over roof deck.

B. Batt insulation and vapor retarder in exterior wall, ceiling, and roof construction.

C. Batt insulation for filling perimeter window and door shim spaces and crevices in exterior wall and roof.

1.02 RELATED REQUIREMENTS

A. Section 07 2500 - Weather Barriers: Separate air barrier and vapor retarder materials.

B. Section 07 5300 – Combination Built Up Roofing: Insulation specified as part of roofing system.

C. Section 07 5300 – Combination Built Up Roofing: Installation requirements for board insulation over low slope roof deck specified in this section.

D. Drawings and general provisions of Contract, including Division 1 Specification Sections, apply to this section.

1.03 REFERENCE STANDARDS

A. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2012.

B. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board; 2014.

C. ASTM E136 - Standard Test Method for Behavior of Materials in a Vertical Tube Furnace At 750 Degrees C; 2012.

1.04 SUBMITTALS

A. See Section 01 3300 - Administrative Requirements, for submittal procedures.

1.05 FIELD CONDITIONS

A. Do not install insulation adhesives when temperature or weather conditions are detrimental to successful installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

2.02 FOAM BOARD INSULATION MATERIALS

A. Composite Polyisocyanurate Board Insulation Faced with Oriented Strand Board (OSB) or Plywood: Rigid cellular foam, complying with ASTM C1289; Type V, oriented strand board (OSB) one face, glass fiber mat face one side, Grade 2.
   1. Top Layer Material: 7/16 inch (11 mm) oriented strand board (OSB).

2.03 BATT INSULATION MATERIALS

A. Glass Fiber Batt Insulation: Flexible preformed batt or blanket, complying with ASTM C665; friction fit.
   1. Combustibility: Non-combustible, when tested in accordance with ASTM E136, except for facing, if any.
   2. Facing: Aluminum foil, flame spread 25 rated; one side.
   3. Manufacturers:
      a. CertainTeed Corporation: www.certainteed.com.
      b. Johns Manville Corporation: www.jm.com.
      c. Owens Corning Corporation; EcoTouch PINK FIBERGLAS Insulation: www.ocbuildingspec.com.

2.04 ACCESSORIES

A. Sheet Vapor Retarder: Specified in Section 07 2500.

B. Sheet Vapor Retarder: Black polyethylene film for above grade application, 10 mil (0.25 mm) thick.

C. Tape: Bright aluminum self-adhering type, mesh reinforced, 2 inch (50 mm) wide.

D. Tape joints of rigid insulation in accordance with roofing and insulation manufacturers' instructions.

E. Insulation Fasteners: Impaling clip of unfinished steel with washer retainer and clips, to be adhered to surface to receive insulation, length to suit insulation thickness and substrate, capable of securely and rigidly fastening insulation in place.

F. Adhesive: Vapor retarder type, trowel consistency; fire retardant, compatible with insulation and substrate, conforming to the following:

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate, adjacent materials, and insulation materials are dry and that substrates are ready to receive insulation and adhesive.

B. Verify substrate surfaces are flat, free of irregularities or materials or substances that may impede adhesive bond.

3.02 BOARD INSTALLATION OVER LOW SLOPE ROOF DECK

3.03 BATT INSTALLATION

A. Install insulation and vapor retarder in accordance with manufacturer's instructions.

B. Install in exterior wall and roof spaces without gaps or voids. Do not compress insulation.

C. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.

D. Fit insulation tightly in cavities and tightly to exterior side of mechanical and electrical services within the plane of the insulation.

END OF SECTION

SECTION 07 2500
WEATHER BARRIERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Vapor Retarders: Materials to make slabs-on-grade water vapor-resistant and air tight.

1.02 RELATED REQUIREMENTS

A. Section 07-9005 - Joint Sealers: Sealant materials and installation techniques.

B. Concrete specifications/details in construction documents

C. Section 09-2400 Plaster Assemblies

D. Drawings and general provisions of Contract, including Division 1 Specification Sections, apply to this section.

1.03 DEFINITIONS

A. Vapor Retarder: Air tight barrier made of material that is relatively water vapor impermeable, to the degree specified, with sealed seams and with sealed joints to adjacent surfaces.
   1. Water Vapor Permeance: For purposes of conversion, 57.2 ng/(Pa s sq m) = 1 perm.

1.04 REFERENCE STANDARDS

A. ACI 302.2R-06 - Guide for Concrete Slabs that Receive Moisture Sensitive Flooring Materials, American Concrete Institute Committee 302, 2006 edition.

B. ASTM D 882 - Tensile Properties of Thin Plastic Sheeting.

C. Manufacturer's recommendations and specifications.

D. ASTM D 1709 - Standard Specification for Impact Resistance of Plastic Film by the Free-Falling Dart Method.

E. ASTM E96/E96M - Standard Test Methods for Water Vapor Transmission of Materials.

F. ASTM E 154 Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover (Section 7); 2008.

G. ASTM E 1643 - Standard Practice for Installation of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs; 1998, updated 2005.

H. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs.

I. ASTM F 1249-06 Standard Test Method for Water Vapor Transmission Rate Through Plastic Film and Sheeting Using a Modulated Infrared Sensor; 2006.

1.05 SUBMITTALS

A. See Section 01-3300 - Submittal Procedures.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.
   4. Independent laboratory test results demonstrating conformance to specified performance criteria.

C. Shop Drawings: Provide drawings of special joint conditions, placement, seaming, penetration and pipe boot installation.

D. Verification Samples: For each product specified, submit samples representing actual product, color, and patterns, minimum size 6 inches square.

E. Manufacturer's Installation Instructions: Indicate preparation.

1.06 QUALITY ASSURANCE

A. Demonstrate compliance with ASTM E 1745 performance class specified.

B. Preinstallation Meeting: Convene a preinstallation meeting two weeks before start of installation of reinforced vapor retarders. Require attendance of parties directly affecting work of this section, including Contractor, Architect, and installer. Review installation, protection, and coordination with other work.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.

B. Storage:
   1. Store products in manufacturer's unopened packaging until ready for installation.
   2. Store materials in a clean, dry area in accordance with manufacturer's instructions.

C. Handling: Protect materials during handling and installation to prevent damage.

PART 2 PRODUCTS

2.01 VAPOR RETARDER MEMBRANE

A. Manufacturers: Products by the following are acceptable;
   1. FortiFiber Building Systems Group, Reno NV, 800-773-4777, www.fortifber.com. Product "Moistop Ultra® 15".
   2. Stego Industries, LLC, San Juan Capistrano, CA. Tel: 877-464-7834; www.stegoindustries.com. Product "Stego Wrap Vapor Barrier".
   3. W. R. Meadows, Inc., Hampshire, IL 60140, 847-214-2100; www.wrmeadows.com, Product "Perminator Underslab Vapor Barrier".
   4. Substitutions: See Section 01-6000 - Product Requirements.

B. Vapor Retarder Membrane: Meet or exceed ASTM E 1745 Class A. Specific values and products noted below are for Stego Wrap Vapor Barrier.
   1. Material: Prime virgin polyolefin resin.
   2. Thickness: 15 mil.
   3. Water Vapor Transmission Rate: 0.006gr./sq. ft./hour or lower when tested in accordance with ASTM E 96.
   4. Permeance (Perm): Comply with ACI 302-2006 requirements for Vapor Barrier after aging requirements of ASTM E1745; Less than 0.01 perms when tested in accordance with ASTM E 96. Exceeds ASTM E 1745 Class A (0.3 perms).
   5. Drop Dart: 2200 g, when tested in accordance with ASTM D 1709 Method A, 2445 g Method B.
   6. Tensile Strength: 76.6 lbf/in., when tested in accordance with ASTM D 882, 3 inch wide specimen. Exceeds ASTM E 1745 Class A (45.6 lbf/in.).
   7. Life Expectancy: ASTM E154, indefinite.
   8. Chemical Resistance: ASTM E 154, unaffected.

C. Accessories:
   1. Seam Tape: "Stego Tape"; type recommended by vapor retarder membrane manufacturer, with Water Vapor Transmission rate 0.3 perms or lower per ASTM E 96.
   2. Vapor Proofing Mastic: "Stego Mastic", type recommended by vapor retarder membrane manufacturer, with Water Vapor Transmission Rate 0.3 perms or lower per ASTM E 96.
   3. Pipe Boots: Field fabricated from vapor barrier membrane material, tape and/or mastic in accordance with vapor retarder membrane manufacturer's written instructions and recommended details to suit conditions.
   4. Adhesives, sealants and plastic cement: Types recommended by vapor retarder membrane manufacturer to suit application and for compliance with referenced standards.
   5. Thinners and Cleaners: As recommended by material manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces and conditions are ready to accept the work of this section.

B. Do not begin installation until unacceptable conditions have been corrected. Commencement of work will imply acceptance of substrate.

3.02 INSTALLATION - GENERAL

A. Install materials in accordance with manufacturer's instructions.

B. Vapor Retarders: Install continuous air tight barrier over surfaces indicated, with sealed seams and with sealed joints to adjacent surfaces.

C. Apply sealants and adhesives within recommended application temperature ranges. Consult manufacturer if temperature is out of this range.

3.03 INSTALLATION - VAPOR RETARDER UNDER SLAB.

A. Install vapor retarders in accordance with manufacturer's instructions and ASTM E 1643 at concrete slabs. Ensure surface beneath vapor retarder is smooth with no sharp projections.

B. Install vapor retarders continuously at locations as indicated on the drawings. Ensure there are no discontinuities in vapor retarder at seams and penetrations.

C. Sheet dampproofing under slabs: Install in accordance with referenced standards and the following,
   1. Lap seams 6 inches minimum join sections and seal penetrations with continuous mastic tape or adhesive. Ensure vapor retarder surfaces to receive mastic tape are clean and dry.
   2. Turn onto foundation walls, lap face of wall at least 6 inches and seal.
   3. Protect vapor retarder membrane from damage during installation of concrete, reinforcement, utilities, and other work above the membrane.
   4. Immediately repair holes in vapor retarder with self-adhesive repair tape or mastic, as recommended by membrane manufacturer.
   5. No penetrations through membrane other than specified utilities or building elements. Support screeds by methods which will not puncture or penetrate the membrane.
   6. Seal membrane to pipes and permanent penetrations with tape and mastic.
   7. Prior to covering membrane, check all seams and penetrations for interruptions. Check entire surface for snags, holes or penetrations and repair in accordance with manufacturer details.

D. Edge dampproofing: install mastic at edges and intersections in accordance with referenced standards.

E. Apply sealants and adhesives within recommended application temperature ranges. Consult manufacturer when temperature is out of this range.

3.04 FIELD QUALITY CONTROL

A. Do not cover installed weather barriers until required inspections have been completed.

3.05 PROTECTION

A. Do not leave materials exposed to weather longer than recommended by manufacturer.

B. Protect vapor retarders from damage during installation of reinforcing steel and utilities and during placement of granular materials or concrete slab.

C. Allow 24 hour cure period for sealants and mastics prior to placement of concrete.

END OF SECTION

SECTION 07 5300

COMBINATION BUILT-UP ROOFING

PART 1 – GENERAL

1.00 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including Division 1 Specification Sections, apply to this section.

1.01 DESCRIPTION

A. Provide all labor, equipment, and materials to install a combination Built-Up Roof System utilizing polyester plies surfaced with a thermoplastic Elvaloy membrane over the properly prepared substrate. Scope of work shall include but not be limited to:
   1. Over the entire roof field, provide and install fiberglass faced gypsum board designed for use with hot asphalt bitumen.
   2. Provide and install two (2) plies of polyester felt designed for BUR installations in hot asphalt bitumen.
   3. Provide and install the specified fleece-backed, thermoplastic Elvaloy membrane set in hot asphalt bitumen.

B. In the event these Specifications deviate from the EIP Single Ply Roofing Manufacturer's (SPR Manufacturer's) current specifications, these specifications shall prevail, except where they conflict with the SPR Manufacturer's requirements for the required warranty. In this case, the SPR Manufacturer's specifications shall prevail.

C. The EIP Single Ply Roofing System as specified shall only be installed by a state certified roofing contractor, authorized in writing by the SPR Manufacturer prior to installation.

D. Drawings, addenda and modifications may be issued subsequent to the printing of these specifications. The Authorized Roofing Contractor shall ascertain that such amendments to these Specifications are workable alterations.

E. Prior to the project start, the Authorized Roofing Contractor shall determine that all aspects of these Specifications and possible modifications are workable and do not conflict with the SPR Manufacturer's requirements for the specified warranty.

F. Upon commencement of the work, the Authorized Roofing Contractor assumes the responsibility for confirmation that these Specifications and drawings, addenda and modifications are satisfactory to the SPR Manufacturer.

G. The Authorized Roofing Contractor shall supply all materials required for a complete EIP Membrane Roofing System, including accessory products.

H. The General Contractor / Authorized Roofing Contractor in presenting a bid or proposal, represents that the price is predicated upon the use of materials listed in PART 2 - PRODUCTS.

1.02 RELATED SECTIONS

A. Section 07595 (07-0150.19) - Preparation for Re-Roofing.

B. Section 07620 (07-6200) - Flashing and Sheet Metal.

C. Work of other sections that relate to or penetrate the roof.

1.03 REFERENCES

A. American Society for Testing and Materials (ASTM):
   1. ASTM C 728 - Standard Specification for Perlite Thermal Insulation Board; 1994.
   2. D 41 - Standard Specification for Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing.
   3. D 751 - Standard Test Methods for Coated Fabrics.
   4. D 312 - Standard Specification for Asphalt Used in Roofing.
   5. E 96 -Test Methods for Water Vapor Transmission in Sheet Form.
   6. E 108 - Standard Test Methods for Fire Testing of Roof Coverings.

B. Federal Specifications (FS):
   1. FS 101B, Method 2031 - Tear Strength

C. Factory Mutual Engineering and Research (FM)

D. Factory Mutual Test Standard 4470

E. Minimum 1-90 windstorm classification

F. FM Loss Prevention Data Sheet 1-49

G. FM Loss Prevention Data Sheet 1-28

H. FM Loss Prevention Data Sheet 1-28S

I. FM Loss Prevention Data Sheet 1-29S

J. Underwriters Laboratories, Inc. (UL) or other testing laboratory approved by the California State Fire Marshal.
   1. UL 790: Tests for Fire Resistance of Roof Covering Materials
   2. UL Fire Resistance Directory

K. American Society of Civil Engineers (ASCE):

L. ASCE Standard 7-93

M. The NRCA Roofing and Waterproofing Manual; National Roofing Contractors Association; Fourth Edition.

1.04 SYSTEM DESCRIPTION

A. Asphalt adhered, Energy Star certified, high-performance EIP Thermoplastic Membrane Roofing System manufactured and supplied by Seaman Corporation or Flex Membrane International (see Part 2 – Products):

1.05 SUBMITTALS

A. Product Data:
   1. Submit latest edition of SPR Manufacturer's roofing and flashing specifications including a list of materials proposed for use, installation procedures, and SPR Manufacturer's data sheets for all products comprising roof system assembly as required to demonstrate compliance with specified requirements.
   2. Submit complete material list, Material Safety Data Sheets and installation procedures for all items not furnished by SPR Manufacturer, proposed to be furnished and installed under this section.
   3. When approved by the owner or owner's representative, the SPR Manufacturer's recommended methods of installation (unless superseded by the specification) will become the basis for inspecting and acceptance or rejection of the actual installation procedures used on this work.
   4. Submit Material Safety Data Sheets (MSDS) for all liquids, adhesives and sealants to be used on the project.
   5. Certified test reports indicating compliance with performance requirements and regulatory requirements specified herein.

B. Samples:
   1. Submit three 5 inch by 9 inch samples of approved EIP Roofing Membrane with welded splice joint.
   2. Submit three samples of each of the following:
      a. Mechanical fasteners (each type.)
      b. 6 inch by 6 inch gypsum board.
      c. Termination fastening devices.
      d. Other samples as may be requested by the owner.

C. Certificates:
   1. Submit certification that materials and components furnished for EIP Membrane Roofing System are products of single manufacturer or products acceptable to SPR Manufacturer.
   2. Submit certification that all materials furnished are compatible with one another and specific decking and are suitable for their intended use.
   3. Upon completion of work, submit SPR Manufacturer's Certificate of Final Inspection.
   4. Submit Authorized Roofing Contractor's Statement of Qualifications.

D. SPR Manufacturer's Reports:
   1. Submit SPR Manufacturer's review and approval of project shop drawings (as required.)
   2. Submit SPR Manufacturer's acceptance of warranty conditions.

E. Warranty: Submit samples of the SPR Manufacturer's and Authorized Roofing Contractor's warranties.

F. Maintenance Data: Submit SPR Manufacturer's recommended maintenance procedures for roofing system, including precautions and warnings to prevent damage and deterioration to the EIP Roofing Membrane and roof system accessories.

1.06 QUALITY ASSURANCE

A. Qualifications of SPR Manufacturer:
   1. EIP Roofing Membrane used in the work included in this section shall be produced by a highly reputable EIP SPR Manufacturer, regularly engaged, without interruption, in the manufacture of the specified EIP Membrane.
   2. EIP Roofing Membrane used in the work must be manufactured / produced using a high percentage of EIP compound without extractable (liquid) plasticizer.
   3. EIP Roofing Membrane must have a successful performance record on similar roofing projects that can be documented for periods of at least 15 – 20 years.
   4. EIP Roofing Membrane must have been manufactured and commercially sold, without a significant formulation change, for a minimum of fifteen (15) years.

B. Authorized Roofing Contractor Qualifications:
   1. Firm experienced in application or installation of systems similar in complexity to those required for this project.
   2. Authorized, in writing, by SPR Manufacturer prior to installation.
   3. Successful completion of a minimum five (5) projects of comparable scale and complexity within last two (2) years.
   4. An adequate number of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work in this section.
   5. A new and complete roofing installation is required by these specifications. An installation with an excess number of patches, splices, or small pieces will not be accepted. Such an installation shall be completely removed and replaced with the specified quality of workmanship at no additional costs to the Owner.

C. Project Acceptance:
   1. Authorized Roofing Contractor shall submit a completed and approved SPR Manufacturer's request for warranty form along with shop drawings of the roof(s) showing all dimensions, penetrations and details.
      a. The request for warranty form shall contain all pertinent information applicable to the project including:
      b. Deck type(s)
      c. Gypsum board type.
      d. Fastener type(s)
      e. Membrane assembly and type.

D. Product / Material Qualifications:
   1. Test Reports:
      a. Class A Fire Hazard Classification
      b. FM 1-90 Windstorm Classification
   2. Gypsum Board: Approved in writing by SPR Manufacturer as acceptable substrate for this Project.
   3. Use only those materials and methods of installation specifically approved by SPR Manufacturer.

E. Regulatory Requirements:
   1. The Roofing Contractor shall conform to regulations of public agencies, including specific requirements of the city, county, or state of jurisdiction.
   2. FM 1-90 Windstorm Classification

3. Class A Fire Hazard Classification

F. Pre-Installation Conference:
   1. Convene approximately two (2) weeks prior to commencement of the installation of the specified roof system.
   2. Authorized Roofing Contractor shall notify Owner and SPR Manufacturer's technical representative approximately ten(10) days prior to pre-installation conference.
   3. Meet at Project site with Installer, installer of each component of associated work, installers of deck or substrate construction to receive roofing work, installers of rooftop units and other work in the around roofing that must precede or follow roofing work (including mechanical work if any), Architect/Owner, roofing system manufacturer's representative, and other representatives directly concerned with performance of the Work, including (where applicable) Owner's insurers, test agencies, and governing authorities. Objectives to include:
      a. Review methods and procedures related to roofing work.
      b. Review structural loading limitations of roof deck.
      c. Review roofing systems requirements (drawings, specifications, and other contract documents).
      d. Review required submittals, both completed and yet to be completed.
      e. Review and finalize construction schedule related to roofing work and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
      f. Review required inspection, testing, certifying, and material usage accounting procedures.
      g. Review weather and forecasted weather conditions and procedures for coping with unfavorable conditions, including provision of temporary roofing over occupied spaces.
      h. Record discussion of conference, including decisions and agreements (or disagreements) reached, and furnish copy of record to each party attending. If substantial disagreements exist at conclusion of conference, determine how disagreements will be resolved and set date for reconvening conference.
      i. Review notification procedures for weather or non-working days.

1.07 DELIVERY, STORAGE AND HANDLING

A. Delivery
   1. Deliver all packaged materials to the job site in their original, unopened container with all labels intact and legible.
   2. Labels shall contain manufacturer's material name, date of manufacturer and lot number.

B. Storage and Protection
   1. All materials shall be stored raised above the deck or ground and covered with tarps or similar "breathable" covers. Covering shall be secured to resist wind and weather. Factory wrappings or clear polyethylene film shall not be used as sole coverings. (Note: Job site storage area(s) shall be designated at the Pre-Installation Conference.)
   2. All adhesives, primers and caulking shall be stored between 50 degrees F. and 80 degrees F. Primers, caulking and adhesives exposed to freezing temperatures shall not be used and shall be removed from the job site.
   3. Use all necessary means to protect the materials in this section before, during and after installation.
   4. All materials that become wet, broken, damaged or otherwise unsuitable for use in a top quality installation, shall be promptly marked and removed from the site. Work found to be installed using damaged materials shall be removed and replaced at the Roofing Contractor's expense.

1.08 PROJECT CONDITIONS

A. Environmental Requirements:
   1. EIP Thermoplastic Roof Membrane, flashing, gypsum board and adhesives shall not be applied when the surrounding air and surface temperature, relative humidity, or wind velocity is not within the range acceptable under the SPR Manufacturer's recommendations.
   2. Cements and adhesives shall not be exposed to temperatures lower than 50 degrees F. for more than four hours, or such other minimums published by respective manufacturers.

B. Maintain materials and equipment, on-site, in sufficient quantity necessary to apply emergency, temporary edge seals or covers in the event of sudden storms or inclement weather.

C. Coordinate with roof accessories, miscellaneous sheet metal accessory items, including piping vents and other devices to be coordinated with the roofing work as specified in other sections to avoid conflict or omission in waterproofing systems and to provide watertight installation.

1.09 SEQUENCING AND SCHEDULING

A. Perform roofing and flashing work as a single integrated unit of work, without division of responsibility between separate installers.

B. Install new EIP Membrane Roofing System as soon as possible after gypsum board and base layer installation.

C. All gypsum board shall be covered with BUR base layers at the end of each work day.

D. In the event of unforeseen inclement weather, installed gypsum board shall be covered with temporary waterproofing covers.

E. Authorized Roofing Contractor shall complete roofing work on a daily basis with each section completed before progressing to the next day's work, unless specifically directed otherwise by the owner's representative.

F. Completion of work shall be defined as the installation of all specified roof preparation, gypsum board, field membrane, membrane flashing and caulking (when required).

1.10 SYSTEM PERFORMANCE CRITERIA

A. Design installation for a wind velocity at the site of 90 mph. following ASCE 7-93.

B. Installation shall achieve a Class A fire rating.

1.11 WARRANTY

A. As part of the work of this section, pay all required fees, secure all required inspections, and complete all items necessary to secure and deliver to the owner the SPR Manufacturer's 20-year, labor-and-material warranty.

B. SPR Manufacturer shall provide a "system warranty" for a period of twenty(20) years from Date of Substantial Completion; Roofing Contractor shall provide concurrent two(2) year warranty.

C. Warranty shall be limited to repairs, or replacement, as required to maintain the EIP Roofing System in a watertight condition.

D. Exclusions, listed under Terms and Conditions of the Warranty, shall conform to generally accepted industry standards except for the following:
   1. Warranty shall contain no exclusion for "gale" force winds.
   2. Warranty shall contain no exclusion for ponding water.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Specified Roof System / Manufacturer: FB Plus (EIP) Membrane Roof System by Flex Membrane International or Asphalt adhered FiberTite – FB (EIP) Membrane Roof System by Seaman Corporation.

B. Obtain primary EIP Thermoplastic Roofing Membrane from a single manufacturer and provide secondary materials only as recommended by manufacturer of primary material specified.

C. Substitutions: Per Section 01600.

2.02 GYPSUM BOARD AND RELATED ROOFING COMPONENTS

A. Polyester Ply Sheets: Heat stabilized roofing membrane that has been pre-dipped into and coated with hot roofing grade asphalt bitumen to form a highly absorbent, high strength ply sheet for use in built-up roofing. ASTM D-4632.

B. Type III Asphalt (Steep): ASTM D-312, Type III / Federal Specification #SS-A-666.

C. Asphalt Primer: ASTM D-41 / Federal Specification #SS-A-701B.

D. Gypsum Roof Board: 1/4 inch, fiberglass faced “Dens-Dek Prime” by Georgia Pacific.

2.03 EIP THERMOPLASTIC ROOFING MEMBRANE

A. Asphalt installed EIP Thermoplastic Roofing Membrane shall be a polyester reinforced Ethylene Interpolymer (EIP) Alloy coated membrane with a minimum thickness of .045 mils.

2.04 FLASHING MATERIALS

A. All membrane flashing materials shall be supplied by the SPR Manufacturer.

B. Membrane flashing materials: Same material as the roofing membrane without the fleece backing.

C. Flashing metal shall be coated metal (Clad Metal) supplied by the SPR Manufacturer, unless specifically authorized by the SPR Manufacturer in writing.

D. Drain flashing: Non-reinforced EIP Membrane, minimum thickness of .045 mils.

E. Flashing for butt seams in the roof field: Standard EIP Membrane, .045 mils. and six(6)-inch wide.

2.05 ACCESSORIES

A. The following products shall be supplied by the SPR Manufacturer and shall be incorporated into the roof assembly where noted in project details and approved shop drawings.
   1. Bonding Adhesive: A solvent-based contact adhesive, designed for bonding thermoplastic membrane to pre-approved horizontal and vertical surfaces.
   2. Sealant: To seal flashing termination(s), a one-component gun-grade polyurethane sealant.
   3. SL Sealant: A topping to seal "pitch pans", a one component pourable, self-leveling, polyurethane sealant.
   4. Clad Metal: To fabricate metal flashing, 4 foot x 8 foot sheets of 24 gauge hot dipped G-90 steel, laminated with a 0.020 mil polymeric coating.
   5. Pre-Molded Flashing: Vent stack and inside/outside corner flashing, thermal-formed from non-reinforced EIP Membrane.
   6. Pre-Cut Butt Seam Flashing (Trim Strip): Standard EIP Single Ply Membrane, .045 mils, (6-inches in width).
   7. Non-Reinforced Membrane: Field fabrication membrane, .045 mil (minimum) non-reinforced EIP Membrane.
   8. Protection Pads: High grade vinyl walk protection material with ribbed "slip resistant" design.
   9. Fastening Devices:
      a. Termination Bar: Membrane flashing restraint / termination / compression seals, nominal 1/8 inch x 1 inch x 10 foot 6060-T5 extruded aluminum bar with pre-punched slots, 8 inches on center, as supplied by SPR Manufacturer.
      b. Insulation Fasteners and Plates: Fasteners and plates (3-inch metal plates.)

2.06 RELATED MATERIALS

A. Wood Nailers: Treated wood nailers shall be installed where indicated and where applicable.
   1. Wood nailers shall be #2 quality or better lumber, kiln dried, fire retardant, and conforming to Federal Specification TT-550, TT-W-517 and American Wood Preservers Institute Standard LP-2. Creosote or asphaltic-treated wood is not acceptable.
   2. All wood nailers shall have a maximum moisture content of 19 percent by weight on a dry basis at time of installation.

PART 3 – EXECUTION

3.01 EXAMINATION OF SURFACES

A. The Authorized Roofing Contractor shall inspect the roof deck and surfaces to receive new materials prior to commencement of the roofing work, and shall notify the Architect in writing of any defects observed. Roofing work shall not proceed until any such defects are corrected. Materials shall not be installed over rough, uneven or improperly prepared surfaces.

B. Commencement of work by Authorized Roofing Contractor shall constitute acceptance of the existing conditions as suitable for the successful completion of the work.

C. It is the intent of this specification that the roofing system be installed as a complete assembly. Installation shall not proceed until all nailers and blocking are in place, all curbs, skylights, smoke vents or similar equipment on the project are ready for installation.

D. Authorized Roofing Contractor shall keep all roof areas free of trash, debris, and excess materials at all times. The General Contractor shall supervise the work of all trades to prevent damage to the completed roofing system and to prevent the accumulation of scraps, metal shavings, fasteners, tools, etc. which could puncture the roof membrane. Accumulation of debris of any type on the Single Ply roofing System shall require removal and replacement of the affected areas, if required by the Owner or owner's representative.

E. Inspect decking before work is commenced for projections, inadequate anchorage, low areas, incorrect slopes, holes or voids, foreign materials and other unacceptable conditions. Correct defects in surfaces prior to commencing work.

F. Examine the areas and conditions under which work in this section will be installed. Correct conditions detrimental to the proper and timely completion of work. Do not proceed until such conditions have been corrected.

3.02 GENERAL INSTALLATION REQUIREMENTS

A. All roof deck surfaces shall be overlaid with gypsum board. No Built-Up Roofing shall be installed directly over wood decking.

B. Coordinate installation so each area is made watertight at the end of each work period.

C. Protect other work from spillage of bituminous roofing materials and prevent liquid materials from entering or clogging drains and conductors. Replace or restore other work damaged by installations of bituminous roofing work.

D. Coordinate with roof accessories, miscellaneous sheet metal accessory items, including piping vents and other devices to be coordinated with the roofing work as specified in other sections to avoid conflict or omission in waterproofing systems and to provide watertight installation.

3.03 WOOD NAILERS (As Required)

A. Treated wood nailers shall be anchored to resist a minimum force of 250 pounds per linear foot in any direction.

B. A 1/2-inch space shall be provided between nailer lengths. Nailer lengths shall not be less than 3 feet long.

C. Thickness shall be as required to match substrate or gypsum height for a smooth, flush condition.

D. All required nailers shall be securely installed prior to roofing.

3.04 INSTALLATION OF GYPSUM BOARD

A. Over the properly prepared roof deck, install Dens-Dek gypsum board in parallel courses per manufacturer's specifications. Stagger the end joints in adjoining courses. Apply Dens-Dek flush to all parapets, curbs or wood nailers. Cut gypsum board neatly to fit around penetrations and projections. Joints in Dens-Dek boards shall be flush with adjoining Dens-Dek boards.

B. All fasteners and stress plates shall be Factory Mutual Approved for mechanical attachment of gypsum board and comply with FM Standard 4470 for corrosion resistance.

C. Fasteners shall be installed in accordance with manufacturer's recommendations, complying with minimum penetration requirements for specific deck types.

D. Fasteners shall be installed using depth-sensing tool attachment to insure proper installation.

3.05 INSTALLATION OF POLYESTER ROOF MEMBRANES

A. Over the gypsum board install two(2) plies of polyester membrane in shingle fashion lapping plies 20 ½ inches. A 20 ½-inch lap will provide an 18 ½-inch exposure. (Note: The 20 ½-inch lap and 18 ½-inch exposure shall be consistent and uniform throughout the roof field.) The plies of polyester membrane shall be set in asphalt bitumen applied at a rate of 30-35 lbs. per 100 square feet per ply. The polyester membranes shall be installed so as to butt against all walls, curbs and vertical surfaces. (Note: No cant strip shall be installed at horizontal to vertical transitions.) A 20 ½-inch

starter strip shall be installed at the low point of the roof deck with the second ply and subsequent plies being full width.

1. All plies of polyester membrane shall be completely mopped with Type III asphalt bitumen, i.e., interply asphalt shall be uniform and complete and in no place shall polyester touch polyester.
2. Subsequent rolls of polyester membrane shall be installed as above; end laps shall be ten(10) inches and staggered.
3. While the bitumen is still hot, a light brooming of the laps may be required to solidly embed the polyester membrane into the asphalt.
4. All plies of polyester shall lay without wrinkles, buckles or kinks.
5. All plies of polyester shall be installed so that the flow of water runs over or parallel to the laps, NEVER AGAINST THE LAPS.

B. At the end of each day's work install water stops to protect the substrate against water penetration.

C. Detach any water stops cleanly at the start of the next day's work.

3.06 INSTALLATION OF FLEECE BACKED THERMOPLACTIC MEMBRANE

A. Installation General Requirements:

1. The FB Roofing Membrane shall be installed by SPR Manufacturer trained and Authorized Roofing Contractor. All SPR Manufacturer's installation instructions and recommendations shall be strictly followed.
2. The methods of installation shall be in strict accordance with these specifications and approved details.
3. It is the intent of the specifications that the design details be followed precisely, being modified only where specifically required to meet field conditions or SPR Manufacturer's warranty requirements.
4. Utilize details approved by SPR Manufacturer for roof to wall junctures and penetrations that are not specifically detailed.
5. Take precautions to ensure that water does not flow beneath any temporary water stops and under any sections of completed roof.
6. At no time shall any portion of the assembly be exposed to moisture. If temporary seals are not installed on a daily basis, Authorized Roofing Contractor may be required to remove and replace any completed roof area, to the deck, for a minimum distance of ten(10) feet from the edge or until dry materials are found, whichever is greater, at no additional cost to the Owner.
7. Membrane must be totally installed in any given day. This includes sealant, flashing and trim. Failure to complete flashing and seam welding on a daily basis will be cause for rejection of the installed roof and will require replacement of the areas involved.

B. Lay-out:

1. Membrane shall be installed in a neat and orderly fashion.
2. Unroll approximately 30 feet of the FB membrane and position the roll over the properly installed BUR base layers. Pull the tail back over the roll to expose a workable area (approximately 30 feet) of substrate. Rolls of the FB Membrane are to be positioned and installed straight and snug but not taut.
3. Adjoining rolls shall overlap the width of the selvage-edge, properly shingled with the flow of water where possible.
4. Subsequent rolls shall "butt" ends with no overlap; butt ends shall be a uniform 1/4-inch apart (maximum.) As feasible, butt ends of adjoining rolls shall be aligned.
5. At all horizontal to vertical transitions, the FB membrane shall be installed so that it tightly butts to the base of the vertical surface but does not turn-up the vertical surface.

C. Attachment:

1. The FB Roof System shall be installed within the field, perimeter and corners of all roof sections into a full mopping of Type III asphalt at the rate of 25lbs. – 30lbs. per 100 square feet.

D. Welding:

1. All field seams exceeding 10 ft. in length shall be welded with an approved automatic welder.
2. All field seams must be clean and dry prior to initiating any field welding.
3. Remove foreign materials from the seams (dirt, oils, etc.) with Acetone, MEK, or authorized alternative. Use CLEAN WHITE COTTON cloths and allow approximately five minutes for

solvents to dissipate before initiating the automatic welder. Do not use denim or synthetic rags for cleaning.

4. All welding shall be performed only by qualified personnel to ensure the quality and continuity of the weld.
5. HAND WELDING: The lap or seam area of the membrane should be intermittently tack welded to hold the membrane in place. The back “interior” edge of the membrane shall be welded first, with a thin, continuous weld to concentrate heat along the exterior edge of the lap during the final welding process. The nozzle of the hand-held hot air welder shall be inserted into the lap at a 45-degree angle to the lap. Once the polymer on the material begins to flow, a hand roller shall be used to apply pressure at a right angle to the tip of the hand welder. Properly welded seams shall utilize a 1-1/2 inch wide nozzle, to create a homogeneous weld, a minimum of 1-1/2 inch width. Smaller nozzles may be used for corners, and other field detailing, maintaining a minimum 1 inch weld.
6. AUTOMATIC MACHINE WELDING: Proper welding of the Thermoplastic Membrane can be achieved with a variety of automatic welding equipment. Properly welded seams shall utilize a 1-1/2 inch wide nozzle, to create a homogeneous weld, a minimum of 1-1/2 inch in width.

E. Flashing
1. All protrusions (pipes, conduits, vents, etc.) to receive field fabricated membrane flashing shall be cleaned to bare metal. All protrusions must be properly secured to the roof deck. Flash all penetrations according to approved details.
2. Flash all curbs, parapets and interior walls in strict accordance with the manufacturers approved vertical flashing details.
3. All flashing shall be fully adhered to properly prepared and approved substrates with bonding adhesive applied per manufacturer’s guidelines and in sufficient quantity to insure total adhesion. All flashing membranes are to be totally bonded. Loose flashing will not be approved.
4. The base flange of any “membrane flashing” shall extend eight (8) inches out on to the plane of the deck from any penetration or wood nailer.
5. Vertical flashing membranes shall be terminated no less than eight (8) inches above the plane of the roof deck with approved termination bar and counter-flashing or metal cap flashing / coping.
6. Complete all inside and outside corner flashing details with pre-formed corners or an approved field fabrication detail.
7. Flashing membranes shall extend to the outside edge of any parapet wall and be secured at the edge with fasteners spaced a maximum of 8 inches on center under metal parapet coping.

F. Inspection and Re-Work of Membrane and Flashing
1. Inspect completed membrane and flashing for punctures, tears and discontinuous welded seams. Probe all seams with a dull pointed probe to insure welds have created a homogeneous bond.
2. Apply additional layer of membrane with rounded corners over punctures and tears, extending a minimum of 3-inches beyond damaged area in all directions.
3. Re-weld seams that were not originally welded, making sure to expose the entire "cold welded" area.
4. Apply additional layer of membrane with rounded corners over contaminated seam areas.

3.07 ROOF DRAINS

A. Flash all roof drains in accordance with manufacturer’s approved details.

B. As required, use tapered insulation around roof drain to provide smooth transition from roof surface to drain clamping ring.

C. As required, non-reinforced .045 mil membrane shall be used for flashing the drain assembly.

3.08 SEALANTS

A. Apply authorized sealant(s) to all surface mounted reglets and where specified per SPR Manufacturer’s instructions and installation guidelines.

B. Use primer when recommended by the manufacturer.

C. Sealants will require periodic maintenance by the building owner's maintenance personnel to prevent their specific exclusion from the warranty.

3.09 SHEET METAL

A. Coordinate flashing and sheet metal with requirements of the related section for complete water-tight weatherproof installation, free of conflict or omission.

B. Coated "Clad Metal:"
   1. All "flanged" perimeter edge details are to be fabricated from Clad Meta as provided by SPR Manufacturer and in accordance with approved details.
   2. Insure all fascia extends a minimum three (3) inches below the bottom of any wood nailer.
   3. Fasten all metal flashing to wood nailers or approved substrate with approved fasteners 8-inches on center, staggered.
   4. Break and install coated metal in accordance with approved details, insuring proper attachment, maintaining 1/2 in. expansion joints and the installation of a minimum 2" bond breaker tape prior to sealing the joint.
   5. Seal metal expansion joints with a 6 inch strip of Single Ply Roofing Single Ply welded to the coated metal.

C. Pitch Pans: Install pitch pans only as last option. Request approved specific design alternatives and recommendations.

3.10 SPECIAL INSTRUCTIONS

A. All rooftop electrical conduits, gas lines or water lines shall be at a sufficient height above the roof surface and placed on hard rubber sleepers fitted with integral unistruts / attachment hardware. No electrical conduit, gas line or water line is permitted to rest directly on the roof surface.

3.11 TEMPORARY SEALING DURING CONSTRUCTION

A. At the end of each working day or at the sign of rain, install temporary, 100% watertight seal(s) where any completed new roofing adjoins the uncovered roof deck.

B. The Authorized Roofing Contractor shall create and maintain the temporary seal in such a manner to prevent water from traveling beneath any newly installed roofing membranes.

C. If water is allowed to enter beneath the newly completed roofing, the affected area(s) shall be removed and replaced at no additional expense to the owner.

3.12 FIELD QUALITY CONTROL

A. Authorized Roofing Contractor Quality Control (QC).
   1. Authorized Roofing Contractor will initiate a QC program to govern all aspects of the installation of the new asphalt attached EIP Membrane Roof System.
   2. The project foreman and or supervisor will be responsible for the daily execution of the QC program which will include, but is not limited to, the supervision, inspection and probing of all heat welding incorporated within the EIP Membrane Roof System.
   3. If inconsistencies in the quality of the welds are found, all work shall cease until corrective actions are taken to insure the continuity of all field and detail welding.

B. SPR Manufacturer's Field Service
   1. Upon completion of installation, provide final inspection by technical service representative of SPR Manufacturer to confirm that roofing system has been installed in accordance with SPR Manufacturer's requirements.

3.13 CLEANING

A. The roofing contractor shall clear the construction areas and shall provide for all necessary removal from the building site of all construction debris associated with the installation of the Roof System.

B. All debris shall be removed from the premises promptly and the construction area left clean daily.

C. Remove bituminous markings from finished surfaces, including roof membrane.

D. In areas where finished surfaces are soiled by bitumen or other source of soiling caused by work of this section, consult manufacturer for cleaning advice and conform to their documented instructions.

E. Repair or replace defaced or damaged finishes caused by work of this section.

3.14 PROTECTION OF FINISHED WORK

A. Protect installed roofing and flashings from construction operations.

B. Where traffic must continue over finished roof membrane, protect surfaces using durable materials.

3.15 FINAL INSPECTION

A. At completion of roofing installation and associated work, meet with Installer, installer of associated work, Owner, roofing system manufacturer's representative and other representatives directly concerned with the performance of the roofing system.

B. Walk roof surface areas of the building, inspect perimeter building edges as well as flashing of roof penetrations, walls, curbs and other equipment. List all items requiring correction or completion and furnish copy of list to each party attending.

C. The Roofing System Manufacturer reserves the right to request a thermographic scan of the roof during final inspection to determine if any damp or wet materials have been installed. The thermographic scan shall be provided by the Roofing Contractor at a negotiated price.

D. If core cuts verify the presence of damp or wet materials, the Roofing Contractor shall be required to replace the damaged areas at his own expense.

E. Repair or replace (as required) deteriorated, damaged or defective work found at time of inspection to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.

F. The Contractor is to notify the owner’s representative upon completion of any required corrections to the newly installed roof system and secure the specified roof warranty from the membrane manufacturer and deliver it to the owner.

END OF SECTION

SECTION 07 6200
SHEET METAL FLASHING AND TRIM

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fabricated sheet metal items, including flashings, counterflashings, downspouts, and coping.

B. Sealants for joints within sheet metal fabrications.

C. Reglets and accessories.

1.02 RELATED REQUIREMENTS

A. Section 07 5300 - Built Up Bituminous Roofing: Roofing system.

B. Section 07 9200 - Joint Sealants: Sealing non-lap joints between sheet metal fabrications and adjacent construction.

C. Section 09 9000 - Painting and Coating: Field painting.

D. Drawings and general provisions of Contract, including Division 1 Specification Sections, apply to this Section.

1.03 REFERENCE STANDARDS

A. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2013.

B. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2014.

C. ASTM D4586/D4586M - Standard Specification for Asphalt Roof Cement, Asbestos-Free; 2007 (Reapproved 2012)e1.

D. SMACNA (ASMM) - Architectural Sheet Metal Manual; Sheet Metal and Air Conditioning Contractors' National Association; 2012.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene one week before starting work of this section.

1.05 SUBMITTALS

A. Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.

1.06 QUALITY ASSURANCE

A. Perform work in accordance with SMACNA 1793 and CDA A4050 requirements and standard details, except as otherwise indicated.

B. Fabricator and Installer Qualifications: Company specializing in sheet metal work with 10 years of documented experience.

PART 2 PRODUCTS

2.01 SHEET MATERIALS

A. Galvanized Steel: ASTM A653/A653M, with G90/Z275 zinc coating; minimum.033 inch (____ mm) thick base metal.

2.02 ACCESSORIES

A. Fasteners: Galvanized steel, with soft neoprene washers.

B. Primer: water base type.

C. Protective Backing Paint: Zinc molybdate alkyd.

D. Sealant to be Concealed in Completed Work: Non-curing butyl sealant.

E. Sealant to be Exposed in Completed Work: ASTM C920; elastomeric sealant, 100 percent silicone with minimum movement capability of plus/minus 25 percent and recommended by manufacturer for substrates to be sealed; clear.

F. Sealant: Polyurethane 07 9005.

G. Plastic Cement: ASTM D4586, Type I.

2.03 FABRICATION

A. Form sections true to shape, accurate in size, square, and free from distortion or defects.

B. Form pieces in longest possible lengths.

C. Hem exposed edges on underside 1/2 inch (13 mm); miter and seam corners.

D. Form material with flat lock seams, except where otherwise indicated. At moving joints, use sealed lapped, bayonet-type or interlocking hooked seams.

E. Fabricate corners from one piece with minimum 18 inch (450 mm) long legs; seam for rigidity, seal with sealant.

2.04 GUTTER AND DOWNSPOUT FABRICATION

A. Downspouts: Round profile 3" schedule 40 iron pipe.

B. Downspout Boots: Cast iron.

C. Seal metal joints.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify roof openings, curbs, pipes, sleeves, ducts, and vents through roof are solidly set, reglets in place, and nailing strips located.

B. Verify roofing termination and base flashings are in place, sealed, and secure.

3.02 PREPARATION

A. Install starter and edge strips, and cleats before starting installation.

B. Back paint concealed metal surfaces with protective backing paint to a minimum dry film thickness of 15 mil (0.4 mm).

3.03 INSTALLATION

A. Conform to drawing details.
   1. SMACNA Architectural Sheet Metal Manual, 2012.

B. Secure flashings in place using concealed fasteners. Use exposed fasteners only where permitted.

C. Apply plastic cement compound between metal flashings and felt flashings.

D. Fit flashings tight in place. Make corners square, surfaces true and straight in planes, and lines accurate to profiles.

E. Secure gutters and downspouts in place using concealed fasteners.

F. Connect downspouts to downspout boots. Grout connection watertight.

3.04 FIELD QUALITY CONTROL

A. Inspection will involve surveillance of work during installation to ascertain compliance with specified requirements.

3.05 SCHEDULE

A. Gutters and Downspouts:

B. Coping, Cap, Parapet, Sill and Ledge Flashings:

C. Counterflashings at Roofing Terminations (over roofing base flashings):

END OF SECTION

SECTION 07 9200
JOINT SEALANTS

PART 1 GENERAL

1.0 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including Division 1 Specification Sections, apply to this section.

1.01 SECTION INCLUDES

A. Nonsag gunnable joint sealants.

B. Joint backings and accessories.

1.02 RELATED REQUIREMENTS

A. Section 07 2500 - Weather Barriers: Sealants required in conjunction with air barriers and vapor retarders.

B. Section 08 8000 - Glazing: Glazing sealants and accessories.

C. Section 09 2116 - Gypsum Board Assemblies: Sealing acoustical and sound-rated walls and ceilings.

D. Section 09 3000 - Tiling: Sealant between tile and plumbing fixtures and at junctions with other materials and changes in plane.

E. Section 23 3000- Air Distribution

1.03 REFERENCE STANDARDS

A. ASTM C834 - Standard Specification for Latex Sealants; 2010.

B. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2014.

C. ASTM C1248 - Standard Test Method for Staining of Porous Substrate by Joint Sealants; 2008 (Reapproved 2012).

1.04 SUBMITTALS

A. Product Data for Sealants: Submit manufacturer's technical data sheets for each product to be used, that includes the following.
   1. Physical characteristics, including movement capability, VOC content, hardness, cure time, and color availability.
   2. List of backing materials approved for use with the specific product.
   3. Substrates that product is known to satisfactorily adhere to and with which it is compatible.
   4. Substrates the product should not be used on.

PART 2 PRODUCTS

2.01 JOINT SEALANT APPLICATIONS

A. Scope:
   1. Exterior Joints: Seal open joints, whether or not the joint is indicated on the drawings, unless specifically indicated not to be sealed. Exterior joints to be sealed include, but are not limited to, the following items.
      a. Wall expansion and control joints.
      b. Joints between door, window, and other frames and adjacent construction.
      c. Joints between different exposed materials.
      d. Openings below ledge angles in masonry.
      e. Other joints indicated below.
   2. Interior Joints: Do not seal interior joints unless specifically indicated to be sealed. Interior joints to be sealed include, but are not limited to, the following items.
      a. Joints between door, window, and other frames and adjacent construction.
      b. Other joints indicated below.
   3. Do not seal the following types of joints.

a. Intentional weepholes in masonry.
b. Joints indicated to be treated with manufactured expansion joint cover or some other type of sealing device.
c. Joints where sealant is specified to be provided by manufacturer of product to be sealed.
d. Joints where installation of sealant is specified in another section.
e. Joints between suspended panel ceilings/grid and walls.

B. Exterior Joints: Use nonsag non-staining silicone sealant, Type 1, unless otherwise indicated.

C. Interior Joints: Use nonsag polyurethane sealant, Type 2, unless otherwise indicated.
1. Wall and Ceiling Joints in Non-Wet Areas: Acrylic emulsion latex sealant; Type 3.

2.02 JOINT SEALANTS - GENERAL

2.03 NONSAG JOINT SEALANTS

A. Type 1 - Non-Staining Silicone Sealant: ASTM C920, Grade NS, Uses M and A; not expected to withstand continuous water immersion or traffic.
1. Movement Capability: Plus and minus 50 percent, minimum.
2. Non-Staining To Porous Stone: Non-staining to light-colored natural stone when tested in accordance with ASTM C1248.
3. Dirt Pick-Up: Reduced dirt pick-up compared to other silicone sealants.

B. Type 2 - Polyurethane Sealant: ASTM C920, Grade NS, Uses M and A; single or multicomponent; not expected to withstand continuous water immersion or traffic.
1. Movement Capability: Plus and minus 25 percent, minimum.

C. Type 3 - Acrylic Emulsion Latex: Water-based; ASTM C834, single component, non-staining, non-bleeding, non-sagging; not intended for exterior use.

2.04 ACCESSORIES

A. Backer Rod: Cylindrical cellular foam rod with surface that sealant will not adhere to, compatible with specific sealant used, and recommended by backing and sealant manufacturers for specific application.

END OF SECTION

SECTION 08 4313
ALUMINUM-FRAMED STOREFRONTS

PART 1 GENERAL

1.01 RELATED REQUIREMENTS

A. Section 07 9200 - Joint Sealants: Sealing joints between frames and adjacent construction.

B. Section 08 8000 - Glazing: Glass and glazing accessories.

C. Section 09 9000 - Painting and Coating: Field painting of interior surface of infill panels.

D. Drawings and general provisions of Contract, including Division 1 Specification Sections, apply to this Section.

1.02 REFERENCE STANDARDS

A. AAMA CW-10 - Care and Handling of Architectural Aluminum from Shop to Site; American Architectural Manufacturers Association; 2012.

B. AAMA 501.2 - Field Check of Metal Storefronts, Curtain Walls, and Sloped Glazing Systems for Water Leakage; American Architectural Manufacturers Association; 2009 (part of AAMA 501).

C. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2013.

D. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes [Metric]; 2013.

1.03 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Conduct a preinstallation meeting one week before starting work of this section; require attendance by all affected installers.

1.04 SUBMITTALS

A. Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, glass and infill and internal drainage details.

B. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related Work, expansion and contraction joint location and details, and field welding required.

C. Manufacturer's Certificate: Certify that the products supplied meet or exceed the specified requirements.

D. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

A. Manufacturer and Installer Qualifications: Company specializing in manufacturing aluminum glazing systems with minimum three years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Handle products of this section in accordance with AAMA CW-10.

B. Protect finished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond to aluminum when exposed to sunlight or weather.

1.07 FIELD CONDITIONS

A. Do not install sealants when ambient temperature is less than 40 degrees F (5 degrees C). Maintain this minimum temperature during and 48 hours after installation.

1.08 WARRANTY

A. Provide warranty jointly signed by manufacturer, installer and Contractor warranting work to be watertight, free from defective materials, defective workmanship, glass breakage due to defective design, and agreeing to replace components which fail within one (1) year from date of

substantial completion.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Aluminum-Framed Storefront:
   1. Kawneer North America; HP-175 Glazed Aluminum Curtainwall: www.kawneer.com.
   2. Oldcastle Building Envelope; HP-175 Glazed Aluminum Curtainwall: www.oldcastlebe.com.

2.02 STOREFRONT

A. Aluminum-Framed Storefront: Factory fabricated, factory finished aluminum framing members with infill, and related flashings, anchorage and attachment devices. Storefront designed for Seismic Design Category D, Wind 110 MPH, Exposure C.
   1. Glazing Rabbet: For 1 inch (25 mm) insulating glazing.
   2. Glazing Position: Centered (front to back).
   3. Vertical Mullion Dimensions: 1-3/4” inches wide by 4-1/2 inches deep.
   4. Finish: Class II natural anodized.
      a. Factory finish all surfaces that will be exposed in completed assemblies.
   5. Finish Color: As selected by Architect from manufacturer's standard line.
   6. Fabrication: Joints and corners flush, hairline, and weatherproof, accurately fitted and secured; prepared to receive anchors and hardware; fasteners and attachments concealed from view; reinforced as required for imposed loads.
   7. Construction: Eliminate noises caused by wind and thermal movement, prevent vibration harmonics, and prevent "stack effect" in internal spaces.
   8. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.
   9. Expansion/Contraction: Provide for expansion and contraction within system components caused by cycling temperature range of 170 degrees F (95 degrees C) over a 12 hour period without causing detrimental effect to system components, anchorages, and other building elements.
   10. Movement: Allow for movement between storefront and adjacent construction, without damage to components or deterioration of seals.
   11. Perimeter Clearance: Minimize space between framing members and adjacent construction while allowing expected movement.
   12. Air and Vapor Seal: Maintain continuous air barrier and vapor retarder throughout assembly, primarily in line with inside pane of glazing and inner sheet of infill panel and heel bead of glazing compound.

2.03 COMPONENTS

A. Aluminum Framing Members: Tubular aluminum sections, thermally broken with interior section insulated from exterior, drainage holes and internal weep drainage system.
   1. Glazing stops: Flush.

B. Glazing: As specified in Section 08 8000.

2.04 MATERIALS

A. Extruded Aluminum: ASTM B221 (ASTM B221M).

B. Fasteners: Stainless steel.

C. Glazing Gaskets: Type to suit application to achieve weather, moisture, and air infiltration requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify dimensions, tolerances, and method of attachment with other work.

B. Verify that wall openings and adjoining air and vapor seal materials are ready to receive work of this section.

3.02 INSTALLATION

A. Install wall system in accordance with manufacturer's instructions.

B. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.

C. Provide alignment attachments and shims to permanently fasten system to building structure.

D. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.

E. Provide thermal isolation where components penetrate or disrupt building insulation.

F. Install sill flashings. Turn up ends and edges; seal to adjacent work to form water tight dam.

G. Where fasteners penetrate sill flashings, make watertight by seating and sealing fastener heads to sill flashing.

H. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.

I. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.

3.03 TOLERANCES

A. Maximum Variation from Plumb: 0.06 inches every 3 ft (1.5 mm/m) non-cumulative or 1/16 inches per 10 ft (1.5 mm/3 m), whichever is less.

B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch (0.8 mm).

3.04 CLEANING

A. Remove protective material from pre-finished aluminum surfaces.

B. Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean.

END OF SECTION

SECTION 08 7100

DOOR HARDWARE

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. This Section includes items known commercially as finish or door hardware that are required for swing, sliding, and folding doors, except special types of unique hardware specified in the same sections as the doors and door frames on which they are installed.

B. This Section includes the following, but is not necessarily limited to:

1. Door Hardware.
2. Storefront and Entrance door hardware.
3. Thresholds, gasketing and weather-stripping.

C. Related Sections: The following sections are noted as containing requirements that relate to this Section, but may not be limited to this listing

1. Section 08-4313 - Aluminum Storefronts

1.03 REFERENCES

A. 2013 California Building Code, CCR, Title 24.

B. BHMA – Builders' Hardware Manufacturers Association

C. CCR – California Code of Regulations, Title 24, Part 2, California State Accessibility Standards.

D. DHI – Door and Hardware Institute

E. NFPA - National Fire Protection Association.

1. NFPA 80 - Fire Doors and Other Opening Protectives
2. NFPA 105 - Smoke and Draft Control Door Assemblies

F. UL - Underwriters Laboratories.

1. UL 10C - Fire Tests of Door Assemblies
2. UL 305 - Panic Hardware

G. WHI - Warnock Hersey Incorporated

H. SDI - Steel Door Institute

1.04 SUBMITTALS & SUBSTITUTIONS

A. See Section 01-3300 – Submittals, for submittal procedures.

B. Submit product data (catalog cuts) including manufacturers' technical product information for each item of door hardware, installation instructions, maintenance of operating parts and finish, and other information necessary to show compliance with requirements.

C. Submit six (6) copies of schedule organized vertically 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. Include a Cover Sheet with;
   a. Job Name, location, telephone number.
   b. Architects name, location and telephone number.
   c. Contractors name, location, telephone number and job number.
   d. Suppliers name, location, telephone number and job number.
   e. Hardware consultant's name, location and telephone number.

2. Job Index information included;
   a. Numerical door number index including; door number, hardware heading number and page number.
   b. Complete keying information (referred to DHI hand-book "Keying Systems and Nomenclature"). Provision should be made in the schedule to provide keying information when available; if it is not available at the time the preliminary schedule is submitted.
   c. Manufacturers' names and abbreviations for all materials.
   d. Explanation of abbreviations, symbols, and codes used in the schedule.
   e. Mounting locations for hardware.
   f. Clarification statements or questions.
   g. Catalog cuts and manufacturer’s technical data and instructions.

3. Vertical schedule format sample:

Heading Number 1 (Hardware group or set number – HW -1)						
			(a) 1 Single Door #1 - Exterior from Corridor 101		(b) 90°	(c) RH
			(d) 3' 0"x7' 0" x 1-3/4" x (e) 20 Minute (f) WD x HM			
(g) 1	(h)	(i) ea	(j) Hinges - (k) 5BB1HW 4.5 x 4.5 NRP (l) ½ TMS		(m) 626	(n) IVE
2	6AA	1 ea	Lockset - ND50PD x RHO x RH x 10-025 x JTMS		626	SCH

(a) - Single or pair with opening number and location. (b) - Degree of opening (c) - Hand of door(s) (d) - Door and frame dimensions and door thickness. (e) - Label requirements if any. (f) - Door by frame material. (g) - (Optional) Hardware item line #. (h) - Keyset Symbol. (i) - Quantity. (j) - Product description. (k) - Product Number. (l) - Fastenings and other pertinent information. (m) - Hardware finish codes per ANSI A156.18. (n) - Manufacture abbreviation.

D. Make substitution requests in accordance with Section 01-6000 – Product Requirements. Substitution requests must be made prior to bid date. Include product data and indicate benefit to the project. Furnish samples of any proposed substitution.

E. Keying Schedule: Submit separate detailed schedule indicating clearly how the Owner's final instructions on keying of locks has been fulfilled.

F. Templates for doors, frames, and other work specified to be factory prepared for the installation of door hardware. Check shop drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.

G. Furnish as-built/as-installed schedule with close-out documents, including keying schedule and transcript, wiring/riser diagrams, manufacturers' installation and adjustment and maintenance information.

H. Fire Door Assembly Testing: Submit a written record of each fire door assembly to the Owner to be made available to the Authority Having Jurisdiction (AHJ) for future building inspections.

1.05 QUALITY ASSURANCE

A. Obtain each type of hardware (latch and lock sets, hinges, closers, exit devices, etc.) from a single manufacturer.

B. Supplier Qualifications: A recognized architectural door hardware supplier, with warehousing facilities in the project's vicinity, that has a record of successful in-service performance for supplying door hardware similar in quantity, type, and quality to that indicated for this project and that employs an experienced architectural hardware consultant (AHC) who is available to Owner, Architect, and Contractor, at reasonable times during the course of the Work, for consultation.

1. Responsible for detailing, scheduling and ordering of finish hardware.
2. Meet with Owner to finalize keying requirements and to obtain final instructions in writing. To maintain the integrity of patented key systems provide a letter of authorization from the specified manufacturer indicating that supplier has authorization to purchase the key system directly from the manufacturer.
3. Stock parts for products supplied and are capable of repairing and replacing hardware items found defective within warranty periods.

C. Hardware Installer: Company specializing in the installation of commercial door hardware with five years documented experience.

D. Fire-Rated Openings: Provide door hardware for fire-rated openings that complies with NFPA Standard No. 80 and requirements of authorities having jurisdiction. Provide only items of door hardware that are listed and tested by UL or Warnock Hersey for given type/size opening and degree of label. Provide proper latching hardware, door closers, approved-bearing hinges and seals whether listed in the Hardware Schedule or not.

1. Where emergency exit devices are required on fire-rated doors, (with supplementary marking on doors' UL labels indicating "Fire Door to be Equipped with Fire Exit Hardware") provide UL label on exit devices indicating "Fire Exit Hardware".

E. Exit Doors: Operable from inside with single motion without the use of a key or special knowledge or effort, and shall not require tight gripping, tight pinching or twisting of the wrist to operate.

1.06 DELIVERY, STORAGE AND HANDLING

A. Coordinate delivery of packaged hardware items to the appropriate locations (shop or field) for installation.

B. Hardware items shall be individually packaged in manufacturers' original containers, complete with proper fasteners. Clearly mark packages on outside to indicate contents and locations in hardware schedule and in work.

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

D. Inventory door hardware jointly with representatives of hardware supplier and hardware installer until each is satisfied that count is correct.

1.07 WARRANTY

A. Provide warranties of respective manufacturers' regular terms of sale from day of final acceptance as follows:

1. Locksets: "L" Series (3) years – "ND" Ten (10) years.
2. Closers: Thirty (30) years –1260 twenty (20) years –Concealed High Security fifteen (15) years --except electronic closers shall be two (2) years.
3. Exit devices: Three (3) years.
4. All other hardware: Two (2) years.

1.08 MAINTENANCE

A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

1.09 PRE-INSTALLATION CONFERENCE

A. Convene a pre-installation conference at least one week prior to beginning work of this section.

B. Attendance: Architect, Construction Manager, Contractor, Security Contractor, Hardware Supplier, Installer, and Key City Personnel.

C. Agenda: Review hardware schedule, products, installation procedures and coordination required with related work. Review District's keying standards.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

Item	Manufacturer	Acceptable Substitute
A. Locks, Latches & Cylinders	Schlage	
B. Push, Pulls & Protection Plates	Rockwood	Trimco, BBW, DCI

2.02 MATERIALS

A. Heavy Duty Cylindrical Locks and Latches: Schlage "ND" Series as scheduled with "Sparta" design, fastened with through-bolts and threaded chassis hubs.

1. Locksets to comply with ANSI A156.2, Series 4000, Grade 1; tested to exceed 3,000,000 cycles. Locksets shall meet ANSI A117.1, Accessible Code.
2. Chassis: One piece modular assembly and multi-functional allowing function interchange without disassembly of lockset.
3. Spindle shall be deep-draw manufactured not stamped. Spindle and spring cage to be one-piece integrated assembly.
4. Anti-rotation plate to be interlocking to the lock chassis. Lock design utilizing bit-tabs are not acceptable.
5. Lever Trim: Accessible design, bi-directional, independent assemblies.
6. Locks shall be of such construction that when locked, the door may be opened from within by using lever and without the use of a key or special knowledge.
7. Thru-bolts to secure anti-rotation plate without sheer line. Fully threaded thru-bolts are not acceptable.
8. Spring cage to have double compression springs. Manufacturers utilizing torsion springs are not acceptable.
9. Latchbolt to be steel with minimum ½” throw deadlatch on keyed and exterior functions; ¾” throw anti-friction latchbolt on pairs of doors.
10. Strikes: ANSI curved lip,1-1/4” x 4-7/8”, with 1” deep dust box (K510-066). Lips shall be of sufficient length to clear trim and protect clothing.

B. Protection Plates: Fabricate either kick, armor, or mop plates with four beveled edges. Provide kick plates 10" high and 2" LDW. Sizes of armor and mop plates shall be listed in the Hardware Schedule. Furnish with machine or wood screws of bronze or stainless to match other hardware.

2.03 KEYING

A. Furnish a Proprietary Schlage masterkey system as directed by the owner or architect. Key system to be designated and combinated by the Schlage Master Key Department even if pinned by the Authorized Key Center, Authorized Security Center or a local authorized commercial dealer.

B. A detailed keying schedule is to be prepared by the owner and/or architect in consultation with a representative of Allegion. **The Supplier for this project is to contact Mark Betschart, with Allegion (Phone 925-640-9081) for a keying meeting**.

C. Furnish all cylinders in the Schlage Full Size Interchangable Core (FSIC). Pack change keys independently (PKI)

D. Furnish construction keying for doors requiring locking during construction.

2.04 FINISHES

A. Generally to be satin chrome US26D (626 on bronze and 652 on steel) unless otherwise noted.

B. Furnish push plates, pull plates and kick or armor plates in satin stainless steel US32D (630) unless otherwise noted.

C. Door closers shall be powder-coated to match other hardware, unless otherwise noted.

D. Aluminum items to be finished anodized aluminum except thresholds which can be furnished as standard mill finish.

2.05 FASTENERS

A. Screws for strikes, face plates and similar items shall be flat head, countersunk type, provide machine screws for metal and standard wood screws for wood.

B. Screws for butt hinges shall be flathead, countersunk, full-thread type.

C. Fastening of closer bases or closer shoes to doors shall be by means of sex bolts and spray painted to match closer finish.

D. Provide expansion anchors for attaching hardware items to concrete or masonry.

E. All exposed fasteners shall have a phillips head.

F. Finish of exposed screws to match surface finish of hardware or other adjacent work.

G. All Exit Devices and Lock Protectors shall be fastened to the door by the means of sex bolts or through bolts.

PART 3 - EXECUTION

3.01 INSPECTION

A. Verify that doors and frames are square and plumb and ready to receive work and dimensions are as instructed by the manufacturer.

B. Beginning of installation means acceptance of existing conditions.

C. Fire-Rated Door Assembly Inspection: Upon completion of the installation, all fire door assemblies shall be inspected to confirm proper operation of the closing device and latching device and that only the manufacturer's furnished fasteners are used for installation and that it meets all criteria of a fire door assembly per NFPA 80 (Standard for Fire Doors and Other Opening Protectives) 2013 Edition. A written record shall be maintained and transmitted to the Owner to be made available to the Authority Having Jurisdiction (AHJ). The inspection of the swinging fire doors shall be performed by a certified FDAI (Fire Door Assembly Inspector) with knowledge and understanding of the operating components of the type of door being subjected to the inspection. The record shall list each fire door assembly throughout the

project and include each door number, an itemized list of hardware set components at each door opening, and each door location in the facility.

3.02 INSTALLATION

A. Install hardware in accordance with manufacturer's instructions and requirements of DHI.

B. Use the templates provided by hardware item manufacturer.

C. Mounting heights for hardware shall be as recommended by the Door and Hardware Institute. Operating hardware will to be located between 38" and 44" AFF.

D. Set units level, plumb and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.

E. Drill and countersink units that are not factory-prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry standards.

F. Set thresholds for exterior doors in full bed of butyl-rubber sealant.

G. If hand of door is changed during construction, make necessary changes in hardware at no additional cost.

H. Hardware Installer shall coordinate with security contractor to route cable to connect electrified locks, panic hardware and fire exit hardware to power transfers or electric hinges at the time these items are installed so as to avoid disassembly and reinstallation of hardware.

I. Hardware Installer shall also be present with the security contractor when the power is turned on for the testing of the electronic hardware applications. Installer shall make adjustments to solenoids, latches, vertical rods and closers to insure proper and secure operation.

J. All wiring for electro-mechanical hardware mounted on the door shall be connected through the power transfer and terminated in the interface junction box specified for in the Electrical Section.

K. Conductors shall be minimum 18 gage stranded, multicolored. A minimum 12 in. loop of conductors shall be coiled in the interface junction box. Each conductor shall be permanently marked with its function.

L. If a power supply is specified in the hardware sets, all conductors shall be terminated in the power supply. Make all connections required for proper operation between the power supply and the electro-mechanical hardware. Provide the proper size conductors as specified in the manufacturer’s technical documentation.

3.03 ADJUST AND CLEAN

A. Adjust and check each operating item of hardware and each door, to ensure proper operation or function of every unit. Replace units which cannot be adjusted to operate freely and smoothly as intended for the application made.

B. Clean adjacent surface soiled by hardware installation.

C. Final Adjustment: Wherever hardware installation is made more than one month prior to acceptance or occupancy, return to that work area and make final check and adjustment of all hardware items in such space or area. Clean operating items as necessary to restore

proper function and finish of hardware and doors. Adjust door control devices to compensate for final operation of heating and ventilating equipment.

D. Instruct Owner's Personnel in proper adjustment and maintenance of hardware finishes, during the final adjustment of hardware.

E. Continued Maintenance Service: Approximately six months after the completion of the project, the Contractor accompanied by the Architectural Hardware Consultant, shall return to the project and re-adjust every item of hardware to restore proper functions of doors and hardware. Consult with and instruct Owner's personnel in recommended additions to the maintenance procedures. Replace hardware items which have deteriorated or failed due to faulty design, materials or installation of hardware units. Prepare a written report of current and predictable problems (of substantial nature) in the performance of the hardware.

3.04 HARDWARE LOCATIONS

A. Conform to CCR, Title 24, Part 2; and ADAAG; and the drawings for access-compliant positioning requirements for the disabled.

3.05 FIELD QUALITY CONTROL

A. Hardware supplier is responsible for providing the services of an Architectural Hardware Consultant (AHC) or a proprietary product technician to inspect installation and certify that hardware and its installation have been furnished and installed in accordance with manufacturers' instructions and as specified herein.

3.06 SCHEDULE

A. The items listed in the following schedule shall conform to the requirements of the foregoing specifications.

B. The Door Schedule on the Drawings indicates which hardware set is used with each door.

Manufacturers Abbreviations (Mfr.)

ADA	=	Adams Rite Mfg.	Aluminum Door Hardware
GLY	=	Glynn-Johnson Corporation	Overhead Door Stops
IVE	=	Ives	Hinges, Pivots, Bolts, Coordinators, Dust Proof Strikes
LCN	=	LCN	Door Closers
ZER	=	Zero	Thresholds, Gasketing & Weather-stripping
PEM	=	Pemko	Thresholds, Gasketing & Weather-stripping
SCH	=	Schlage Lock Company	Locks, Latches & Cylinders
VON	=	Von Duprin	Exit Devices
ROC	=	Rockwood	Push Pull and Kick Plates

HARDWARE GROUP NO. 01 – EXTERIOR EXISTING STOREFRONT DOOR

FOR USE ON MARK/DOOR #: 1

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	METAL DOOR PLATE	K1125DIA	6AL	ROC

HARDWARE GROUP NO. 02 - INTERIOR EXISTING OFFICE DOOR

FOR USE ON MARK/DOOR #: 2
EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	ENTRANCE/OFFICE LOCK	ND50PD TLR	626	SCH

HARDWARE GROUP NO. 03 – INTERIOR EXISTING DOOR

FOR USE ON MARK/DOOR #: 3
EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	STRAIGHT PULL	RM 3340	STAIN LESS	ROC

END OF SECTION

SECTION 08 8000
GLAZING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Glass.

B. Glazing compounds and accessories.

1.02 RELATED REQUIREMENTS

A. Section 08 4313 - Aluminum-Framed Storefronts: Glazing furnished by storefront manufacturer.

B. Drawings and general provisions of Contract, including Division 1 Specification Sections, apply to this Section.

1.03 REFERENCE STANDARDS

A. ASTM C1036 - Standard Specification for Flat Glass; 2011e1.

B. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2012.

C. ASTM E1300 - Standard Practice for Determining Load Resistance of Glass in Buildings; 2012a.

D. ASTM E2190 - Standard Specification for Insulating Glass Unit Performance and Evaluation; 2010.

E. GANA (GM) - GANA Glazing Manual; Glass Association of North America; 2009.

F. GANA (SM) - GANA Sealant Manual; Glass Association of North America; 2008.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by all affected installers.

1.05 SUBMITTALS

A. Product Data on Glass Types: Provide structural, physical and environmental characteristics, size limitations, special handling or installation requirements.

B. Product Data on Glazing Compounds: Provide chemical, functional, and environmental characteristics, limitations, special application requirements. Identify available colors.

1.06 QUALITY ASSURANCE

A. Perform Work in accordance with GANA Glazing Manual and GANA Sealant Manual for glazing installation methods.

1.07 FIELD CONDITIONS

A. Do not install glazing when ambient temperature is less than 50 degrees F (10 degrees C).

PART 2 PRODUCTS

2.01 GLASS UNITS

A. Type IG-1 - Glass Units: Vision glass, single glazed.
   1. Application: All exterior glazing unless otherwise indicated.
   2. Annealed float glass, 1/4 inch thick, minimum.
      a. Tint: Bronze to match existing.
   3. Total Thickness: 1/4 inch (25 mm).
   4. Fully tempered at locations as required by building code.

2.02 EXTERIOR GLAZING ASSEMBLIES

A. Performance Criteria: Select type and thickness of glass to withstand dead and live loads caused by positive and negative wind pressure acting normal to plane of glass.

1. Use the procedure specified in ASTM E1300 to determine glass type and thickness.
2. Limit glass deflection to 1/200 or flexure limit of glass, whichever is less, with full recovery of glazing materials.
3. Glass thicknesses listed are minimum.

2.03 GLASS MATERIALS

A. Float Glass: All glazing is to be float glass unless otherwise indicated.
   1. Annealed Type: ASTM C1036, Type I, transparent flat, Class 1 clear, Quality Q3 (glazing select).
   2. Heat-Strengthened and Fully Tempered Types: ASTM C1048.
   3. Thicknesses: As indicated; for exterior glazing comply with specified requirements for wind load design regardless of specified thickness.

2.05 GLAZING COMPOUNDS

A. Type as recommended by manufacturer.

2.06 GLAZING ACCESSORIES

A. Setting Blocks: Neoprene, 80 to 90 Shore A durometer hardness; ASTM C864 Option II. Length of 0.1 inch for each square foot (25 mm for each square meter) of glazing or minimum 4 inch (100 mm) x width of glazing rabbet space minus 1/16 inch (1.5 mm) x height to suit glazing method and pane weight and area.

B. Glazing Gaskets: Resilient silicone extruded shape to suit glazing channel retaining slot; ASTM C864 Option II; black color.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that openings for glazing are correctly sized and within tolerance.

B. Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and ready to receive glazing.

3.02 PREPARATION

A. Clean contact surfaces with solvent and wipe dry.

B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.

C. Prime surfaces scheduled to receive sealant.

3.03 INSTALLATION - EXTERIOR/INTERIOR DRY METHOD (GASKET GLAZING)

A. Place setting blocks at 1/4 points with edge block no more than 6 inch (152 mm) from corners.
B. Rest glazing on setting blocks and push against fixed stop with sufficient pressure on gasket to attain full contact.
C. Install removable stops without displacing glazing gasket; exert pressure for full continuous contact.

3.04 FIELD QUALITY CONTROL

A. Glass and Glazing product manufacturers to provide field surveillance of the installation of their products.

B. Monitor and report installation procedures and unacceptable conditions.

3.05 CLEANING

A. Remove glazing materials from finish surfaces.
B. Remove labels after Work is complete.
C. Clean glass and adjacent surfaces.

3.06 PROTECTION

A. After installation, mark pane with an 'X' by using removable plastic tape or paste; do not mark heat absorbing or reflective glass units.

END OF SECTION

SECTION 09 2116
GYPSUM BOARD ASSEMBLIES

PART 1 GENERAL

1.00 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including Division 1 Specification Sections, apply to this Section.

1.01 SECTION INCLUDES

A. Performance criteria for gypsum board assemblies.

B. Metal stud wall framing.

C. Cementitious backing board.

D. Gypsum wallboard.

E. Joint treatment and accessories.

F. Textured finish system.

1.02 REFERENCE STANDARDS

A. ANSI A108.11 - American National Standard for Interior Installation of Cementitious Backer Units; 2013.1.

B. ASTM C475/C475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board; 2012.

C. ASTM C645 - Standard Specification for Nonstructural Steel Framing Members; 2014.

D. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2011.

E. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board; 2013.

F. ASTM C954 - Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs From 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness; 2011.

G. ASTM C1002 - Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs; 2014.

H. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2014.

I. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2012.

J. GA-216 - Application and Finishing of Gypsum Board; Gypsum Association; 2013.

1.03 SUBMITTALS

A. Product Data: Provide data on metal framing, gypsum board, accessories, and joint finishing system.

B. Product Data: Provide manufacturer's data on partition head to structure connectors, showing compliance with requirements.

PART 2 PRODUCTS

2.01 GYPSUM BOARD ASSEMBLIES

A. Provide completed assemblies complying with ASTM C840 and GA-216.
   1. See PART 3 for finishing requirements.

2.02 METAL FRAMING MATERIALS

A. Manufacturers - Metal Framing, Connectors, and Accessories:
   1. Clarkwestern Dietrich Building Systems LLC; www.clarkdietrich.com.

B. Non-Loadbearing Framing System Components: ASTM C645; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 for the spacing indicated, with maximum deflection of wall framing of L/240 at 5 psf (240 Pa).
   1. Studs: "C" shaped with flat or formed webs with knurled faces.
   2. Runners: U shaped, sized to match studs.

2.03 BOARD MATERIALS

A. Manufacturers - Gypsum-Based Board:
   1. Georgia-Pacific Gypsum: www.gpgypsum.com.
   2. National Gypsum Company; www.nationalgypsum.com.

B. Gypsum Wallboard: Paper-faced gypsum panels as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
   1. Application: Use for vertical surfaces and ceilings, unless otherwise indicated.
   2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
   3. Thickness:
      a. Vertical Surfaces: 5/8 inch (16 mm).
   4. Mold-Resistant Paper-Faced Products:
      a. Georgia-Pacific Gypsum; ToughRock Mold-Guard.
      b. National Gypsum Company; Gold Bond XP Gypsum Board.

C. Backing Board For Wet Areas: One of the following products: National Perma Base Cement Board.
   1. Application: Surfaces behind tile in wet areas including tub and shower surrounds, shower ceilings.

D. For exterior application: Georgia Pacific Dens-Glass Sheathing, or equal.

2.04 ACCESSORIES

A. Joint Materials: ASTM C475 and as recommended by gypsum board manufacturer for project conditions.

B. Textured Finish Materials: Latex-based compound; plain.

C. Screws for Attachment to Steel Members Less Than 0.033 inch (0.84 mm) In Thickness, to Wood Members, and to Gypsum Board: ASTM C1002; self-piercing tapping type; cadmium plated for exterior locations.

D. Screws for Attachment to Steel Members From 0.033 to 0.112 inch (0.84 to 2.84 mm) in Thickness: ASTM C954; steel drill screws for application of gypsum board to loadbearing steel studs.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that project conditions are appropriate for work of this section to commence.

3.02 FRAMING INSTALLATION

A. Metal Framing: Install in accordance with ASTM C754 and manufacturer's instructions.

B. Studs: Space studs at 24 inches on center (at 600 mm on center).
   1. Extend partition framing to structure where indicated and to ceiling in other locations.
   2. Partitions Terminating at Ceiling: Attach ceiling runner securely to ceiling track in accordance with manufacturer's instructions.

3.03 BOARD INSTALLATION

A. Comply with ASTM C 840, GA-216, and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.

B. Cementitious Backing Board: Install over steel framing members and plywood substrate where indicated, in accordance with ANSI A108.11 and manufacturer's instructions.

3.04 JOINT TREATMENT

A. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:
   1. Level 4: Walls and ceilings to receive paint finish or wall coverings, unless otherwise indicated.
   2. Level 1: Fire rated wall areas above finished ceilings, whether or not accessible in the completed construction.

B. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
   1. Feather coats of joint compound so that camber is maximum 1/32 inch (0.8 mm).

3.05 TEXTURE FINISH

A. Apply finish texture coating by means of spraying apparatus in accordance with manufacturer's instructions and to match approved sample.

END OF SECTION

SECTION 09 2400
PORTLAND CEMENT PLASTERING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Portland cement plaster for installation over metal lath.
   1. Over framed substrates.

1.02 RELATED REQUIREMENTS

A. Section 06-1000 - Rough Carpentry: Wood stud framing for plaster.

B. Section 07-6200 - Sheet Metal Flashing and Trim.

C. Section 07-9005 - Joint Sealers.

D. Pertinent sections of other divisions specifying items mounted on, or openings or penetrations in plaster surfaces.

E. Drawings and general provisions of Contract, including Division 1 Specifications, apply to this section.

1.03 REFERENCE STANDARDS

A. ASTM C150 - Standard Specification for Portland Cement.

B. ASTM C206 - Standard Specification for Finishing Hydrated Lime.

C. ASTM C926 - Standard Specification for Application of Portland Cement-Based Plaster.

D. ASTM C932 - Standard Specification for Surface-Applied Bonding Compounds for Exterior Plastering.

E. ASTM C 1032 - Standard Specification for Woven Wire Plaster Base; 2006.

F. ASTM C 1063 - Standard Specification for Installation of Lathing and Furring to Receive Interior and Exterior Portland Cement-Based Plaster.

G. ASTM C 1116 - Standard Specification for Fiber-Reinforced Concrete and Shotcrete.

H. ASTM E 331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2009.

I. ASTM F 1667 - Standard Specification for Driven Fasteners: Nails, Spikes, and Staples;.

J. California Code of Regulations, Title 24 Part 2, "California Building Code", 2007 edition; International Building Code, IBC 2006 edition with California amendments. Chapter 25.

K. ICC-ES Acceptance Criteria for Water-Resistive Barriers AC38.

L. ITS (DIR) - Directory of Listed Products; Intertek Testing Services NA, Inc..

M. PCA EB049 - Portland Cement Plaster/Stucco Manual; Portland Cement Association.

N. UL (FRD) - Fire Resistance Directory; Underwriters Laboratories Inc..

O. Manufacturer's specifications and recommendations.

P. Plaster and Drywall Systems Manual published by BNI Books and distributed by the Lathing and Plastering Institute of Northern California; which includes referenced ASTM standards.

1.04 SYSTEM DESCRIPTION

A. Design Requirements:
   1. Extend complete plaster assembly behind surface installed fixtures and trim.
   2. Two layers of building paper beneath lath at all locations.

B. Performance Requirements:
   1. Finish surfaces flat, true, and plumb to plus or minus 1/8-inch in 10 feet.
   2. Provide weathertight assembly.

1.05 SUBMITTALS

A. See Section 01-3300 - Submittals for submittal procedures.

B. Product Data: Provide data on plaster materials, characteristics and limitations of lath, fasteners and other products specified. Include mix design for each coat.

C. Samples: Submit two samples, 12 x 12 inch in size illustrating finish color and texture. Provide color samples of sealants. Provide physical samples of each type of fastener and anchorage.

1.06 QUALITY ASSURANCE

A. Perform Work in accordance with PCA Portland Cement Plaster (Stucco) Manual.
   1. Maintain one copy on site.

B. Regulatory requirements: All plaster work shall be performed in accordance with requirements of California Building Code, Chapter 25, Section 2510 and 2512.

C. Conform to California Building code for fire rated assemblies as indicated on drawings.
   1. Coordinate components of fire rated assemblies with materials specified for support of plaster in other sections.

1.07 MOCK-UP

A. Construct mock-up of exterior wall, 8 feet long by 8 feet wide, illustrating surface finish.

B. Locate where directed.

C. Mock-up may remain as part of the Work.

1.08 FIELD CONDITIONS

A. Do not apply plaster when substrate or ambient air temperature is under 50 degrees F or over 80 degrees F.

B. Maintain minimum ambient temperature of 50 degrees F during installation of plaster and until cured.

PART 2 PRODUCTS

2.01 PLASTER MATERIALS

A. Portland Cement, Aggregates, and Other Materials: In accordance with ASTM C926.

B. Premixed Plaster for Stucco Scratch, Brown, and Finish Coats: Complying with material requirements of ASTM C926.
   1. Products:

C. Premixed Finish Coat: La Habra or equal, type required to achieve specified finish texture, with integral colorant as selected by Architect from full range of manufacturer's standards, to approximate selected paint finish color.

D. Portland Cement: ASTM C150, Type I.

E. Lime: ASTM C206, Type S.

F. Aggregate: In accordance with ASTM C 926.

G. Water: Clean, fresh, potable and free of mineral or organic matter that could adversely affect plaster.

H. Admixture: base coat type; "PRF" manufactured by Gibco, Tulsa OK.

I. Fiber mesh reinforcement: Propex Concrete Systems, www.fibermesh.com, "Fibercast 500®"; 100% virgin polypropylene, fibers containing no reprocessed olefin materials and specifically manufactured for use as cementitious micro-reinforcement; ASTM C 1116, Type III 4.1.3, performance level 1. and ACI 524R-93.

J. Color Pigment: Mineral oxide type, selected color from full range of available colors, including "premiums" to approximate selected paint finish.

K. Bonding Agent: ASTM C932; type recommended for bonding plaster to concrete surfaces.

2.02 METAL LATH

A. Water-Resistive Barrier: 15 lb. Asphalt impregnated building paper, Federal Specification UU-B790a, Type 1, Grade D, Style 2, UBC Standard 14-1, average water resistance > 60 minutes.
   1. Salinas Valley Asphalt Saturated Kraft "RATAN";
   2. Fortifiber Corporation, Atteboro, MA, “Super Jumbo Tex”.
   3. Substitutions: See Section 01600 - Product Requirements.

B. Flexible Flashing: Waterproofing Barrier beneath exposed horizontal exterior portland cement covered surfaces. ASTM D 1970 and the following:
   1. Minimum 25 mil (0.64 mm), cold applied, self-adhering membrane consisting of a 3 mil (0.07 mm) high density, cross-laminated polyethylene film coated on one side with a 22 mil (0.56 mm) layer of rubberized asphalt adhesive. Rolls interwound with a disposable silicone coated release sheet.
   2. Product "Vycor Plus" as manufactured by Grace, www.na.graceconstruction.com.
   3. Substitutions: See Section 01600 - Product Requirements.

C. Lath:
   1. Sheathed metal stud walls: Woven wire lath conforming to ASTM C 1032, 1-1/2 inch opening, 17 gauge, with stiffener wire, paper-backed or un-backed. If unbacked lath is provided, it must be installed over two continuous layers of building paper as required by code.
   2. Framed soffits: Expanded metal lath, 3.4 pound, expanded, galvanized 3/8-inch rib

D. Furring Fasteners - Wood Stud Framing: Attach woven wire metal lath on sheathed wood stud walls using self furring fastener system.
   1. Nails: ASTM F 1667, minimum shank diameter 0.1205 inches, head diameter 7/16 inch, 1-3/4 inches long, Class 1 Galvanized per ASTM A641.
   2. Furring Seal Fastener System: Consisting of Base unit of high-density polyethylene with cap and plunger, sealant load and a nail, as described in the above paragraph. The sealant is forced out of the base unit by the plunger when impacted by the nail. Base unit shall provided minimum 1/4 inch furring. Sealant shall be rubber-butyl-rubber based compound.
   3. Cardboard furring wads are not acceptable.
   4. Water Penetration: ASTM E331 - Pass.
   5. Ultra-Violet Light Resistance: Comply with Section 4.1.2 of ICC-ES Acceptance criteria for Water-Resistive barriers (AC38).
   6. FastenSeal Furring Fastener System by Fasten Seal Products LLC, www.fastenseal.com, ICC-ES ESR-1675.
   7. Substitutions: See Section 01600 - Product Requirements.

E. Anchorage: Screws, staples, or other metal supports conforming to requirements of referenced standards, of type and size to suit application and conforming to requirements of ASTM C1063 for conditions indicated, galvanized, to rigidly secure lath and associated metal accessories in place.

2.03 ACCESSORIES

A. General: Galvanized steel, unless otherwise specified.

B. Reinforcement:
   1. Interior Corners: No. 30
   2. Exterior Corners: Plaster and Drywall Systems Manual Detail 15-B.

C. Screeds and Molds: Per Plaster and Drywall Systems Manual, size and profile as indicated on the Drawings and as necessary to suit application.
   1. 22 gauge galvanized steel. Hem exposed edges. Furnish in longest possible lengths.
   2. Furnish drip screeds with weep holes every 2-inches.

D. Expansion and Control Joints:
   1. Vertical Joints:

a. Control Joints: Keene #C-J Series. Size as noted on Drawings.
b. Expansion Joints: No. 40; Size as noted on Drawings.

2. Horizontal Control Joints: No. 15; Size as noted on Drawings.
3. Diagonal Joints: Type as noted on Drawings.

E. Sealant: Types specified in Section 07-9005.

2.04 PLASTER MIXES

A. Over Metal Lath: Three-coat application, mixed and proportioned in accordance with ASTM C926.

B. Mix only as much plaster as can be used prior to initial set.

C. Add color pigments to finish coat in accordance with manufacturer's instructions.

D. Mix materials dry, to uniform color and consistency, before adding water. Use minimum amount of water that will produce a workable consistency.

E. Protect mixtures from freezing, frost, contamination, and excessive evaporation.

F. Do not retemper mixes after initial set has occurred.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify the suitability of existing conditions before starting work.

B. Mechanical and Electrical: Verify services within walls have been tested and accepted.

3.02 WATER-RESISTIVE BARRIER AND FLASHINGS

A. Install in accordance with referenced standards. Fasten securely in place.

B. Water-Resistive Barrier and Flashings:
1. Cover surfaces of framing under exterior plaster with 2 layers of water-resistive barrier, without holes, tears, or gaps. Apply bottom layer of water-resistive barrier as a separate layer. Secure end laps at supports.
2. Install water-resistive barrier continuously behind applied accessories.
3. Lap horizontal edges 4 inches minimum, shingle fashion to weather.
4. Lap vertical edges 6 inches minimum and seal with tape.
5. Double bottom layer at corners, extending 6 inches around corner from each side.
6. Lap sheet metal flashings. Lap water-resistive barrier flashing strips at door frames and windows; lap over head and jamb strips and under sill strip.
7. Extend no part of metal lath under paper or flashing. Weather all laps to exterior.

C. Opening Flashings: Coordinate installation of water-resistive barrier with opening flashings and items penetrating the plaster finish specified in related sections. Lap and sequence flashings with water-resistive barrier to shed water to the exterior and prevent retaining water within the wall or behind plaster assemblies. Direct all condensation to the building exterior.

D. Flexible Flashing: Install in locations indicated and underlying horizontal and sloped areas of plaster, in inset wall opening sills and similar locations; in accordance with the manufacturer's recommendations and as follows;
1. Substrate Preparation:
a. Smooth, clean, dry and free of voids, spalled areas, loose substrate, loose nails, sharp protrusions or other matter that will hinder the adhesion or regularity of installation.
b. Clean loose dust or dirt by wiping with a clean dry cloth or brush. Prime substrate with compatible primer in conditions recommended by flashing manufacturer.
2. Flashing Application:
a. Coordinate installation with weather-resistive barrier and metal or other flashings, interleave as required to weather all laps to drain, directing water to exterior.

b. Peel release paper from roll to expose rubberized asphalt and position flashing to center over joint location before application. Ensure flashing is centered over joint opening. Avoid fishmouths.
c. Press flashing firmly into place, ensure continuous and intimate contact with the substrate. Cut out wrinkles or other affected areas and replace.
d. Flashing shall be continuously supported by the substrate without spanning or bridging joints, gaps or voids in excess of 1/4 inch (6.4 mm). Minimum End Laps 2 inch (51 mm).

3. Install metal lath over flexible flashing.

3.03 ACCESSORIES

A. Expansion and Control Joint Locations: Provide as indicated, and additionally as specified here;
1. Locations and extents indicated on drawings are the minimum required. If no joints are shown on the drawings, provide joints as specified here and request confirmation of layout by Architect.
2. Provide additional control joints wherever required, ensure:
a. Maximum distance between joints horizontally or vertically shall not exceed twelve feet on center.
b. All cement plaster panels shall be defined by four straight, uninterrupted sides without re-entrant corners. Provide additional joints as required to avoid "inside" corners in any individual panel.

B. Set straight, plumb and level, and shim as required to proper grounds. Coordinate, trim or cope screeds and accessories to lap or be lapped with flashings and work provided by other sections. Ensure all laps of accessories, weather-resistive barrier and flashings weather to exterior.

C. Neatly miter or cope, corners and intersections of accessories to fit exposed edges. Make tight hairline joints.

D. Lap and caulk drip screeds and other exterior accessories at joints and intersections.

E. Continuously reinforce angles and fasten only at perimeter edges.

F. Place casing beads at terminations of plaster finish. Butt and align ends. Secure rigidly in place.

G. Extend screeds and accessories into niches and recesses, around interior and exterior wall corners, and around all sides of columns and similar building elements. Continue control joint patterns and molding alignments on walls of arcades, passages and all similar locations to match or extend those shown on exterior elevations, whether or not individual conditions are specifically shown, noted or elevated.

3.04 LATH

A. Apply metal lath taut, with long dimension using self-furring fasteners, perpendicular to supports, over continous weather-resistive barrier. Attach at maximum 6-inch intervals conforming to requirements of ASTM C1063.

B. Attach woven wire metal lath on sheathed wood stud walls using self furring fastener system.

C. Stagger ends of lath to differing supports. Lap all ends at supports.

D. Lap sides 1-1/2 inch and ends 1 inch minimum. Nest ribs of ribbed lath together.

E. Reinforce internal and external corners with lath.
1. Continuously reinforce internal angles with corner mesh, return metal lath 3-inches from corner to form the angle reinforcement; Fasten only at perimeter edges.

F. Apply strip reinforcement diagonally at corners of lathed openings. Secure rigidly in place.

G. Place 4 inch wide strips of metal lath centered over junctions of dissimilar backing materials. Secure rigidly in place.

H. Attach at soffits with hook staples or provide supplementary tying in accordance with the Referenced Standard.

3.05 PLASTERING

A. Metal Lath and Accessories: Verify lath is flat, secured to substrate, and joint and surface perimeter accessories are in place.

B. Apply plaster in accordance with ASTM C926.

C. Three-Coat Application Over Metal Lath:
   1. Apply first coat to a nominal thickness of 3/8 inch. Apply plaster scratch coat to embed lath completely so that no lath is visible. Scratch evenly for mechanical key. Allow to set before beginning to cure; damp cure until application of brown coat, 48-hours minimum.
   2. Apply second coat to a nominal thickness of 3/8 inch. Apply plaster brown coat evenly, within 7 days after application of scratch coat to evenly dampened scratch coat or to dry bond coat.
      a. Rod to true rough surface to accept finish coat.
      b. Allow to set before beginning cure. Damp cure for at least four days. Age seven days before applying finish coat.
   3. Apply finish coat to a nominal thickness of 1/8 inch. Apply evenly over dampened brown coat and within 7 days after application of preceding coat. Moist cure finish coat for at least 48 hours.

D. Moist cure base coats per CBC Table 2512.6.

E. After curing, dampen previous coat prior to applying finish coat.

F. Finish Texture: Fine sand float to a consistent and smooth finish.

G. Avoid excessive working of surface. Delay troweling as long as possible to avoid drawing excess fines to surface.

H. Moist cure finish coat for minimum period of 48 hours.

I. Complete all work in the same plane and panel each day, do not stop short.

3.06 TOLERANCES

A. Maximum Variation from True Flatness: 1/8 inch in 10 feet.

END OF SECTION

SECTION 09 3000

TILING

PART 1 GENERAL

1.00 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including Division 1 Specification Sections, apply to this section.

1.01 SECTION INCLUDES

A. Tile for floor applications.

B. Tile for wall applications.

C. Ceramic trim.

1.02 RELATED REQUIREMENTS

A. Section 09 2116 - Gypsum Board Assemblies: Tile backer board.

1.03 REFERENCE STANDARDS

A. ANSI A108/A118/A136.1 - American National Standard Specifications for the Installation of Ceramic Tile - Version; 2013.1.

B. ANSI A108.1A - American National Standard Specifications for Installation of Ceramic Tile in the Wet-Set Method, with Portland Cement Mortar; 2013.1.

C. ANSI A108.1B - American National Standard Specifications for Installation of Ceramic Tile on a Cured Portland Cement Mortar Setting Bed with Dry-Set or Latex-Portland Cement Mortar; 2013.1.

D. ANSI A108.1C - Specifications for Contractors Option: Installation of Ceramic Tile in the Wet-Set Method with Portland Cement Mortar or Installation of Ceramic Tile on a Cured Portland Cement Mortar Bed with Dry-Set or Latex-Portland Cement Mortar; 2013.1.

E. ANSI A108.5 - American National Standard Specifications for Installation of Ceramic Tile with Dry-Set Portland Cement Mortar or Latex-Portland Cement Mortar; 2013.1.

F. ANSI A108.6 - American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant, Water Cleanable Tile-Setting and -Grouting Epoxy; 2013.1.

G. ANSI A108.10 - American National Standard Specifications for Installation of Grout in Tilework; 2013.1.

H. ANSI A108.11 - American National Standard Specifications for Interior Installation of Cementitious Backer Units; 2013.1.

I. ANSI A118.3 - American National Standard Specifications for Chemical Resistant, Water Cleanable Tile-Setting and -Grouting Epoxy and Water Cleanable Tile-Setting Epoxy Adhesive; 2013.1.

J. ANSI A118.4 - American National Standard Specifications for Modified Dry-Set Cement Mortar; 2013.1.

K. ANSI A118.6 - American National Standard Specifications for Standard Cement Grouts for Tile Installation; 2013.1.

L. ANSI A118.15 - American National Standard Specifications for Improved Modified Dry-Set Cement Mortar; 2013.1.

M. ANSI A137.1 - American National Standard Specifications for Ceramic Tile - Version; 2013.1.

N. TCNA (HB) - Handbook for Ceramic, Glass, and Stone Tile Installation - Version; 2013.1.

1.04 SUBMITTALS

A. See Section 01 3300 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manufacturers' data sheets on tile, mortar, grout, and accessories. Include instructions for using grouts and adhesives.

C. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 6000 - Product Requirements, for additional provisions.

1.05 QUALITY ASSURANCE

A. Maintain one copy of and ANSI A108/A118/A136.1 and TCNA (HB) on site.

B. Manufacturer Qualifications: Company specializing in manufacturing the types of products specified in this section, with minimum 5 years of documented experience.

C. Installer Qualifications: Company specializing in performing tile installation, with minimum of 5 years of documented experience.

1.06 MOCK-UP

A. See Section 01 4000 - Quality Requirements, for general requirements for mock-up.

B. Construct tile mock-up where indicated on the drawings, incorporating all components specified for the location.
   1. Minimum size of mock-up is indicated on the drawings.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Protect adhesives from freezing or overheating in accordance with manufacturer's instructions.

1.08 FIELD CONDITIONS

A. Maintain ambient and substrate temperature of 50 degrees F (10 degrees C) during installation of mortar materials.

PART 2 PRODUCTS

2.01 TILE

A. Manufacturers: All products by the same manufacturer
   1. Substitutions: See Section 01 6000 – Product Requirements.

B. Ceramic Mosaic Tile: ANSI A137.1, and as follows:
   1. Moisture Absorption: 0 to 0.5 percent.
   2. Size and Shape: 2 inch square (50 mm square).
   3. Edges: Square.
   4. Color(s): To be selected by Architect from manufacturer's standard range.
   5. Trim Units: Matching bead, cove, and surface bullnose shapes in sizes coordinated with field tile.
   6. Products:
      a. Dal Tile Corporation.
      b. Emser Tile LLC.
      c. Substitutions: See Section 01 6000 - Product Requirements.

C. Glazed Wall Tile: ANSI A137.1, and as follows:
   1. Moisture Absorption: 3.0 to 7.0 percent.
   2. Size and Shape: 4-1/4 inch (108 mm) square.
   3. Edges: Cushioned.
   4. Surface Finish: High gloss.
   5. Color(s): To be selected by Architect from manufacturer's standard range.
   6. Pattern: as noted on documents.
   7. Trim Units: Matching bead, bullnose, cove, and base shapes in sizes coordinated with field tile.

D. Note: Replacement tile at Women’s Restroom is to match existing.

2.02 TRIM AND ACCESSORIES

A. Ceramic Trim: Matching bullnose, double bullnose, cove base, and cove ceramic shapes in sizes coordinated with field tile.

1. Manufacturers: Same as for tile.

B. Thresholds: Marble, white or gray, honed finish; 2 inches (50 mm) wide by full width of wall or frame opening; 1/2 inch (12 mm) thick; beveled one long edge with radiused corners on top side; without holes, cracks, or open seams.

C. Cementitious backer units: per 09-2116, 2.03 C.

2.03 SETTING MATERIALS

A. Provide setting materials made by the same manufacturer as grout.

B. Latex-Portland Cement Mortar Bond Coat: ANSI A118.4, ANSI A11815,.
   1. Applications: Use this type of bond coat where indicated and where no other type of bond coat is indicated.
   2. Products:
      a. ARDEX Engineered Cements; ARDEX X 77 MICROTEC: www.ardexamericas.com.
      b. LATICRETE International, Inc; LATICRETE 254 Platinum: www.laticrete.com.
      c. ProSpec, an Oldcastle brand; Permalastic System: www.prospec.com.

C. Mortar Bed Materials: Pre-packaged mix of Portland cement, sand, latex additive, and water.
   1. Products:
      a. AVM Industries, Inc; AVM Crete 6460: www.avmindustries.com.
      b. LATICRETE International, Inc; LATICRETE 3701 Fortified Mortar Bed: www.laticrete.com.

2.04 GROUTS

A. Manufacturers:
   1. ARDEX Engineered Cements: www.ardexamericas.com.
   2. ProSpec, an Oldcastle brand; ProColor Sanded Tile Grout: www.prospec.com.
   3. LATICRETE International, Inc; LATICRETE PERMACOLOR Grout: www.laticrete.com.
   4. Substitutions: See Section 01 6000 - Product Requirements.

B. Standard Grout: ANSI A118.6 standard cement grout.
   1. Applications: Use this type of grout where indicated and where no other type of grout is indicated.
   2. Use sanded grout for joints 1/8 inch wide and larger; use unsanded grout for joints less than 1/8 inch wide.
   3. Color(s): As selected by Architect from manufacturer's full line.
   4. Products:
      a. Bostik Inc: www.bostik-us.com.
      b. LATICRETE International, Inc; LATICRETE 1500 Sanded Grout: www.laticrete.com.
      c. ProSpec, an Oldcastle brand; ProColor Sanded Tile Grout: www.prospec.com.

C. Stain Resistant Grout Additive: Liquid admixture for sanded and unsanded cement-based grouts; mix with dry grout material in place of water.
   1. Applications: Where indicated.

D. Tile Sealant: Gunnable, silicone, siliconized acrylic, or urethane sealant; moisture and mildew resistant type.
   1. Applications: Between tile and plumbing fixtures.

E. Grout Sealer: Liquid-applied, moisture and stain protection for existing or new Portland cement grout.
   1. Composition: Water-based colorless silicone.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that sub-floor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive tile.

B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive tile.

C. Verify that sub-floor surfaces are dust-free and free of substances that could impair bonding of setting materials to sub-floor surfaces.

D. Verify that concrete sub-floor surfaces are ready for tile installation by testing for moisture emission rate and alkalinity; obtain instructions if test results are not within limits recommended by tile manufacturer and setting materials manufacturer.

3.02 PREPARATION

A. Protect surrounding work from damage.

B. Vacuum clean surfaces and damp clean.

C. Seal substrate surface cracks with filler. Level existing substrate surfaces to acceptable flatness tolerances.

3.03 INSTALLATION - GENERAL

A. Install tile, thresholds, and stair treads and grout in accordance with applicable requirements of ANSI A108.1A thru A108.13, manufacturer's instructions, and TCNA (HB) recommendations.

B. Lay tile to pattern indicated. Do not interrupt tile pattern through openings.

C. Cut and fit tile to penetrations through tile, leaving sealant joint space. Form corners and bases neatly. Align floor joints.

D. Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make grout joints without voids, cracks, excess mortar or excess grout, or too little grout.

E. Form internal angles square and external angles bullnosed.

F. Install thresholds where indicated.

G. Sound tile after setting. Replace hollow sounding units.

H. Keep control and expansion joints free of mortar, grout, and adhesive.

I. Prior to grouting, allow installation to completely cure; minimum of 48 hours.

J. Grout tile joints unless otherwise indicated. Use standard grout unless otherwise indicated.

K. At changes in plane and tite-to-tile control joints, use tile sealant instead of grout, with either bond breaker tape or backer rod as appropriate to prevent three-sided bonding.

3.04 INSTALLATION - FLOORS - MORTAR BED METHODS

A. Over exterior concrete substrates, install in accordance with TCNA (HB) Method F101, bonded, with standard grout.

B. Mortar Bed Thickness: 5/8 inch (15 mm), unless otherwise indicated.

3.05 INSTALLATION - WALL TILE

A. Over cementitious backer units on studs, install in accordance with TCNA (HB) Method W244, using membrane at toilet rooms.

3.06 CLEANING

A. Clean tile and grout surfaces.

3.07 PROTECTION

A. Do not permit traffic over finished floor surface for 4 days after installation.

END OF SECTION

SECTION 09 5100
ACOUSTICAL CEILINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Suspended metal grid ceiling system.

B. Acoustical units.

1.02 RELATED REQUIREMENTS

A. Section 23 3000 - Air Outlets and Inlets: Air diffusion devices in ceiling.

B. Section 26 5100 - Interior Lighting: Light fixtures in ceiling system.

C. Drawings and general provisions of Contract, including Division 1 Specification Sections, apply to this section.

1.03 REFERENCE STANDARDS

A. ASTM C635/C635M - Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings; 2013a.

B. ASTM E1264 - Standard Classification for Acoustical Ceiling Products; 2014.

C. LEED :Low Emitting Materials Standard

1.04 SUBMITTALS

A. Shop Drawings: Indicate grid layout and related dimensioning.

B. Product Data: Provide data on suspension system components.

C. Manufacturer's Installation Instructions: Indicate special procedures.

1.05 QUALITY ASSURANCE

A. Suspension System Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

B. Acoustical Unit Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

1.06 FIELD CONDITIONS

A. Maintain uniform temperature of minimum 60 degrees F (16 degrees C), and maximum humidity of 40 percent prior to, during, and after acoustical unit installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. All products by same manufacturer.

2.02 ACOUSTICAL UNITS

A. Manufacturers:
   1. Armstrong World Industries, Inc: www.armstrong.com.
   2. Substitutions: See Section 01 6000 - Product Requirements.

B. Acoustical Units - General: ASTM E1264, Class A.

C. Acoustical Panels Type “Cortega” 704A: Painted mineral fiber, ASTM E1264 Type III, with the following characteristics:
   1. VOC Content: Certified as Low Emission by one of the following:
      a. LEED Low Emitting Material.
   2. Size: 24 by 24 inches (600 by 1200 mm).
   3. Thickness: 5/8 inches.
   4. Composition: Wet formal mineral fiber.
   5. NRC Range: 0..55, determined in accordance with ASTM E1264.
   6. Edge: Angled Tegular.

7. Surface Color: White.
8. Surface Pattern: Cortega.
9. Suspension System: Exposed grid Type “Prelude XL” or equal.

2.03 SUSPENSION SYSTEM(S)

A. Suspension Systems - General: Complying with ASTM C635/C635M; die cut and interlocking components, with stabilizer bars, clips, splices, perimeter moldings, and hold down clips as required.

B. Exposed Steel Suspension System “Type XL”: Formed steel, commercial quality cold rolled; heavy-duty.
   1. Profile: Tee; 15/16 inch (24 mm) wide face.
   2. Construction: Double web.
   3. Finish: White painted.

2.04 ACCESSORIES

A. Support Channels and Hangers: Galvanized steel; size and type to suit application, seismic requirements, and ceiling system flatness requirement specified.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that layout of hangers will not interfere with other work.

3.02 INSTALLATION - SUSPENSION SYSTEM

A. Rigidly secure system, including integral mechanical and electrical components, for maximum deflection of 1:360.

B. Install after major above-ceiling work is complete. Coordinate the location of hangers with other work.

C. Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.

D. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance.

E. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability.

F. Support fixture loads using supplementary hangers located within 6 inches (150 mm) of each corner, or support components independently.

G. Do not eccentrically load system or induce rotation of runners.

3.03 INSTALLATION - ACOUSTICAL UNITS

A. Install acoustical units in accordance with manufacturer's instructions.

B. Fit acoustical units in place, free from damaged edges or other defects detrimental to appearance and function.

C. Fit border trim neatly against abutting surfaces.

D. Install units after above-ceiling work is complete.

E. Install acoustical units level, in uniform plane, and free from twist, warp, and dents.

F. Cutting Acoustical Units:
   1. Make field cut edges of same profile as factory edges.

3.04 TOLERANCES

A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet (3 mm in 3 m).

B. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees.

END OF SECTION

SECTION 09 6105.01

VAPOR CONTROL FOR FLOORING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Vapor and Alkalinity Control Coating for new and existing concrete slabs receiving floor finishes specified in related sections.

B. Accessories.

1.02 RELATED SECTIONS

A. Section 07-9200 - Joint Sealers: Sealant for joints in substrates.

B. Pertinent sections specifying finish floor materials.

C. Drawings and general provisions of Contract, including Division 1 Specification Sections, apply to this Section.

1.03 REFERENCES

A. ASTM F 1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride, latest Edition.

B. SCAQMD 1168 - South Coast Air Quality Management District Rule No.1168; current edition; www.aqmd.gov.

C. Vapor Control Manufacturer's installation instructions and recommendations.

D. Finish Flooring Manufacturer's installation instructions and recommendations in related sections.

1.04 PERFORMANCE REQUIREMENTS

A. Vapor-proof all concrete floor slabs to receive resilient flooring, sheet, tile, sports, carpet, and fluid applied.
   1. Reduce water vapor transmissions from a negative side of a concrete substrate to acceptable levels for all floor finishes and warranted for a period of fifteen (15) years from date of acceptance.

B. Provide substrate suitable for installation of flooring by other sections, ensure provision of full warranty and service life of those finishes by their respective manufacturers.

C. Compatible with all types of floor finishes, including but not limited to the following:
   1. Resilient flooring, including rubber, sheet vinyl and linoleum;
   2. Carpet, including vinyl-backed type;
   3. Fluid-applied flooring.

D. For convenience in identifying products, manufacturer's proprietary names or catalog numbers may be indicated. Unless modified by Specifications or notation on Drawings, manufacturer's complete product catalog description for indicated product name or number shall constitute requirements for each product. Products shall incorporate all features set forth in the manufacturer's catalog description for the standard item, except for such modifications thereto as may be indicated in the Contract Documents.

1.05 SUBMITTALS

A. Product Data: Provide data for joint and crack treatment details, sealants, membrane, and application rates. Submit sample copy of warranty including all specified provisions in WARRANTY article. Demonstrate compliance with specified VOC emissions standards.

B. Shop Drawings: Indicate special joint or termination conditions and conditions of interface with other materials.

C. Test Reports: Certified ASTM Test Reports demonstrating performance requirements complying with specified standards.

D. Certificate: Certify that products meet or exceed specified requirements. Provide manufacturer's approval of applicator, demonstrate qualifications specified in Article titled QUALITY ASSURANCE.

E. Manufacturer's Installation Instructions: Indicate special procedures for colored concrete as may apply.

F. Field Reports: Provide the following;
   1. Prior to start of application: Manufacturer's Representative written acceptance of site conditions including:
      a. Environmental conditions
      b. Concrete mix design, including all admixtures
      c. Concrete salts
      d. Under-slab vapor barrier (for slab-on-grade applications)
      e. Curing methods
      f. Concrete surface strength.
   2. During and at completion of application: Manufacturer's Representative daily field reports, including records of non-conforming conditions and method of resolution.

G. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner 's name and registered with manufacturer.

1.06 QUALITY ASSURANCE

A. Manufacturer/Product Qualifications: Product to have at least a 5 year documented history in controlling moisture vapor emission from damaging floor covering, compatible with all floor finish materials.

B. Installer Qualifications: Applicator experienced with installation of product and certified by manufacturer, or applicator experienced with similar products and providing manufacturer's field technician on site to advise on application procedures; and providing adequate number of skilled workers trained and familiar with application requirements.

1.07 MOCK-UP

A. Construct mock-up consisting of one room, to represent finished work.

B. Owner's testing agency will test mock-up for compliance to standards listed in related sections.

C. Locate where directed.

D. Mock-up may remain as part of the Work.

1.08 PREINSTALLATION MEETING

A. Two Weeks Prior to Installation Start: Owner Representative, Architect, Contractor and Vapor Control Installer and installers of floor coverings in related sections shall review ASTM F 1869 testing results, building temperature, interior humidity and site conditions. Installer will provide specified vapor-alkalinity control barrier installation procedures and application details.

1.09 DELIVERY, STORAGE, AND HANDLING

A. Deliver product in factory numbered and sealed drums, with numbers recorded for Owner's records.

B. Store products in manufacturer's unopened drums until ready for installation.

1.10 ENVIRONMENTAL REQUIREMENTS

A. Maintain ambient temperatures in the range recommended by the Vapor Control Coating manufacturer for 72 hours before and during application and until cured.

B. Do not install products until final finishing and soft cutting operations are complete and concrete surface has hardened sufficiently to support foot traffic.

1.11 WARRANTY

A. See Section 01-7800 - Closeout Submittals, for additional warranty requirements.

B. Correct defective Work within a fifteen (15) year period after Date of Substantial Completion.

C. Provide fifteen (15) year manufacturer warranty for substrate to meet specified performance and resist penetration of water, except where such failures are the result of structural failures of building. Hairline cracking of concrete due to temperature change or shrinkage is not considered a structural failure.

D. For warranty repair work, remove and replace vapor control coating, flooring finish materials and related accessories at no cost to Owner.

PART 2 PRODUCTS

2.01 VAPOR CONTROL COATING - MULTIPLE COAT APPLICATION - NEW AND EXISTING CONCRETE

A. Multi-coat epoxy or urethane formula, ultra low viscosity, VOC compliant, low odor, non-corrosive, microbial resistant and elastomeric properties to expand and contract with slab movement; formulated to saturate concrete surfaces and mechanically restrict moisture and alkalinity levels, and conforming to the following:
   1. Concrete Relative Humidity Tolerance: 95%RH, ASTM F2170
   2. Alkali resistance: Resistant to 30 day exposure, 14pH, ASTM D 1308.
   3. Adhesion strength: > 250 psi, (100% concrete failure), ASTM D 4541.
   4. VOC Content: < 99 gram per liter, EPA Method 24

B. Manufacturer / Product:
   1. Synthetic 10-E manufactured by Synthetics International, Tustin CA; www.syntheticsIntl.com.
   2. MC Ultra Moisture Control System, by Ardex Engineered Cements, Mansfield, TX; www.ardex.com.
   3. System II by Floor Seal Technology, Milpitas CA; www.floorseal.com.
   4. Penetrating materials containing sodium or potassium silicates do not meet performance levels specified in this specification and will not be considered for substitution. Penetrating silicate based solutions are chemically reactive, non-resin based, non inner- surface forming and do not meet specified ASTM E 96 water vapor reduction levels and ASTM D 4541 pull off adhesion testing requirements.

C. Primers and Patching Compounds:
   1. Manufacturer approved:
      a. Two-component non-porous primer
      b. Calcium aluminate based patching compound capable of a single or multi coat application thickness of ¼" and not less than 4,100 psi per ASTM C 109.

2.02 ACCESSORIES

A. Water: Clean, potable.

B. Accessories and application equipment: As recommended by manufacturer and as required for proper installation.

C. All other materials necessary for complete and functional installation as recommended or required by the manufacturer.

D. Sealant for Substrate Joints: Type specified in Section 07-9200.

E. Testing Equipment: ASTM F 1869 Calcium Chloride Dome Test; American Moisture Test, (866) 670-9700, www.DomeTest.com.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.
   1. Verify substrate surfaces are free of frozen matter, dampness, loose particles, cracks, pits, projections, penetrations, or foreign matter detrimental to adhesion or application of vapor control system.

2. Verify that substrate surfaces are smooth, free of honeycomb or pitting, and not detrimental to full contact bond of waterproofing materials. Cracks no longer subject to further movement.

B. Verify items which penetrate surfaces to receive waterproofing are securely installed.

C. Correct unsatisfactory preparation before proceeding.

3.02 PREPARATION

A. Protect adjacent surfaces not designated to receive waterproofing.

B. Concrete Substrates: Shot blast field and grind near walls. Clean joints and cracks. Follow vapor-alkalinity control coating manufacturer specifications for shot blast profiles

C. Clean and prepare surfaces to receive vapor control coatings in accordance with manufacturer's instructions. Vacuum substrate clean.

D. Do not apply waterproofing to surfaces unacceptable to manufacturer.

E. Seal cracks and joints with sealant using methods recommended by sealant manufacturer.

3.03 APPLICATION - NEW CONCRETE

A. Apply vapor control coating products to new concrete as soon as the concrete is firm enough to work on after troweling and prior to any other chemical treatments for concrete slabs.
   1. Apply product to the concrete slabs as soon as final finishing operations are complete and the concrete has hardened sufficiently to sustain foot traffic without damage.
   2. Spray apply product at the manufacturer's recommended rate. If puddling or "bird-bathing" occurs, lightly broom product evenly over the substrate until product has completely penetrated the surface.
   3. Continue brooming product evenly over the substrate until the product has completely penetrated into the concrete slab.
   4. If heavy rainfall and puddling occurs within 2 hours after initial application, reapply product to affected areas as soon as weather conditions permit.

3.04 APPLICATION - EXISTING CONCRETE

A. Apply vapor control coating products to produce vapor reduction level required for specified floor finish to achieve optimum adhesion to substrate. Coverage rate determined by coating manufacturer based on the surface texture and porosity of the substrates.

B. Topcoat: When recommended by vapor control coating product manufacturer, apply non-porous primer and install in accordance with manufacturer’s recommendations. Provide smooth, fully compatible substrate for floor coverings.

C. Curing: Allow coating to cure in accordance with coating manufacturer’s recommendations before installation of floor finishes.

3.05 FIELD QUALITY CONTROL

A. Owner's Testing Agency shall verify that concrete sub-floor surfaces are ready for finish flooring installation by testing for moisture emission rate and alkalinity. Results obtained by the Testing Agency shall be definitive. Re-apply vapor control coatings until test results are within the following limits:
   1. Moisture emission rate: Not greater than 3 lb per 1000 sq ft per 24 hours when tested using calcium chloride moisture test kit per ASTM F1869 for 72 hours.
   2. Alkalinity: pH range of 5-9.

B. Guarantee final surfaces are ready for floor coverings, requiring no special adhesives or procedures. Flooring installation methods remain as specified for all flooring types indicated.

3.06 PROTECTION

A. Protect installed floors until product is absorbed or cured as appropriate to installation method.

B. Precautions and cleaning are the responsibility of the Contractor until Substantial Completion.

C. Do not permit traffic over unprotected or uncovered membrane.

3.07 SCHEDULE

A. Provide Vapor and Alkalinity Control coating suitable for new concrete where occurs. Provide Vapor and Alkalinity Control coating suitable for existing concrete at all other locations. Provide each product type (new and existing) by a single manufacturer. A different product may be used at each floor type.

B. Provide Vapor and Alkalinity Control coatings for all interior concrete slabs-on-grade scheduled to receive the following finishes:
   1. Resilient flooring, including resilient athletic flooring, rubber, sheet vinyl and linoleum, resilient tile;
   2. Carpet;
   3. Fluid-applied flooring.

END OF SECTION

SECTION 09 6500
RESILIENT FLOORING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Resilient tile flooring.

B. Resilient base.

C. Installation accessories.

1.02 RELATED REQUIREMENTS

A. Section 09105.01 - Vapor Control for Flooring

B. Drawings and general provisions of Contract, including Division 1 Specification Sections, apply to this Section.

1.03 REFERENCE STANDARDS

A. ASTM F1066 - Standard Specification for Vinyl Composition Floor Tile; 2004 (Reapproved 2010)e1.

B. ASTM F1861 - Standard Specification for Resilient Wall Base; 2008 (Reapproved 2012)e1.

1.04 SUBMITTALS

A. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.

B. Selection Samples: Submit manufacturer's complete set of color samples for Architect's initial selection.

C. Verification Samples: Submit two samples, 12 by 12 inch in size illustrating color and pattern for each resilient flooring product specified.

D. Concrete Testing Standard: Submit a copy of ASTM F710.

E. Certification: Prior to installation of flooring, submit written certification by flooring manufacturer and adhesive manufacturer that condition of sub-floor is acceptable.

F. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.

G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. Extra Flooring Material: 10 square feet of each type and color.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Upon receipt, immediately remove any shrink-wrap and check materials for damage and the correct style, color, quantity and run numbers.

B. Store all materials off of the floor in an acclimatized, weather-tight space.

C. Maintain temperature in storage area between 55 degrees F (13 degrees C) and 90 degrees F (72 degrees C).

1.06 FIELD CONDITIONS

A. Maintain temperature in storage area between 55 degrees F (13 degrees C) and 90 degrees F (72 degrees C).

B. Store materials for not less than 48 hours prior to installation in area of installation at a temperature of 70 degrees F (21 degrees C) to achieve temperature stability. Thereafter, maintain conditions above 55 degrees F (13 degrees C).

PART 2 PRODUCTS

2.01 TILE FLOORING

A. Vinyl Composition Tile: Homogeneous, with color extending throughout thickness.

1. Minimum Requirements: Comply with ASTM F1066, of Class corresponding to type specified.
2. Size: 12 by 12 inch (305 by 305 mm).
3. Thickness: 0.125 inch (3.2 mm).
4. Pattern: Solid color.
5. Manufacturers:
    a. Armstrong World Industries, Inc; Excelon 12x12: www.armstrong.com.
    b. Johnsonite, a Tarkett Company; Azrock 12x12: www.johnsonite.com.

2.02 RESILIENT BASE

A. Resilient Base: ASTM F1861, Type TS rubber, vulcanized thermoset; top set Style B, Cove.
1. Height: 4 inch (100 mm).
2. Thickness: 0.125 inch (3.2 mm) thick.
3. Finish: Satin.
4. Color: Color as selected from manufacturer's standards.
5. Accessories: Premolded external corners and end stops.
6. Manufacturers:
    a. Burke Flooring: www.burkemercer.com.
    b. Johnsonite, a Tarkett Company: www.johnsonite.com.

2.03 ACCESSORIES

A. Subfloor Filler: White premix latex; type recommended by adhesive material manufacturer.

B. Primers, Adhesives, and Seaming Materials: Waterproof; types recommended by flooring manufacturer.

C. Cement Topcoat: Self – levelling , non-gypsum based, 1/8” thick,4,200 PSI@28 days and flooring -ready not more than twenty four hours after installation. Type recommended by vapor control coating manufacturer to suit application. Primer over vapor control coating: non porous type as recommended by vapor control manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces are flat to tolerances acceptable to flooring manufacturer, free of cracks that might telegraph through flooring, clean, dry, and free of curing compounds, surface hardeners, and other chemicals that might interfere with bonding of flooring to substrate.

3.02 PREPARATION

A. Prepare floor substrates as recommended by flooring and adhesive manufacturers.

B. Remove sub-floor ridges and bumps. Fill minor low spots, cracks, joints, holes, and other defects with sub-floor filler to achieve smooth, flat, hard surface.

C. Prohibit traffic until filler is cured.

3.03 INSTALLATION

A. Starting installation constitutes acceptance of sub-floor conditions.

B. Install in accordance with manufacturer's instructions.

C. Spread only enough adhesive to permit installation of materials before initial set.

D. Fit joints tightly.

E. Set flooring in place, press with heavy roller to attain full adhesion.

F. Where type of floor finish, pattern, or color are different on opposite sides of door, terminate flooring under centerline of door.

G. Install edge strips at unprotected or exposed edges, where flooring terminates, and where indicated.

H. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.

3.04 TILE FLOORING

A. Mix tile from container to ensure shade variations are consistent when tile is placed, unless manufacturer's instructions say otherwise.

3.05 RESILIENT BASE

A. Fit joints tightly and make vertical. Maintain minimum dimension of 18 inches (45 mm) between joints.

B. Install base on solid backing. Bond tightly to wall and floor surfaces.

3.06 CLEANING

A. Remove excess adhesive from floor, base, and wall surfaces without damage.

B. Clean in accordance with manufacturer's instructions.

3.07 PROTECTION

A. Prohibit traffic on resilient flooring for 48 hours after installation.

END OF SECTION

SECTION 09 9000
PAINTING AND COATING

PART 1 GENERAL

1.00 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including Division 1 Specifications, apply to this section.

1.01 SECTION INCLUDES

A. Surface preparation.

B. Field application of paints.

C. Scope: Finish all interior and exterior surfaces exposed to view, unless fully factory finished.

D. Do Not Paint or Finish the Following Items:
   1. Items fully factory-finished unless specifically so indicated; materials and products having factory-applied primers are not considered factory finished.
   2. Items indicated to receive other finishes.
   3. Items indicated to remain unfinished.
   4. Fire rating labels, equipment serial number and capacity labels, and operating parts of equipment.
   5. Floors, unless specifically so indicated.
   6. Glass.
   7. Concealed pipes, ducts, and conduits.

1.02 REFERENCE STANDARDS

A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency; current edition.

1.03 SUBMITTALS

A. Product Data: Provide complete list of all products to be used, with the following information for each:
   1. Manufacturer's name, product name and/or catalog number, and general product category (e.g. "alkyd enamel").
   2. MPI product number (e.g. MPI #47).
   3. Cross-reference to specified paint system(s) product is to be used in; include description of each system.

B. Samples: Submit three paper "draw down" samples, 8-1/2 by 11 inches (216 by 279 mm) in size, illustrating range of colors available for each finishing product specified.
   1. Where sheen is specified, submit samples in only that sheen.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum three years documented experience.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.

B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.

C. Paint Materials: Store at minimum ambient temperature of 45 degrees F (7 degrees C) and a maximum of 90 degrees F (32 degrees C), in ventilated area, and as required by manufacturer's instructions.

1.06 FIELD CONDITIONS

A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.

B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.

C. Provide lighting level of 80 ft candles (860 lx) measured mid-height at substrate surface.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Provide all paint and coating products used in any individual system from the same manufacturer; no exceptions.

B. Provide all paint and coating products from the same manufacturer to the greatest extent possible.

C. Paints:
   1. Benjamin Moore & Co: www.benjaminmoore.com.
   2. Sherwin-Williams Company: www.sherwin-williams.com.

D. Primer Sealers: Same manufacturer as top coats.

2.02 PAINTS AND COATINGS - GENERAL

A. Paints and Coatings: Ready mixed, unless intended to be a field-catalyzed coating.
   1. Provide paints and coatings of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
   2. Provide materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
   3. Supply each coating material in quantity required to complete entire project's work from a single production run.
   4. Do not reduce, thin, or dilute coatings or add materials to coatings unless such procedure is specifically described in manufacturer's product instructions.

B. Primers: As follows unless other primer is required or recommended by manufacturer of top coats; where the manufacturer offers options on primers for a particular substrate, use primer categorized as "best" by the manufacturer.
   1. Gypsum Board: Interior Latex Primer Sealer; MPI #50.

C. Volatile Organic Compound (VOC) Content:
   1. Provide coatings that comply with the most stringent requirements specified in the following:
      a. 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.
      b. Architectural coatings VOC limits of the State in which the Project is located.
   2. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site; or other method acceptable to authorities having jurisdiction.

D. Provide paint colors as specified by the Architect after receipt of Paint Submittal.

2.03 PAINT SYSTEMS - EXTERIOR

A. Paint E-OP - All Exterior Surfaces Indicated to be Painted, Unless Otherwise Indicated: Including concrete, concrete masonry, primed metal, and plaster.
   1. Preparation as specified by manufacturer.
   2. Two top coats and one coat primer recommended by manufacturer.

B. Paint CE-OP-3L - Masonry/Concrete, Opaque, Latex, 3 Coat:
   1. One coat of block filler.

C. Paint MgE-OP-3L - Galvanized Metals, Latex, 3 Coat:
   1. One coat galvanize primer.
   2. Semi-gloss: Two coats of latex enamel.

D. Paint E-Pav - Pavement Marking Paint:
   1. White: One coat, with reflective particles; and Blue as noted on plans.

2.04 PAINT SYSTEMS – INTERIOR

A. Paint GI-OP-#A-Z Gypsum Board, Acrylic Enamel Zero VOC, 3-Coat
   1. One coat of low-odor zero VOC acrylic copolymer primer sealer, pigmented.
      Dunn Edwards one coat of Ecoshield W600.
      Eggshell: Two coats of low odor zero VOC acrylic enamel;
      Dunn Edwards one coat of Ecoshield W602

2.05 ACCESSORY MATERIALS

A. Accessory Materials: Provide all primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials required to achieve the finishes specified whether specifically indicated or not; commercial quality.

B. Patching Material: Latex filler.

C. Fastener Head Cover Material: Latex filler.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces are ready to receive work as instructed by the product manufacturer.

B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.

C. Test shop-applied primer for compatibility with subsequent cover materials.

3.02 PREPARATION

A. Clean surfaces thoroughly and correct defects prior to coating application.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces or finishing.

D. Seal surfaces that might cause bleed through or staining of topcoat.

E. Remove mildew from impervious surfaces by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.

F. Galvanized Surfaces to be Painted: Remove surface contamination and oils and wash with solvent. Apply coat of etching primer.

3.03 APPLICATION

A. Exterior Wood to Receive Opaque Finish: If final painting must be delayed more than 2 weeks after installation of woodwork, apply primer within 2 weeks and final coating within 4 weeks.

B. Apply products in accordance with manufacturer's instructions.

C. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.

D. Apply each coat to uniform appearance.

E. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.

END OF SECTION

SECTION 21 1313

FIRE SUPPRESSION

PART 1 GENERAL

1.01 SUMMARY

A. Section includes complete fire suppression system including sprinkler.

1.02 SYSTEM DESCRIPTION

A. Sprinkler System: Conform to the following criteria:
   1. Coverage for modified office area and upgrades of system to current code requirements.
   2. Design system hydraulically to NFPA 13.
   3. System performance to maintain current hazard occupancy requirements.

1.03 SUBMITTALS

A. Shop Drawings: Indicate pipe layout, supports, components, accessories, sizes, and hydraulic calculations.

B. Product Data: Submit data for pipe materials used, valves, manufacturer's catalog sheet for equipment indicating rough-in size, finish, accessories, and power requirements.

C. Manufacturer's Certificate: Certify system has been tested and meets or exceeds specified requirements.

1.04 CLOSEOUT SUBMITTALS

A. Project Record Documents: Record actual locations of sprinkler heads.

B. Operation and Maintenance Data: Submit description of components of system, servicing requirements, record drawings, inspection data, and parts lists.

1.05 QUALITY ASSURANCE

A. Perform Work in accordance with:
   1. Sprinkler Systems: NFPA 13.

B. Maintain one copy of each document on site.

C. Design fire suppression system under direct supervision of Professional Engineer experienced in design of this Work and licensed in State of California.

PART 2 PRODUCTS

2.01 PIPE AND TUBE

A. Steel Pipe: ASTM A53, Grade B, black.

1. Steel Fittings: ASME B16.9, wrought steel, butt welded; ASME B16.25, butt weld ends; ASTM A234/A234M, wrought carbon steel and alloy steel; ASME B16.5, steel flanges and fittings.
2. Cast Iron Fittings: ASME B16.4, threaded fittings.
3. Malleable Iron Fittings: ASME B16.3, threaded type; ASTM A47.
4. Mechanical Grooved Couplings: Malleable iron housing, "C" shaped elastomeric sealing gasket, steel bolts, nuts, and washers; galvanized for galvanized pipe.

2.02 GATE VALVES

A. Up to and including 2 inches: Bronze body and trim, rising stem, hand wheel, solid wedge or disc, threaded ends.

B. Over 2 inches: Iron body, bronze trim, rising stem pre-grooved for mounting tamper switch, hand wheel, OS&Y, solid bronze or cast iron wedge, flanged or grooved ends.

2.03 SPRINKLERS

A. Furnish materials in accordance with California Fire Code and NFPA 13.

B. Suspended Ceiling Type: Semi-recessed pendant type with chrome plated finish, and matching escutcheon.

C. Exposed Area Type: Standard upright type with brass finish.

D. Sidewall Type: Semi-recessed horizontal sidewall type chrome plated finish with matching escutcheon.

E. Guards: Finish to match sprinkler head.

2.04 SPRINKLER PIPING SPECIALTIES

A. Furnish materials in accordance with California Fire Code and NFPA 13.

B. Wet Pipe Sprinkler Alarm Valve: Check type valve with electrically or hydraulically operated alarms, with pressure retard chamber and variable pressure trim.

C. Electric Alarm: Electrically operated red enameled gong with pressure alarm switch.

D. Water Flow Switch: Vane type switch with two contacts.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance NFPA 13.

B. Ream pipe and tube ends to full inside diameter. Remove burrs and bevel plain end ferrous pipe.

C. Remove scale and foreign material, inside and outside, before assembly.

D. Install sleeves where penetrating footings, floors, or walls. Seal pipe and sleeve penetration to maintain fire resistance equivalent to fire separation of footings, floors, or walls.

E. Install pipe runs to minimize obstruction to other work. Offset around ductwork.

F. Install piping in concealed spaces above finished ceilings.

G. Install heads to coordinate with reflected ceiling plan. Center two directions in ceiling tiles.

H. Protection:
   1. Apply temporary tape or paper cover to sprinkler heads to protect from painting.
   2. Protect concealed sprinkler head cover plates from painting.

I. Interface sprinkler system with building fire and smoke alarm system as required.

J. Flush entire piping system of foreign matter.

K. Hydrostatically test entire system. Schedule test to be witnessed by Fire Marshall.

END OF SECTION

SECTION 22 0517

SLEEVES AND SLEEVE SEALS FOR PLUMBING PIPING

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Sleeves.
   2. Sleeve-seal systems.
   3. Grout.

1.02 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

PART 2 - PRODUCTS

2.01 SLEEVES

A. Cast-Iron Wall Pipes: Cast or fabricated of cast or ductile iron and equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop unless otherwise indicated.

B. Galvanized-Steel Wall Pipes: ASTM A 53/A 53M, Schedule 40, with plain ends and welded steel collar; zinc coated.

C. Galvanized-Steel-Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, zinc coated, with plain ends.

D. PVC-Pipe Sleeves: ASTM D 1785, Schedule 40.

E. Galvanized-Steel-Sheet Sleeves: 0.0239-inch minimum thickness; round tube closed with welded longitudinal joint.

2.02 SLEEVE-SEAL SYSTEMS

A. Manufacturers: Subject to compliance with requirements, provide Advance Products & Systems or comparable product by one of the following:
   1. CALPICO, Inc.
   2. Metraflex Company (The).
   3. Pipeline Seal and Insulator, Inc.
   4. Proco Products, Inc.

B. Description: Modular sealing-element unit, designed for field assembly, for filling annular space between piping and sleeve.
   1. Sealing Elements: EPDM-rubber interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.
   2. Pressure Plates: Plastic.
   3. Connecting Bolts and Nuts: Stainless steel of length required to secure pressure plates to sealing elements.

2.03 GROUT

A. Standard: ASTM C 1107/C 1107M, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.
B. Characteristics: Nonshrink; recommended for interior and exterior applications.
C. Design Mix: 5000-psi, 28-day compressive strength.
D. Packaging: Premixed and factory packaged.

PART 3 - EXECUTION

3.01 SLEEVE INSTALLATION

A. Install sleeves for piping passing through penetrations in floors, partitions, roofs, and walls.

B. For sleeves that will have sleeve-seal system installed, select sleeves of size large enough to provide 1-inch annular clear space between piping and concrete slabs and walls.
   1. Sleeves are not required for core-drilled holes.

C. Install sleeves in concrete floors, concrete roof slabs, and concrete walls as new slabs and walls are constructed.
   1. Cut sleeves to length for mounting flush with both surfaces.
      a. Exception: Extend sleeves installed in floors of mechanical equipment areas or other wet areas 2 inches above finished floor level.
   2. Using grout, seal the space outside of sleeves in slabs and walls without sleeve-seal system.

D. Install sleeves for pipes passing through interior partitions.
   1. Cut sleeves to length for mounting flush with both surfaces.
   2. Install sleeves that are large enough to provide 1/4-inch annular clear space between sleeve and pipe or pipe insulation.
   3. Seal annular space between sleeve and piping or piping insulation; use joint sealants appropriate for size, depth, and location of joint.

E. Fire-Barrier Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at pipe penetrations. Seal pipe penetrations with firestop materials.

3.02 SLEEVE-SEAL-SYSTEM INSTALLATION

A. Install sleeve-seal systems in sleeves in exterior concrete walls and slabs-on-grade at service piping entries into building.

B. Select type, size, and number of sealing elements required for piping material and size and for sleeve ID or hole size. Position piping in center of sleeve. Center piping in penetration, assemble sleeve-seal system components, and install in annular space between piping and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make a watertight seal.

3.03 SLEEVE AND SLEEVE-SEAL SCHEDULE

A. Use sleeves and sleeve seals for the following piping-penetration applications:
   1. Exterior Concrete Walls above Grade:
      a. Piping Smaller Than 6 inches: Galvanized-steel wall sleeves.
   2. Interior Partitions:
      a. Piping Smaller Than 6 inches: PVC-pipe sleeves.

END OF SECTION

SECTION 22 0518

ESCUTCHEONS FOR PLUMBING PIPING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Escutcheons.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

PART 2 - PRODUCTS

2.1 ESCUTCHEONS

A. One-Piece, Cast-Brass Type: With polished, chrome-plated finish and setscrew fastener.

B. One-Piece, Deep-Pattern Type: Deep-drawn, box-shaped brass with chrome-plated finish and spring-clip fasteners.

C. One-Piece, Stamped-Steel Type: With chrome-plated finish and spring-clip fasteners.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install escutcheons for piping penetrations of walls, ceilings, and finished floors.

B. Install escutcheons with ID to closely fit around pipe, tube, and insulation of piping and with OD that completely covers opening.
   1. Escutcheons for New Piping:
      a. Piping with Fitting or Sleeve Protruding from Wall: One-piece, deep-pattern type.
      b. Chrome-Plated Piping: One-piece, cast-brass type with polished, chrome-plated finish.
      c. Insulated Piping: One-piece, stamped-steel type.
      d. Bare Piping at Wall and Floor Penetrations in Finished Spaces: One-piece, cast-brass type with polished, chrome-plated finish.
      e. Bare Piping at Wall and Floor Penetrations in Finished Spaces: One-piece, stamped-steel type.

3.2 FIELD QUALITY CONTROL

A. Replace broken and damaged escutcheons using new materials.

END OF SECTION

SECTION 22 0523

GENERAL-DUTY VALVES FOR PLUMBING PIPING

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Brass ball valves.
   2. Bronze ball valves.

B. Related Sections:
   1. Division 22 plumbing piping Sections for specialty valves applicable to those Sections only.
   2. Division 22 Section "Identification for Plumbing Piping and Equipment" for valve tags and schedules.

1.02 ACTION SUBMITTALS

A. Product Data: For each type of valve indicated.

1.03 QUALITY ASSURANCE

A. ASME Compliance: ASME B16.10 and ASME B16.34 for ferrous valve dimensions and design criteria.

B. NSF Compliance: NSF 61 for valve materials for potable-water service.

PART 2 - PRODUCTS

2.01 GENERAL REQUIREMENTS FOR VALVES

A. Refer to valve schedule articles for applications of valves.

B. Valve Pressure and Temperature Ratings: Not less than indicated and as required for system pressures and temperatures.

C. Valve Sizes: Same as upstream piping unless otherwise indicated.

D. Valve Actuator Types:
   1. Handlever: For quarter-turn valves NPS 6 and smaller.

E. Valves in Insulated Piping: With 2-inch stem extensions and the following features:
   1. Ball Valves: With extended operating handle of non-thermal-conductive material, and protective sleeve that allows operation of valve without breaking the vapor seal or disturbing insulation.

F. Valve-End Connections:
   1. Flanged: With flanges according to ASME B16.1 for iron valves.
   2. Solder Joint: With sockets according to ASME B16.18.
   3. Threaded: With threads according to ASME B1.20.1.

2.02 BRASS BALL VALVES

A. Two-Piece, Full-Port, Brass Ball Valves with Brass Trim:
   1. Manufacturers: Subject to compliance with requirements, provide product by one of the following:
      a. Crane Co.; Crane Valve Group; Crane Valves.
      b. Crane Co.; Crane Valve Group; Jenkins Valves.
      c. Hammond Valve.
      d. NIBCO INC.
      e. Red-White Valve Corporation.
      f. Approved equal.
   2. Description:
      a. Standard: MSS SP-110.
      b. SWP Rating: 150 psig.
      c. CWP Rating: 600 psig.
      d. Body Design: Two piece.
      e. Body Material: Forged brass.
      f. Ends: Threaded.
      g. Seats: PTFE or TFE.
      h. Stem: Brass.
      i. Ball: Chrome-plated brass.
      j. Port: Full.

2.03 BRONZE BALL VALVES

A. Two-Piece, Full-Port, Bronze Ball Valves with Bronze Trim:
   1. Manufacturers: Subject to compliance with requirements, provide product by one of the following:
      a. Conbraco Industries, Inc.; Apollo Valves.
      b. Crane Co.; Crane Valve Group; Crane Valves.
      c. Hammond Valve.
      d. NIBCO INC.
      e. Red-White Valve Corporation.
      f. Approved equal.
   2. Description:
      a. Standard: MSS SP-110.
      b. SWP Rating: 150 psig.
      c. CWP Rating: 600 psig.
      d. Body Design: Two piece.
      e. Body Material: Bronze.
      f. Ends: Threaded.
      g. Seats: PTFE or TFE.
      h. Stem: Bronze.
      i. Ball: Chrome-plated brass.
      j. Port: Full.

PART 3 - EXECUTION

3.01 VALVE INSTALLATION

A. Install valves with unions or flanges at each piece of equipment arranged to allow service, maintenance, and equipment removal without system shutdown.

B. Locate valves for easy access and provide separate support where necessary.

C. Install valves in horizontal piping with stem at or above center of pipe.

D. Install valves in position to allow full stem movement.

3.02 ADJUSTING

A. Adjust or replace valve packing after piping systems have been tested and put into service but before final adjusting and balancing. Replace valves if persistent leaking occurs.

3.03 GENERAL REQUIREMENTS FOR VALVE APPLICATIONS

A. If valve applications are not indicated, use the following:
   1. Shutoff Service: Ball valves.

B. If valves with specified SWP classes or CWP ratings are not available, the same types of valves with higher SWP class or CWP ratings may be substituted.

C. Select valves, except wafer types, with the following end connections:
   1. For Copper Tubing, NPS 2 and Smaller: Threaded ends except where solder-joint valve-end option is indicated in valve schedules below.
   2. For Copper Tubing, NPS 2-1/2 to NPS 4: Flanged ends except where threaded valve-end option is indicated in valve schedules below.

3.04 DOMESTIC, HOT- AND COLD-WATER VALVE SCHEDULE

A. Pipe NPS 2 and Smaller:
   1. Bronze and Brass Valves: May be provided with solder-joint ends instead of threaded ends.
   2. Ball Valves: Two piece, full port, bronze with bronze trim.

END OF SECTION

SECTION 22 0529

HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
1. Metal pipe hangers and supports.
2. Trapeze pipe hangers.
3. Fastener systems.
4. Pipe positioning systems.
5. Equipment supports.

1.02 PERFORMANCE REQUIREMENTS

A. Delegated Design: Design trapeze pipe hangers and equipment supports, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

B. Structural Performance: Hangers and supports for plumbing piping and equipment shall withstand the effects of gravity loads and stresses within limits and under conditions indicated according to ASCE.
1. Design supports for multiple pipes capable of supporting combined weight of supported systems, system contents, and test water.
2. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.
3. Design seismic-restraint hangers and supports for piping and equipment.

1.03 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: Show fabrication and installation details and include calculations for the following; include Product Data for components:
1. Trapeze pipe hangers.
2. Equipment supports.

C. Delegated-Design Submittal: For trapeze hangers indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.04 INFORMATIONAL SUBMITTALS

A. Welding certificates.

1.05 QUALITY ASSURANCE

A. Structural Steel Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

B. Pipe Welding Qualifications: Qualify procedures and operators according to ASME Boiler and Pressure Vessel Code.

PART 2 - PRODUCTS

2.01 METAL PIPE HANGERS AND SUPPORTS

A. Carbon-Steel Pipe Hangers and Supports:
   1. Description: MSS SP-58, Types 1 through 58, factory-fabricated components.
   2. Galvanized Metallic Coatings: Pre-galvanized or hot dipped.
   3. Nonmetallic Coatings: Plastic coating, jacket, or liner.
   4. Padded Hangers: Hanger with fiberglass or other pipe insulation pad or cushion to support bearing surface of piping.
   5. Hanger Rods: Continuous-thread rod, nuts, and washer made of carbon steel.

B. Stainless-Steel Pipe Hangers and Supports:
   1. Description: MSS SP-58, Types 1 through 58, factory-fabricated components.
   2. Padded Hangers: Hanger with fiberglass or other pipe insulation pad or cushion to support bearing surface of piping.
   3. Hanger Rods: Continuous-thread rod, nuts, and washer made of stainless steel.

C. Copper Pipe Hangers:
   1. Description: MSS SP-58, Types 1 through 58, copper-coated-steel, factory-fabricated components.
   2. Hanger Rods: Continuous-thread rod, nuts, and washer made of copper-coated steel.

2.02 TRAPEZE PIPE HANGERS

A. Description: MSS SP-69, Type 59, shop- or field-fabricated pipe-support assembly made from structural carbon-steel shapes with MSS SP-58 carbon-steel hanger rods, nuts, saddles, and U-bolts.

2.03 FASTENER SYSTEMS

A. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

B. Mechanical-Expansion Anchors: Insert-wedge-type, zinc-coated steel anchors, for use in hardened portland cement concrete; with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

2.04 PIPE POSITIONING SYSTEMS

A. Description: IAPMO PS 42, positioning system of metal brackets, clips, and straps for positioning piping in pipe spaces; for plumbing fixtures in commercial applications.

2.05 EQUIPMENT SUPPORTS

A. Description: Welded, shop- or field-fabricated equipment support made from structural carbon-steel shapes.

2.06 MISCELLANEOUS MATERIALS

A. Structural Steel: ASTM A 36/A 36M, carbon-steel plates, shapes, and bars; black and galvanized.

B. Grout: ASTM C 1107, factory-mixed and -packaged, dry, hydraulic-cement, non-shrink and nonmetallic grout; suitable for interior and exterior applications.
   1. Properties: Non-staining, noncorrosive, and nongaseous.
   2. Design Mix: 5000-psi, 28-day compressive strength.

PART 3 - EXECUTION

3.01 HANGER AND SUPPORT INSTALLATION

A. Metal Pipe-Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Install hangers, supports, clamps, and attachments as required to properly support piping from the building structure.

B. Metal Trapeze Pipe-Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Arrange for grouping of parallel runs of horizontal piping, and support together on field-fabricated trapeze pipe hangers.
   1. Pipes of Various Sizes: Support together and space trapezes for smallest pipe size or install intermediate supports for smaller diameter pipes as specified for individual pipe hangers.
   2. Field fabricate from ASTM A 36/A 36M, carbon-steel shapes selected for loads being supported. Weld steel according to AWS D1.1/D1.1M.

C. Fastener System Installation:
   1. Install powder-actuated fasteners for use in lightweight concrete or concrete slabs less than 4 inches thick in concrete after concrete is placed and completely cured. Use operators that are licensed by powder-actuated tool manufacturer. Install fasteners according to powder-actuated tool manufacturer's operating manual.
   2. Install mechanical-expansion anchors in concrete after concrete is placed and completely cured. Install fasteners according to manufacturer's written instructions.

D. Pipe Positioning-System Installation: Install support devices to make rigid supply and waste piping connections to each plumbing fixture.

E. Install hangers and supports complete with necessary attachments, inserts, bolts, rods, nuts, washers, and other accessories.

F. Equipment Support Installation: Fabricate from welded-structural-steel shapes.

G. Install hangers and supports to allow controlled thermal and seismic movement of piping systems, to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends, and similar units.

H. Install lateral bracing with pipe hangers and supports to prevent swaying.

I. Install building attachments within concrete slabs or attach to structural steel. Install additional attachments at concentrated loads, including valves, flanges, and strainers, 2-1/2 in and larger and at changes in direction of piping. Install concrete inserts before concrete is placed; fasten inserts to forms and install reinforcing bars through openings at top of inserts.

J. Load Distribution: Install hangers and supports so that piping live and dead loads and stresses from movement will not be transmitted to connected equipment.

K. Pipe Slopes: Install hangers and supports to provide indicated pipe slopes and to not exceed maximum pipe deflections allowed by ASME B31.9 for building services piping.

L. Insulated Piping:
1. Attach clamps and spacers to piping.
    a. Piping Operating above Ambient Air Temperature: Clamp may project through insulation.
    b. Do not exceed pipe stress limits allowed by ASME B31.9 for building services piping.

3.02 EQUIPMENT SUPPORTS

A. Fabricate structural-steel stands to suspend equipment from structure overhead or to support equipment above floor.

B. Grouting: Place grout under supports for equipment and make bearing surface smooth.

C. Provide lateral bracing, to prevent swaying, for equipment supports.

3.03 METAL FABRICATIONS

A. Cut, drill, and fit miscellaneous metal fabrications for trapeze pipe hangers and equipment supports.

B. Fit exposed connections together to form hairline joints. Field weld connections that cannot be shop welded because of shipping size limitations.

C. Field Welding: Comply with AWS D1.1/D1.1M procedures for shielded, metal arc welding; appearance and quality of welds; and methods used in correcting welding work; and with the following:
1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. Finish welds at exposed connections so no roughness shows after finishing and so contours of welded surfaces match adjacent contours.

3.04 ADJUSTING

A. Hanger Adjustments: Adjust hangers to distribute loads equally on attachments and to achieve indicated slope of pipe.

B. Trim excess length of continuous-thread hanger and support rods to 1-1/2 inches.

3.05 PAINTING

A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.
1. Apply paint by brush or spray to provide a minimum dry film thickness of 2.0 mils.

B. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

3.06 HANGER AND SUPPORT SCHEDULE

A. Specific hanger and support requirements are in Sections specifying piping systems and equipment.

B. Comply with MSS SP-69 for pipe-hanger selections and applications that are not specified in piping system Sections.

C. Use hangers and supports with galvanized metallic coatings for piping and equipment that will not have field-applied finish.

D. Use nonmetallic coatings on attachments for electrolytic protection where attachments are in direct contact with copper tubing.

E. Use carbon-steel pipe hangers and supports and metal trapeze pipe hangers and attachments for general service applications.

F. Use stainless-steel pipe hangers and stainless-steel attachments for hostile environment applications.

G. Use copper-plated pipe hangers and stainless-steel attachments for copper piping and tubing.

H. Use padded hangers for piping that is subject to scratching.

I. Horizontal-Piping Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
   1. Adjustable, Steel Clevis Hangers (MSS Type 1): For suspension of non-insulated or insulated, stationary pipes ½ in to 30 in.
   2. Yoke-Type Pipe Clamps (MSS Type 2): For suspension of up to 1050 deg F, pipes 4 in to 24 in, requiring up to 4 inches of insulation.
   3. Carbon- or Alloy-Steel, Double-Bolt Pipe Clamps (MSS Type 3): For suspension of pipes ¾ in to 36 in, requiring clamp flexibility and up to 4 inches of insulation.
   4. Adjustable, Steel Band Hangers (MSS Type 7): For suspension of non-insulated, stationary pipes ½ in to 8 in.
   5. U-Bolts (MSS Type 24): For support of heavy pipes ½ in to 30 in.
   6. Pipe Saddle Supports (MSS Type 36): For support of pipes 4 in to 36 in, with steel-pipe base stanchion support and cast-iron floor flange or carbon-steel plate.
   7. Pipe Stanchion Saddles (MSS Type 37): For support of pipes 4 in to 36 in, with steel-pipe base stanchion support and cast-iron floor flange or carbon-steel plate, and with U-bolt to retain pipe.
   8. Single-Pipe Rolls (MSS Type 41): For suspension of pipes 1 in to 30 in, from two rods if longitudinal movement caused by expansion and contraction might occur.
   9. Complete Pipe Rolls (MSS Type 44): For support of pipes 2 in to 42 in if longitudinal movement caused by expansion and contraction might occur but vertical adjustment is not necessary.

J. Vertical-Piping Clamps: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
   1. Extension Pipe or Riser Clamps (MSS Type 8): For support of pipe risers ¾ in to 24 in.
   2. Carbon- or Alloy-Steel Riser Clamps (MSS Type 42): For support of pipe risers ¾ in to 24 in if longer ends are required for riser clamps.

K. Hanger-Rod Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
   1. Steel Turnbuckles (MSS Type 13): For adjustment up to 6 inches for heavy loads.
   2. Steel Clevises (MSS Type 14): For 120 to 450 deg F piping installations.

L. Building Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
   1. Steel or Malleable Concrete Inserts (MSS Type 18): For upper attachment to suspend pipe hangers from concrete ceiling.
   2. Top-Beam C-Clamps (MSS Type 19): For use under roof installations with bar-joist construction, to attach to top flange of structural shape.
   3. Side-Beam or Channel Clamps (MSS Type 20): For attaching to bottom flange of beams, channels, or angles.
   4. Center-Beam Clamps (MSS Type 21): For attaching to center of bottom flange of beams.
   5. Welded Beam Attachments (MSS Type 22): For attaching to bottom of beams if loads are considerable and rod sizes are large.
   6. C-Clamps (MSS Type 23): For structural shapes.
   7. Welded-Steel Brackets: For support of pipes from below, or for suspending from above by using clip and rod. Use one of the following for indicated loads:
      a. Light (MSS Type 31): 750 lb.
      b. Medium (MSS Type 32): 1500 lb.
      c. Heavy (MSS Type 33): 3000 lb.
   8. Side-Beam Brackets (MSS Type 34): For sides of steel or wooden beams.
   9. Plate Lugs (MSS Type 57): For attaching to steel beams if flexibility at beam is required.

M. Saddles and Shields: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
   1. Steel-Pipe-Covering Protection Saddles (MSS Type 39): To fill interior voids with insulation that matches adjoining insulation.
   2. Protection Shields (MSS Type 40): Of length recommended in writing by manufacturer to prevent crushing insulation.
   3. Thermal-Hanger Shield Inserts: For supporting insulated pipe.

N. Spring Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
   1. Spring Cushions (MSS Type 48): For light loads if vertical movement does not exceed 1-1/4 inches.
   2. Spring-Cushion Roll Hangers (MSS Type 49): For equipping Type 41, roll hanger with springs.
   3. Variable-Spring Base Supports (MSS Type 52): Preset to indicated load and limit variability factor to 25 percent to allow expansion and contraction of piping system from base support.

O. Comply with MSS SP-69 for trapeze pipe-hanger selections and applications that are not specified in piping system Sections.

P. Use powder-actuated fasteners or mechanical-expansion anchors instead of building attachments where required in concrete construction.

Q. Use pipe positioning systems in pipe spaces behind plumbing fixtures to support supply and waste piping for plumbing fixtures.

END OF SECTION

SECTION 22 0553

IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Equipment labels.
   2. Warning signs and labels.
   3. Pipe labels.

1.02 ACTION SUBMITTAL

A. Product Data: For each type of product indicated.

PART 2 - PRODUCTS

2.01 EQUIPMENT LABELS

A. Metal Labels for Equipment:
   1. Material and Thickness: Aluminum, 0.032-inch or anodized aluminum, 0.032-inch minimum thickness, and having predrilled or stamped holes for attachment hardware.
   2. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
   3. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.
   4. Fasteners: Stainless-steel rivets or self-tapping screws.
   5. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.

B. Plastic Labels for Equipment:
   1. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/16 inch thick, and having predrilled holes for attachment hardware.
   2. Letter Color: Black.
   3. Background Color: White.
   4. Maximum Temperature: Able to withstand temperatures up to 160 deg F.
   5. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
   6. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.
   7. Fasteners: Stainless-steel rivets or self-tapping screws.
   8. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.

C. Label Content: Include equipment's Drawing designation or unique equipment number, Drawing numbers where equipment is indicated (plans, details, and schedules), plus the Specification Section number and title where equipment is specified.

D. Equipment Label Schedule: For each item of equipment to be labeled, on 8-1/2-by-11-inch bond paper. Tabulate equipment identification number and identify Drawing numbers where

equipment is indicated (plans, details, and schedules), plus the Specification Section number and title where equipment is specified. Equipment schedule shall be included in operation and maintenance data.

2.02 PIPE LABELS

A. General Requirements for Manufactured Pipe Labels: Preprinted, color-coded, with lettering indicating service, and showing flow direction.

B. Pre-tensioned Pipe Labels: Pre-coiled, semi-rigid plastic formed to partially cover circumference of pipe and to attach to pipe without fasteners or adhesive.

C. Self-Adhesive Pipe Labels: Printed plastic with contact-type, permanent-adhesive backing.

D. Pipe Label Contents: Include identification of piping service using same designations or abbreviations as used on Drawings, pipe size, and an arrow indicating flow direction.
   1. Flow-Direction Arrows: Integral with piping system service lettering to accommodate both directions or as separate unit on each pipe label to indicate flow direction.
   2. Lettering Size: At least 1-1/2 inches high.

PART 3 - EXECUTION

3.01 PREPARATION

A. Clean piping and equipment surfaces of substances that could impair bond of identification devices, including dirt, oil, grease, release agents, and incompatible primers, paints, and encapsulants.

3.02 EQUIPMENT LABEL INSTALLATION

A. Install or permanently fasten labels on each major item of mechanical equipment.

B. Locate equipment labels where accessible and visible.

3.03 PIPE LABEL INSTALLATION

A. Locate pipe labels where piping is exposed or above accessible ceilings in finished spaces; machine rooms; accessible maintenance spaces such as shafts, tunnels, and plenums; and exterior exposed locations as follows:
   1. Near each valve and control device.
   2. Near each branch connection, excluding short takeoffs for fixtures and terminal units. Where flow pattern is not obvious, mark each pipe at branch.
   3. Near penetrations through walls, floors, ceilings, and inaccessible enclosures.
   4. At access doors, manholes, and similar access points that permit view of concealed piping.
   5. Near major equipment items and other points of origination and termination.
   6. Spaced at maximum intervals of 50 feet along each run. Reduce intervals to 20 feet in areas of congested piping and equipment.
   7. On piping above removable acoustical ceilings. Omit intermediately spaced labels.

B. Pipe Label Color Schedule:
   1. Domestic Cold and Hot Water Piping:
      a. Background Color: White.
      b. Letter Color: Black.

END OF SECTION

SECTION 22 0719

PLUMBING PIPING INSULATION

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes insulating the following plumbing piping services:
   1. Domestic hot-water and cold-water piping.
   2. Supplies and drains for handicap-accessible lavatories and sinks.

1.02 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

1.03 INFORMATIONAL SUBMITTALS

A. Field quality-control reports.

1.04 QUALITY ASSURANCE

A. Surface-Burning Characteristics: For insulation and related materials, as determined by testing identical products according to ASTM E 84 by a testing agency acceptable to authorities having jurisdiction. Factory label insulation and jacket materials and adhesive, mastic, tapes, and cement material containers, with appropriate markings of applicable testing agency.
   1. Insulation Installed Indoors: Flame-spread index of 25 or less, and smoke-developed index of 50 or less.

B. Comply with the following applicable standards and other requirements specified for miscellaneous components:
   1. Supply and Drain Protective Shielding Guards: ICC A117.1.

PART 2 - PRODUCTS

2.01 INSULATION MATERIALS

A. Comply with requirements in "Piping Insulation Schedule, General," and "Indoor Piping Insulation Schedule," articles for where insulating materials shall be applied.

B. Products shall not contain asbestos, lead, mercury, or mercury compounds.

C. Products that come in contact with stainless steel shall have a leachable chloride content of less than 50 ppm when tested according to ASTM C 871.

D. Insulation materials for use on austenitic stainless steel shall be qualified as acceptable according to ASTM C 795.

E. Foam insulation materials shall not use CFC or HCFC blowing agents in the manufacturing process.

F. Mineral-Fiber, Preformed Pipe Insulation:

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
   a. Fibrex Insulations Inc.; Coreplus 1200.
   b. Johns Manville; Micro-Lok.
   c. Knauf Insulation; 1000-Degree Pipe Insulation.
   d. Manson Insulation Inc.; Alley-K.
   e. Owens Corning; Fiberglas Pipe Insulation.
2. Type I, 850 Deg F Materials: Mineral or glass fibers bonded with a thermosetting resin. Comply with ASTM C 547, Type I, Grade A, with factory-applied ASJ. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.

2.02 INSULATING CEMENTS

A. Mineral-Fiber, Hydraulic-Setting Insulating and Finishing Cement: Comply with ASTM C 449.
   1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
      a. Ramco Insulation, Inc.; Ramcote 1200 and Quik-Cote.

2.03 ADHESIVES

A. Materials shall be compatible with insulation materials, jackets, and substrates and for bonding insulation to itself and to surfaces to be insulated, unless otherwise indicated.

B. Mineral-Fiber Adhesive: Comply with MIL-A-3316C, Class 2, Grade A.
   1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
      a. Childers Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; CP-127.
      b. Eagle Bridges - Marathon Industries; 225.
      c. Foster Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; 85-60/85-70.
      d. Mon-Eco Industries, Inc.; 22-25.
      e. One or both subparagraphs below may be required to comply with Project requirements or authorities having jurisdiction.
   2. For indoor applications, adhesive shall have a VOC content of 80 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
   3. Adhesive shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.04 FACTORY-APPLIED JACKETS

A. Insulation system schedules indicate factory-applied jackets on various applications. When factory-applied jackets are indicated, comply with the following:
   1. ASJ: White, kraft-paper, fiberglass-reinforced scrim with aluminum-foil backing; complying with ASTM C 1136, Type I.

2.05 TAPES

A. ASJ Tape: White vapor-retarder tape matching factory-applied jacket with acrylic adhesive, complying with ASTM C 1136.
   1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
      a. ABI, Ideal Tape Division; 428 AWF ASJ.
      b. Avery Dennison Corporation, Specialty Tapes Division; Fasson 0836.

c. Compac Corporation; 104 and 105.
d. Venture Tape; 1540 CW Plus, 1542 CW Plus, and 1542 CW Plus/SQ.

2. Width: 3 inches
3. Thickness: 11.5 mils
4. Adhesion: 90 ounces force/inch.
5. Elongation: 2 percent.
6. Tensile Strength: 40 lbf/inch in width.
7. ASJ Tape Disks and Squares: Precut disks or squares of ASJ tape.

PART 3 - EXECUTION

3.01 PREPARATION

A. Surface Preparation: Clean and dry surfaces to receive insulation. Remove materials that will adversely affect insulation application.

B. Mix insulating cements with clean potable water; if insulating cements are to be in contact with stainless-steel surfaces, use de-mineralized water.

3.02 GENERAL INSTALLATION REQUIREMENTS

A. Install insulation materials, accessories, and finishes with smooth, straight, and even surfaces; free of voids throughout the length of piping including fittings, valves, and specialties.

B. Install insulation materials, forms, vapor barriers or retarders, jackets, and thicknesses required for each item of pipe system as specified in insulation system schedules.

C. Install accessories compatible with insulation materials and suitable for the service. Install accessories that do not corrode, soften, or otherwise attack insulation or jacket in either wet or dry state.

D. Install insulation with longitudinal seams at top and bottom of horizontal runs.

E. Install multiple layers of insulation with longitudinal and end seams staggered.

F. Do not weld brackets, clips, or other attachment devices to piping, fittings, and specialties.

G. Keep insulation materials dry during application and finishing.

H. Install insulation with tight longitudinal seams and end joints. Bond seams and joints with adhesive recommended by insulation material manufacturer.

I. Install insulation with least number of joints practical.

J. Where vapor barrier is indicated, seal joints, seams, and penetrations in insulation at hangers, supports, anchors, and other projections with vapor-barrier mastic.
   1. Install insulation continuously through hangers and around anchor attachments.
   2. For insulation application where vapor barriers are indicated, extend insulation on anchor legs from point of attachment to supported item to point of attachment to structure. Taper and seal ends at attachment to structure with vapor-barrier mastic.
   3. Install insert materials and install insulation to tightly join the insert. Seal insulation to insulation inserts with adhesive or sealing compound recommended by insulation material manufacturer.

4. Cover inserts with jacket material matching adjacent pipe insulation. Install shields over jacket, arranged to protect jacket from tear or puncture by hanger, support, and shield.

K. Apply adhesives, mastics, and sealants at manufacturer's recommended coverage rate and wet and dry film thicknesses.

L. Install insulation with factory-applied jackets as follows:
1. Draw jacket tight and smooth.
2. Cover circumferential joints with 3-inch-wide strips, of same material as insulation jacket. Secure strips with adhesive and outward clinching staples along both edges of strip, spaced 4 inches o.c.
3. Overlap jacket longitudinal seams at least 1-1/2 inches. Install insulation with longitudinal seams at bottom of pipe. Clean and dry surface to receive self-sealing lap. Staple laps with outward clinching staples along edge at 4 inches o.c.
   a. For below-ambient services, apply vapor-barrier mastic over staples.
4. Cover joints and seams with tape, according to insulation material manufacturer's written instructions, to maintain vapor seal.
5. Where vapor barriers are indicated, apply vapor-barrier mastic on seams and joints and at ends adjacent to pipe flanges and fittings.

M. Cut insulation in a manner to avoid compressing insulation more than 75 percent of its nominal thickness.

N. Finish installation with systems at operating conditions. Repair joint separations and cracking due to thermal movement.

O. Repair damaged insulation facings by applying same facing material over damaged areas. Extend patches at least 4 inches beyond damaged areas. Adhere, staple, and seal patches similar to butt joints.

P. For above-ambient services, do not install insulation to the following:
1. Vibration-control devices.
2. Testing agency labels and stamps.
3. Nameplates and data plates.
4. Cleanouts.

3.03 PENETRATIONS

A. Insulation Installation at Interior Wall and Partition Penetrations (That Are Not Fire Rated): Install insulation continuously through walls and partitions.

B. Insulation Installation at Floor Penetrations:
1. Pipe: Install insulation continuously through floor penetrations.
2. Seal penetrations through fire-rated assemblies.

3.04 GENERAL PIPE INSULATION INSTALLATION

A. Requirements in this article generally apply to all insulation materials except where more specific requirements are specified in various pipe insulation material installation articles.

B. Insulation Installation on Fittings, Valves, Strainers, Flanges, and Unions:
1. Install insulation over fittings, valves, strainers, flanges, unions, and other specialties with continuous thermal and vapor-retarder integrity unless otherwise indicated.
2. Insulate pipe elbows using preformed fitting insulation or mitered fittings made from same material and density as adjacent pipe insulation. Each piece shall be butted tightly

against adjoining piece and bonded with adhesive. Fill joints, seams, voids, and irregular surfaces with insulating cement finished to a smooth, hard, and uniform contour that is uniform with adjoining pipe insulation.

3. Insulate tee fittings with preformed fitting insulation or sectional pipe insulation of same material and thickness as used for adjacent pipe. Cut sectional pipe insulation to fit. Butt each section closely to the next and hold in place with tie wire. Bond pieces with adhesive.
4. Insulate valves using preformed fitting insulation or sectional pipe insulation of same material, density, and thickness as used for adjacent pipe. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker. For valves, insulate up to and including the bonnets, valve stuffing-box studs, bolts, and nuts. Fill joints, seams, and irregular surfaces with insulating cement.
5. Insulate flanges and unions using a section of oversized preformed pipe insulation. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker.
6. Cover segmented insulated surfaces with a layer of finishing cement and coat with a mastic. Install vapor-barrier mastic for below-ambient services and a breather mastic for above-ambient services. Reinforce the mastic with fabric-reinforcing mesh. Trowel the mastic to a smooth and well-shaped contour.

3.05 INSTALLATION OF MINERAL-FIBER PREFORMED PIPE INSULATION

A. Insulation Installation on Straight Pipes and Tubes:
   1. Secure each layer of preformed pipe insulation to pipe with wire or bands and tighten bands without deforming insulation materials.
   2. Where vapor barriers are indicated, seal longitudinal seams, end joints, and protrusions with vapor-barrier mastic and joint sealant.
   3. For insulation with factory-applied jackets on above-ambient surfaces, secure laps with outward clinched staples at 6 inches o.c.
   4. For insulation with factory-applied jackets on below-ambient surfaces, do not staple longitudinal tabs. Instead, secure tabs with additional adhesive as recommended by insulation material manufacturer and seal with vapor-barrier mastic and flashing sealant.

B. Insulation Installation on Pipe Fittings and Elbows:
   1. Install preformed sections of same material as straight segments of pipe insulation when available.
   2. When preformed insulation elbows and fittings are not available, install mitered sections of pipe insulation, to a thickness equal to adjoining pipe insulation. Secure insulation materials with wire or bands.

C. Insulation Installation on Valves and Pipe Specialties:
   1. Install preformed sections of same material as straight segments of pipe insulation when available.
   2. When preformed sections are not available, install mitered sections of pipe insulation to valve body.
   3. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.
   4. Install insulation to flanges as specified for flange insulation application.

3.06 FIELD QUALITY CONTROL

A. Perform tests and inspections.

B. Tests and Inspections:

1. Inspect pipe, fittings, strainers, and valves, randomly selected by Architect, by removing field-applied jacket and insulation in layers in reverse order of their installation.

C. All insulation applications will be considered defective Work if sample inspection reveals noncompliance with requirements.

3.07 PIPING INSULATION SCHEDULE, GENERAL

A. Acceptable preformed pipe and tubular insulation materials and thicknesses are identified for each piping system and pipe size range. If more than one material is listed for a piping system, selection from materials listed is Contractor's option.

3.08 INDOOR PIPING INSULATION SCHEDULE

A. Domestic Hot and Re-circulated Hot Water: Insulation shall be the following:
1. Mineral-Fiber, Preformed Pipe Insulation, Type I: 1 inch thick.

B. Exposed Sanitary Drains, Domestic Water, Domestic Hot Water, and Stops for Plumbing Fixtures for People with Disabilities: Insulation shall be the following:
1. Molded Vinyl: Truebro Lav Guard , white

END OF SECTION

SECTION 22 1116

DOMESTIC WATER PIPING

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes aboveground domestic water pipes, tubes, and fittings inside buildings.

1.02 ACTION SUBMITTALS

A. Product Data: For transition fittings and dielectric fittings.

1.03 INFORMATIONAL SUBMITTALS

A. System purging and disinfecting activities report.

B. Field quality-control reports.

PART 2 - PRODUCTS

2.01 PIPING MATERIALS

A. Comply with requirements in "Piping Schedule" Article for applications of pipe, tube, fitting materials, and joining methods for specific services, service locations, and pipe sizes.

B. Potable-water piping and components shall comply with NSF 14 and NSF 61. Plastic piping components shall be marked with "NSF-pw."

2.02 COPPER TUBE AND FITTINGS

A. Hard Copper Tube: ASTM B 88, Type L water tube, drawn temper.

B. Cast-Copper, Solder-Joint Fittings: ASME B16.18, pressure fittings.

C. Wrought-Copper, Solder-Joint Fittings: ASME B16.22, wrought-copper pressure fittings.

D. Bronze Flanges: ASME B16.24, Class 150, with solder-joint ends.

E. Copper Unions:

1. MSS SP-123.
2. Cast-copper-alloy, hexagonal-stock body.
3. Ball-and-socket, metal-to-metal seating surfaces.
4. Solder-joint or threaded ends.

2.03 PIPING JOINING MATERIALS

A. Solder Filler Metals: ASTM B 32, lead-free alloys.

B. Flux: ASTM B 813, water flushable.

C. Brazing Filler Metals: AWS A5.8/A5.8M, BCuP Series, copper-phosphorus alloys for general-duty brazing unless otherwise indicated.

2.04 TRANSITION FITTINGS

A. General Requirements:
   1. Same size as pipes to be joined.
   2. Pressure rating at least equal to pipes to be joined.
   3. End connections compatible with pipes to be joined.

B. Fitting-Type Transition Couplings: Manufactured piping coupling or specified piping system fitting.

2.05 DIELECTRIC FITTINGS

A. General Requirements: Assembly of copper alloy and ferrous materials with separating nonconductive insulating material. Include end connections compatible with pipes to be joined.

B. Dielectric Unions:
   1. Standard: ASSE 1079.
   2. Pressure Rating: 125 psig minimum at 180 deg F.
   3. End Connections: Solder-joint copper alloy and threaded ferrous.

PART 3 - EXECUTION

3.01 PIPING INSTALLATION

A. Drawing plans, schematics, and diagrams indicate general location and arrangement of domestic water piping. Indicated locations and arrangements are used to size pipe and calculate friction loss, expansion, and other design considerations. Install piping as indicated unless deviations to layout are approved on coordination drawings.

B. Install domestic water piping level and plumb.

C. Install seismic restraints on piping.

D. Install piping concealed from view and protected from physical contact by building occupants unless otherwise indicated and except in equipment rooms and service areas.

E. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.

F. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal, and coordinate with other services occupying that space.

G. Install piping to permit valve servicing.

H. Install nipples, unions, special fittings, and valves with pressure ratings the same as or higher than the system pressure rating used in applications below unless otherwise indicated.

I. Install piping free of sags and bends.

J. Install fittings for changes in direction and branch connections.

K. Install unions in copper tubing at final connection to each piece of equipment, machine, and specialty.

L. Install sleeves for piping penetrations of walls, ceilings, and floors.

M. Install sleeve seals for piping penetrations of concrete walls and slabs.

N. Install escutcheons for piping penetrations of walls, ceilings, and floors. Comply with requirements for escutcheons specified in Division 22 Section "Escutcheons for Plumbing Piping."

3.02 JOINT CONSTRUCTION

A. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.

B. Remove scale, slag, dirt, and debris from inside and outside of pipes, tubes, and fittings before assembly.

C. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
   1. Apply appropriate tape or thread compound to external pipe threads.
   2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged.

D. Brazed Joints for Copper Tubing: Comply with CDA's "Copper Tube Handbook," "Brazed Joints" chapter.

E. Soldered Joints for Copper Tubing: Apply ASTM B 813, water-flushable flux to end of tube. Join copper tube and fittings according to ASTM B 828 or CDA's "Copper Tube Handbook."

F. Joints for Dissimilar-Material Piping: Make joints using adapters compatible with materials of both piping systems.

3.03 DIELECTRIC FITTING INSTALLATION

A. Install dielectric fittings in piping at connections of dissimilar metal piping and tubing.

B. Dielectric Fittings for NPS 2 and Smaller: Use dielectric couplings.

3.04 HANGER AND SUPPORT INSTALLATION

A. Vertical Piping: MSS Type 8 or 42, clamps

B. Support vertical piping and tubing at base and at each floor.

C. Install supports for vertical copper tubing.

D. Install supports for vertical steel piping.

3.05 CONNECTIONS

A. Drawings indicate general arrangement of piping, fittings, and specialties.

B. When installing piping adjacent to equipment and machines, allow space for service and maintenance.

C. Connect domestic water piping to exterior water-service piping. Use transition fitting to join dissimilar piping materials.

D. Connect domestic water piping to water-service piping with shutoff valve; extend and connect to the following:
   1. Water Heaters: Cold-water inlet and hot-water outlet piping in sizes indicated, but not smaller than sizes of water heater connections.
   2. Plumbing Fixtures: Cold- and hot-water-supply piping in sizes indicated, but not smaller than that required by plumbing code. Comply with requirements for connection sizes in Division 22 plumbing fixture Sections.

3.06 IDENTIFICATION

A. Identify system components.

B. Label pressure piping with system operating pressure.

3.07 FIELD QUALITY CONTROL

A. Perform the following tests and inspections:
   1. Piping Inspections:
      a. Do not enclose, cover, or put piping into operation until it has been inspected and approved by authorities having jurisdiction.
      b. During installation, notify authorities having jurisdiction at least one day before inspection must be made. Perform tests specified below in presence of authorities having jurisdiction:
         1) Roughing-in Inspection: Arrange for inspection of piping before concealing or closing in after roughing in and before setting fixtures.
         2) Final Inspection: Arrange for authorities having jurisdiction to observe tests specified in "Piping Tests" Subparagraph below and to ensure compliance with requirements.
      c. Re-inspection: If authorities having jurisdiction find that piping will not pass tests or inspections, make required corrections and arrange for re-inspection.
      d. Reports: Prepare inspection reports and have them signed by authorities having jurisdiction.
   2. Piping Tests:
      a. Fill domestic water piping. Check components to determine that they are not air bound and that piping is full of water.
      b. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired. If testing is performed in segments, submit a separate report for each test, complete with diagram of portion of piping tested.
      c. Leave new, altered, extended, or replaced domestic water piping uncovered and unconcealed until it has been tested and approved. Expose work that was covered or concealed before it was tested.
      d. Cap and subject piping to static water pressure of 50 psig above operating pressure, without exceeding pressure rating of piping system materials. Isolate test source and allow it to stand for four hours. Leaks and loss in test pressure constitute defects that must be repaired.
      e. Repair leaks and defects with new materials, and retest piping or portion thereof until satisfactory results are obtained.
      f. Prepare reports for tests and for corrective action required.

B. Domestic water piping will be considered defective if it does not pass tests and inspections.

C. Prepare test and inspection reports.

3.08 ADJUSTING

A. Perform the following adjustments before operation:
   1. Close drain valves, hydrants, and hose bibbs.
   2. Open shutoff valves to fully open position.
   3. Open throttling valves to proper setting.
   4. Adjust balancing valves in hot-water-circulation return piping to provide adequate flow.
      a. Manually adjust ball-type balancing valves in hot-water-circulation return piping to provide hot-water flow in each branch.
      b. Adjust calibrated balancing valves to flows indicated.
   5. Remove plugs used during testing of piping and for temporary sealing of piping during installation.
   6. Remove and clean strainer screens. Close drain valves and replace drain plugs.
   7. Remove filter cartridges from housings and verify that cartridges are as specified for application where used and are clean and ready for use.
   8. Check plumbing specialties and verify proper settings, adjustments, and operation.

3.09 CLEANING

A. Clean and disinfect potable domestic water piping as follows:
   1. Purge new piping and parts of existing piping that have been altered, extended, or repaired before using.
   2. Use purging and disinfecting procedures prescribed by authorities having jurisdiction; if methods are not prescribed, use procedures described in either AWWA C651 or AWWA C652 or follow procedures described below:
      a. Flush piping system with clean, potable water until dirty water does not appear at outlets.
      b. Fill and isolate system according to either of the following:
         1) Fill system or part thereof with water/chlorine solution with at least 50 ppm of chlorine. Isolate with valves and allow to stand for 24 hours.
         2) Fill system or part thereof with water/chlorine solution with at least 200 ppm of chlorine. Isolate and allow to stand for three hours.
      c. Flush system with clean, potable water until no chlorine is in water coming from system after the standing time.
      d. Repeat procedures if biological examination shows contamination.
      e. Submit water samples in sterile bottles to authorities having jurisdiction.

B. Prepare and submit reports of purging and disinfecting activities. Include copies of water-sample approvals from authorities having jurisdiction.

C. Clean interior of domestic water piping system. Remove dirt and debris as work progresses.

3.10 PIPING SCHEDULE

A. Transition and special fittings with pressure ratings at least equal to piping rating may be used in applications below unless otherwise indicated.

B. Flanges and unions may be used for aboveground piping joints unless otherwise indicated.

C. Fitting Option: Extruded-tee connections and brazed joints may be used on aboveground copper tubing.

D. Aboveground domestic water piping, NPS 2 and smaller , shall be the following:
   1. Hard copper tube, ASTM B 88, Type L; cast or wrought-copper, solder-joint fittings; and brazed or soldered joints.

E. Aboveground domestic water piping, NPS 2-1/2 to NPS 4, shall be the following:
   1. Hard copper tube, ASTM B 88, Type L; cast or wrought-copper, solder-joint fittings; and brazed or soldered joints.

END OF SECTION

SECTION 22 1119

DOMESTIC WATER PIPING SPECIALTIES

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Hose bibbs.

1.02 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.03 INFORMATIONAL SUBMITTALS

A. Field quality-control reports.

1.04 CLOSEOUT SUBMITTALS

A. Operation and maintenance data.

PART 2 - PRODUCTS

2.01 GENERAL REQUIREMENTS FOR PIPING SPECIALTIES

A. Potable-water piping and components shall comply with NSF 61.

2.02 PERFORMANCE REQUIREMENTS

A. Minimum Working Pressure for Domestic Water Piping Specialties: 125 psig unless otherwise indicated.

2.03 HOSE BIBBS

A. Hose Bibbs:

1. Standard: ASME A112.18.1 for sediment faucets.
2. Body Material: Bronze.
3. Seat: Bronze, replaceable.
4. Supply Connections: NPS 3/4 threaded or solder-joint inlet.
5. Outlet Connection: Garden-hose thread complying with ASME B1.20.7.
6. Pressure Rating: 125 psig.
7. Vacuum Breaker: Integral non-removable, drainable, hose-connection vacuum breaker complying with ASSE 1011.
8. Finish for Equipment Rooms: Rough bronze, or chrome or nickel plated.
9. Finish for Service Areas: Chrome or nickel plated.
10. Finish for Finished Rooms: Chrome or nickel plated.
11. Operation for Equipment Rooms: Wheel handle or operating key.
12. Operation for Service Areas: Operating key.
13. Operation for Finished Rooms: Operating key.

14. Include operating key with each operating-key hose bibb.
15. Include wall flange with each chrome- or nickel-plated hose bibb.

PART 3 - EXECUTION

3.01 CONNECTIONS

A. Comply with requirements for piping specified in other Division 22 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.

3.02 FIELD QUALITY CONTROL

A. Domestic water piping specialties will be considered defective if they do not pass tests and inspections.

B. Prepare test and inspection reports.

END OF SECTION

SECTION 22 1316

SANITARY WASTE AND VENT PIPING

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Pipe, tube, and fittings.
   2. Specialty pipe fittings.

1.02 PERFORMANCE REQUIREMENTS

A. Seismic Performance: Soil, waste, and vent piping and support and installation shall withstand the effects of earthquake motions.

1.03 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

1.04 INFORMATIONAL SUBMITTALS

A. Seismic Qualification Certificates: For waste and vent piping, accessories, and components, from manufacturer.
   1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
   2. Detailed description of piping anchorage devices on which the certification is based and their installation requirements.

1.05 QUALITY ASSURANCE

A. Piping materials shall bear label, stamp, or other markings of specified testing agency.

PART 2 - PRODUCTS

2.01 PIPING MATERIALS

A. Comply with requirements in "Piping Schedule" Article for applications of pipe, tube, fitting materials, and joining methods for specific services, service locations, and pipe sizes.

2.02 HUBLESS, CAST-IRON SOIL PIPE AND FITTINGS

A. Pipe and Fittings: ASTM A 888 or CISPI 301.

B. CISPI, Hubless-Piping Couplings:
   1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
      a. ANACO-Husky.
      b. Dallas Specialty & Mfg. Co.
      c. Fernco Inc.

d. Matco-Norca, Inc.
e. MIFAB, Inc.
f. Mission Rubber Company; a division of MCP Industries, Inc.
g. Stant.
h. Tyler Pipe.

2. Standards: ASTM C 1277 and CISPI 310.
3. Description: Stainless-steel corrugated shield with stainless-steel bands and tightening devices; and ASTM C 564, rubber sleeve with integral, center pipe stop.

C. Heavy-Duty, Hubless-Piping Couplings:
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
a. ANACO-Husky.
b. Clamp-All Corp.
c. Dallas Specialty & Mfg. Co.
d. MIFAB, Inc.
e. Mission Rubber Company; a division of MCP Industries, Inc.
f. Stant.
g. Tyler Pipe.

2. Standards: ASTM C 1277 and ASTM C 1540.
3. Description: Stainless-steel shield with stainless-steel bands and tightening devices; and ASTM C 564, rubber sleeve with integral, center pipe stop.

2.03 SPECIALTY PIPE FITTINGS

A. Transition Couplings:
1. General Requirements: Fitting or device for joining piping with small differences in OD's or of different materials. Include end connections same size as and compatible with pipes to be joined.
2. Fitting-Type Transition Couplings: Manufactured piping coupling or specified piping system fitting.
3. Unshielded, Non-pressure Transition Couplings:
a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1) Dallas Specialty & Mfg. Co.
2) Fernco Inc.
3) Mission Rubber Company; a division of MCP Industries, Inc.
4) Plastic Oddities; a division of Diverse Corporate Technologies, Inc.
b. Standard: ASTM C 1173.
c. Description: Elastomeric, sleeve-type, reducing or transition pattern. Include shear ring and corrosion-resistant-metal tension band and tightening mechanism on each end.
d. Sleeve Materials:
1) For Cast-Iron Soil Pipes: ASTM C 564, rubber.
2) For Dissimilar Pipes: ASTM D 5926, PVC or other material compatible with pipe materials being joined.
4. Shielded, Non-pressure Transition Couplings:
a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1) Cascade Waterworks Mfg. Co.
2) Mission Rubber Company; a division of MCP Industries, Inc.
b. Standard: ASTM C 1460.

c. Description: Elastomeric or rubber sleeve with full-length, corrosion-resistant outer shield and corrosion-resistant-metal tension band and tightening mechanism on each end.

PART 3 - EXECUTION

3.01 PIPING INSTALLATION

A. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated unless deviations to layout are approved on coordination drawings.

B. Install piping in concealed locations unless otherwise indicated and except in equipment rooms and service areas.

C. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.

D. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.

E. Install piping at indicated slopes.

F. Install piping free of sags and bends.

G. Install fittings for changes in direction and branch connections.

H. Install seismic restraints on piping.

I. Make changes in direction for soil and waste drainage and vent piping using appropriate branches, bends, and long-sweep bends. Sanitary tees and short-sweep 1/4 bends may be used on vertical stacks if change in direction of flow is from horizontal to vertical. Use long-turn, double Y-branch and 1/8-bend fittings if two fixtures are installed back to back or side by side with common drain pipe. Straight tees, elbows, and crosses may be used on vent lines. Do not change direction of flow more than 90 degrees. Use proper size of standard increasers and reducers if pipes of different sizes are connected. Reducing size of drainage piping in direction of flow is prohibited.

J. Install soil and waste drainage and vent piping at the following minimum slopes unless otherwise indicated:
   1. Horizontal Sanitary Drainage Piping: 2 percent downward in direction of flow.
   2. Vent Piping: 1 percent down toward vertical fixture vent or toward vent stack.

K. Install cast-iron soil piping according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook," Chapter IV, "Installation of Cast Iron Soil Pipe and Fittings."

L. Install aboveground copper tubing according to CDA's "Copper Tube Handbook."

M. Plumbing Specialties:
   1. Install backwater valves in sanitary waste gravity-flow piping.
   2. Install cleanouts at grade and extend to where building sanitary drains connect to building sanitary sewers in sanitary drainage gravity-flow piping.
   3. Install drains in sanitary drainage gravity-flow piping.

N. Do not enclose, cover, or put piping into operation until it is inspected and approved by authorities having jurisdiction.

O. Install sleeves for piping penetrations of walls, ceilings, and floors.

P. Install sleeve seals for piping penetrations of concrete walls and slabs.

Q. Install escutcheons for piping penetrations of walls, ceilings, and floors. Comply with requirements for escutcheons specified in Division 22 Section "Escutcheons for Plumbing Piping."

3.02 JOINT CONSTRUCTION

A. Join hub-and-spigot, cast-iron soil piping with gasket joints according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for compression joints.

B. Join hubless, cast-iron soil piping according to CISPI 310 and CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for hubless-piping coupling joints.

3.03 SPECIALTY PIPE FITTING INSTALLATION

A. Transition Couplings:
1. Install transition couplings at joints of piping with small differences in OD's.
2. In Drainage Piping: Shielded, non-pressure transition couplings.

3.04 HANGER AND SUPPORT INSTALLATION

A. Support horizontal piping and tubing within 12 inches of each fitting and coupling.

B. Support vertical piping and tubing at base and at each floor.

C. Rod diameter may be reduced one size for double-rod hangers, with 3/8-inch minimum rods.

D. Support piping and tubing not listed above according to MSS SP-69 and manufacturer's written instructions.

3.05 CONNECTIONS

A. Drawings indicate general arrangement of piping, fittings, and specialties.

B. Connect drainage and vent piping to the following:
1. Plumbing Fixtures: Connect drainage piping in sizes indicated, but not smaller than required by plumbing code.
2. Plumbing Fixtures and Equipment: Connect atmospheric vent piping in sizes indicated, but not smaller than required by authorities having jurisdiction.
3. Plumbing Specialties: Connect drainage and vent piping in sizes indicated, but not smaller than required by plumbing code.
4. Install test tees (wall cleanouts) in conductors near floor and floor cleanouts with cover flush with floor.

3.06 IDENTIFICATION

A. Identify exposed sanitary waste and vent piping.

3.07 FIELD QUALITY CONTROL

A. During installation, notify authorities having jurisdiction at least 24 hours before inspection must be made. Perform tests specified below in presence of authorities having jurisdiction.
   1. Roughing-in Inspection: Arrange for inspection of piping before concealing or closing-in after roughing-in and before setting fixtures.
   2. Final Inspection: Arrange for final inspection by authorities having jurisdiction to observe tests specified below and to ensure compliance with requirements.

B. Re-inspection: If authorities having jurisdiction find that piping will not pass test or inspection, make required corrections and arrange for re-inspection.

C. Reports: Prepare inspection reports and have them signed by authorities having jurisdiction.

D. Test sanitary drainage and vent piping according to procedures of authorities having jurisdiction or, in absence of published procedures, as follows:
   1. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired. If testing is performed in segments, submit separate report for each test, complete with diagram of portion of piping tested.
   2. Leave uncovered and unconcealed new, altered, extended, or replaced drainage and vent piping until it has been tested and approved. Expose work that was covered or concealed before it was tested.
   3. Roughing-in Plumbing Test Procedure: Test drainage and vent piping except outside leaders on completion of roughing-in. Close openings in piping system and fill with water to point of overflow, but not less than 10-foot head of water. From 15 minutes before inspection starts to completion of inspection, water level must not drop. Inspect joints for leaks.
   4. Finished Plumbing Test Procedure: After plumbing fixtures have been set and traps filled with water, test connections and prove they are gastight and watertight. Plug vent-stack openings on roof and building drains where they leave building. Introduce air into piping system equal to pressure of 1-inch wg . Use U-tube or manometer inserted in trap of water closet to measure this pressure. Air pressure must remain constant without introducing additional air throughout period of inspection. Inspect plumbing fixture connections for gas and water leaks.
   5. Repair leaks and defects with new materials and retest piping, or portion thereof, until satisfactory results are obtained.
   6. Prepare reports for tests and required corrective action.

3.08 CLEANING AND PROTECTION

A. Clean interior of piping. Remove dirt and debris as work progresses.

B. Protect drains during remainder of construction period to avoid clogging with dirt and debris and to prevent damage from traffic and construction work.

C. Place plugs in ends of uncompleted piping at end of day and when work stops.

3.09 PIPING SCHEDULE

A. Aboveground, soil and waste piping NPS 4 and smaller shall be the following:
   1. Hubless, cast-iron soil pipe and fittings; CISPI and heavy-duty hubless-piping couplings; and coupled joints.

B. Aboveground, vent piping NPS 4 and smaller shall be the following:

1. Hubless, cast-iron soil pipe and fittings; CISPI or heavy-duty hubless-piping couplings; and coupled joints.

C. Underground, soil, waste, and vent piping **NPS 4** shall be the following:
1. Hubless, cast-iron soil pipe and fittings; CISPI or heavy-duty hubless-piping couplings; and coupled joints.

END OF SECTION

SECTION 22 1319

SANITARY WASTE PIPING SPECIALTIES

PART 1 - GENERAL

1.01 SUMMARY

A. This Section includes the following sanitary drainage piping specialties:
   1. Cleanouts.
   2. Miscellaneous sanitary drainage piping specialties.
   3. Flashing materials.

1.02 ACTION SUBMITTALS

A. Product Data: For each type of product indicated. Include rated capacities, operating characteristics, and accessories for grease interceptors.

1.03 QUALITY ASSURANCE

A. Drainage piping specialties shall bear label, stamp, or other markings of specified testing agency.

PART 2 - PRODUCTS

2.01 CLEANOUTS

A. Exposed Cast-Iron Cleanouts:
   1. 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:
      a. Josam Company; Josam Div.
      b. Smith, Jay R. Mfg. Co.; Division of Smith Industries, Inc.
      c. Watts Drainage Products Inc.
      d. Zurn Plumbing Products Group; Specification Drainage Operation.
   2. Standard: ASME A112.36.2M for cast iron for cleanout test tee.
   3. Size: Same as connected drainage piping
   4. Body Material: Hubless, cast-iron soil pipe test tee as required to match connected piping.
   5. Closure: Countersunk or raised-head, plastic plug.
   6. Closure Plug Size: Same as or not more than one size smaller than cleanout size.

B. Cast-Iron Floor Cleanouts:
   1. 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:
      a. Josam Company; Josam Div.
      b. Smith, Jay R. Mfg. Co.; Division of Smith Industries, Inc.
      c. Watts Drainage Products Inc.
      d. Zurn Plumbing Products Group; Specification Drainage Operation.
   2. Standard: ASME A112.36.2M for threaded, adjustable housing cleanout.
   3. Size: Same as connected branch.

4. Type: Threaded, adjustable housing.
5. Body or Ferrule: Cast iron.
6. Outlet Connection: Threaded.
7. Closure: Plastic plug.
8. Adjustable Housing Material: Cast iron with threads.
9. Frame and Cover Material and Finish: Polished bronze.
10. Frame and Cover Shape: Round.
11. Riser: ASTM A 74, Service class, cast-iron drainage pipe fitting and riser to cleanout.

C. Cast-Iron Wall Cleanout:
1. 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:
   a. Josam Company; Josam Div.
   b. Smith, Jay R. Mfg. Co.; Division of Smith Industries, Inc.
   c. Watts Drainage Products Inc.
   d. Zurn Plumbing Products Group; Specification Drainage Operation.
2. Standard: ASME A112.36.2M. Include wall access.
3. Size: Same as connected drainage piping.
4. Body: Hubless, cast-iron soil pipe test tee as required to match connected piping.
5. Closure: Countersunk or raised-head, cast-iron plug.
6. Closure Plug Size: Same as or not more than one size smaller than cleanout size.
7. Wall Access: Round, flat, chrome-plated brass or stainless-steel cover plate with screw.

2.02 MISCELLANEOUS SANITARY DRAINAGE PIPING SPECIALTIES

A. Sleeve Flashing Device:
1. Description: Manufactured, cast-iron fitting, with clamping device, which forms sleeve for pipe floor penetrations of floor membrane. Include galvanized-steel pipe extension in top of fitting that will extend 2 inches above finished floor and galvanized-steel pipe extension in bottom of fitting that will extend through floor slab.
2. Size: As required for close fit to riser or stack piping.

2.03 FLASHING MATERIALS

A. Lead Sheet: ASTM B 749, Type L51121, copper bearing, with the following minimum weights and thicknesses, unless otherwise indicated:
1. General Use: 4.0-lb/sq. ft., 0.0625-inch thickness.
2. Vent Pipe Flashing: 3.0-lb/sq. ft., 0.0469-inch thickness.
3. Burning: 6-lb/sq. ft., 0.0938-inch thickness.

B. Fasteners: Metal compatible with material and substrate being fastened.

C. Metal Accessories: Sheet metal strips, clamps, anchoring devices, and similar accessory units required for installation; matching or compatible with material being installed.

D. Solder: ASTM B 32, lead-free alloy.

E. Bituminous Coating: SSPC-Paint 12, solvent-type, bituminous mastic.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install cleanouts in aboveground piping and building drain piping according to the following, unless otherwise indicated:
   1. Size same as drainage piping up to NPS 4. Use NPS 4 for larger drainage piping unless larger cleanout is indicated.
   2. Locate at each change in direction of piping greater than 45 degrees.
   3. Locate at minimum intervals of 50 feet for piping NPS 4 and smaller and 100 feet for larger piping.
   4. Locate at base of each vertical soil and waste stack.

B. For floor cleanouts for piping below floors, install cleanout deck plates with top flush with finished floor.

C. For cleanouts located in concealed piping, install cleanout wall access covers, of types indicated, with frame and cover flush with finished wall.

D. Install sleeve flashing device with each riser and stack passing through floors with waterproof membrane.

E. Install traps on plumbing specialty drain outlets. Omit traps on indirect wastes unless trap is indicated.

3.02 CONNECTIONS

A. Piping installation requirements are specified in other Division 22 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.

B. Install piping adjacent to equipment to allow service and maintenance.

3.03 FLASHING INSTALLATION

A. Fabricate flashing from single piece unless large pans, sumps, or other drainage shapes are required. Join flashing according to the following if required:

   1. Lead Sheets: Burn joints of lead sheets 6.0-lb/sq. ft., 0.0938-inch thickness or thicker. Solder joints of lead sheets 4.0-lb/sq. ft., 0.0625-inch thickness or thinner.

B. Install sheet flashing on pipes, sleeves, and specialties passing through or embedded in floors and roofs with waterproof membrane.
   1. Pipe Flashing: Sleeve type, matching pipe size, with minimum length of 10 inches, and skirt or flange extending at least 8 inches around pipe.
   2. Sleeve Flashing: Flat sheet, with skirt or flange extending at least 8 inches around sleeve.
   3. Embedded Specialty Flashing: Flat sheet, with skirt or flange extending at least 8 inches around specialty.

C. Set flashing on floors and roofs in solid coating of bituminous cement.

D. Secure flashing into sleeve and specialty clamping ring or device.

E. Extend flashing up vent pipe passing through roofs and turn down into pipe, or secure flashing into cast-iron sleeve having calking recess.

3.04 LABELING AND IDENTIFYING

A. Equipment Nameplates and Signs: Install engraved plastic-laminate equipment nameplate or sign on or near each grease interceptor.

B. Distinguish among multiple units, inform operator of operational requirements, indicate safety and emergency precautions, and warn of hazards and improper operations, in addition to identifying unit. Nameplates and signs are specified in Division 22 Section "Identification for Plumbing Piping and Equipment."

3.05 PROTECTION

A. Protect drains during remainder of construction period to avoid clogging with dirt or debris and to prevent damage from traffic or construction work.

B. Place plugs in ends of uncompleted piping at end of each day or when work stops.

END OF SECTION

SECTION 22 4213

COMMERCIAL WATER CLOSETS

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Water closets.
   2. Flushometer valves.
   3. Toilet seats.

1.02 ACTION SUBMITTALS

A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.01 FLOOR-MOUNTED, BOTTOM-OUTLET WATER CLOSETS (WC-1)

A. Water Closets: Floor mounted, bottom outlet, top spud.
   1. Manufacturers: As indicated in Plans or approved equal, accessible where indicated on Architectural plans.
   2. Bowl:
      a. Standards: ASME A112.19.2/CSA B45.1 and ASME A112.19.5.
      b. Material: Vitreous china.
      c. Type: Siphon jet.
      d. Style: Flushometer valve.
      e. Height: As indicated on Architectural plans.
      f. Rim Contour: Elongated.
      g. Water Consumption: 1.28 gal. per flush.
      h. Spud Size and Location: NPS 1-1/2; top.
      i. Color: White.
   3. Bowl-to-Drain Connecting Fitting: ASME A112.4.3.

2.02 FLUSHOMETER VALVES

A. Flushometer Valves:
   1. Manufacturers: As indicated on Plans or approved equal.
   2. Standard: ASSE 1037.
   3. Minimum Pressure Rating: 125 psig.
   4. Features: Include integral check stop and backflow-prevention device.
   5. Material: Brass body with corrosion-resistant components.
   6. Exposed Flushometer-Valve Finish: Chrome plated.
   7. Panel Finish: Chrome plated or stainless steel.
   8. Style: Exposed.
   9. Consumption: 1.28 gal. per flush.

2.03 TOILET SEATS

A. Toilet Seats:

1. Manufacturers: As indicated on Plans or approved equal.
2. Standard: IAPMO/ANSI Z124.5.
3. Material: Plastic.
4. Type: Commercial (Standard).
5. Shape: Elongated rim, open front.
6. Hinge: Self-sustaining.
7. Hinge Material: Non-corroding metal.
8. Seat Cover: Not required.
9. Color: White.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Water-Closet Installation:
1. Install level and plumb according to roughing-in drawings.
2. Install floor-mounted water closets on bowl-to-drain connecting fitting attachments to piping or building substrate.
3. Install accessible, wall-mounted water closets at mounting height for handicapped/elderly, according to ICC/ANSI A117.1.

B. Flushometer-Valve Installation:
1. Install flushometer-valve, water-supply fitting on each supply to each water closet.
2. Attach supply piping to supports or substrate within pipe spaces behind fixtures.
3. Install lever-handle flushometer valves for accessible water closets with handle mounted on open side of water closet.

C. Install toilet seats on water closets.

D. Wall Flange and Escutcheon Installation:
1. Install wall flanges or escutcheons at piping wall penetrations in exposed, finished locations and within cabinets and millwork.
2. Install deep-pattern escutcheons if required to conceal protruding fittings.
3. Comply with escutcheon requirements specified in Division 22 Section "Escutcheons for Plumbing Piping."

E. Joint Sealing:
1. Seal joints between water closets and walls and floors using sanitary-type, one-part, mildew-resistant silicone sealant.
2. Match sealant color to water-closet color.

3.02 CONNECTIONS

A. Connect water closets with water supplies and soil, waste, and vent piping. Use size fittings required to match water closets.

B. Comply with water piping requirements specified in Division 22 Section "Domestic Water Piping."

C. Comply with soil and waste piping requirements specified in Division 22 Section "Sanitary Waste and Vent Piping."

D. Where installing piping adjacent to water closets, allow space for service and maintenance.

3.03 ADJUSTING

A. Operate and adjust water closets and controls. Replace damaged and malfunctioning water closets, fittings, and controls.

B. Adjust water pressure at flushometer valves to produce proper flow.

3.04 CLEANING AND PROTECTION

A. Clean water closets and fittings with manufacturers' recommended cleaning methods and materials.

B. Install protective covering for installed water closets and fittings.

C. Do not allow use of water closets for temporary facilities unless approved in writing by Owner.

END OF SECTION

SECTION 22 4216

COMMERCIAL LAVATORIES

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Lavatories.
   2. Faucets.

1.02 ACTION SUBMITTALS

A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.01 VITREOUS-CHINA, WALL-MOUNTED LAVATORIES (LV-1)

A. Lavatory: Vitreous china, wall mounted, with back.
   1. Manufacturers: As indicated in Plans or approved equal.
   2. Fixture:
      a. Standard: ASME A112.19.2/CSA B45.1.
      b. Type: For wall hanging.
      c. Nominal Size: Oval, 19 by 17 inches.
      d. Faucet-Hole Punching: Single hole.
      e. Faucet-Hole Location: Top.
      f. Color: White.
      g. Mounting Material: Chair carrier.
   3. Support: ASME A112.6.1M, Type II, concealed-arm lavatory carrier with escutcheons. Include rectangular, steel uprights.

2.02 SOLID-BRASS, MANUALLY OPERATED FAUCETS

A. NSF Standard: Comply with NSF/ANSI 61, "Drinking Water System Components - Health Effects," for faucet materials that will be in contact with potable water.

B. Lavatory Faucets (LV-1):
   1. Manufacturers: As indicated in Plans or approved equal:

   2. Standard: ASME A112.18.1/CSA B125.1.
   3. General: Coordinate faucet inlets with supplies and fixture hole punchings; coordinate outlet with spout and fixture receptor.
   4. Body Type: Single hole.
   5. Body Material: Commercial, solid brass.
   6. Finish: Polished chrome plate.
   7. Maximum Flow Rate: 0.5 gpm.
   8. Mounting Type: Deck, exposed.
   9. Spout: Rigid type.
   10. Spout Outlet: Aerator.

2.03 SUPPLY FITTINGS

A. NSF Standard: Comply with NSF/ANSI 61, "Drinking Water System Components - Health Effects," for supply-fitting materials that will be in contact with potable water.

B. Standard: ASME A112.18.1/CSA B125.1.

C. Supply Piping: Chrome-plated-brass pipe or chrome-plated copper tube matching water-supply piping size. Include chrome-plated-brass or stainless-steel wall flange.

D. Supply Stops: Chrome-plated-brass, one-quarter-turn, ball-type or compression valve with inlet connection matching supply piping.

E. Operation: Loose key.

F. Risers:
1. ASME A112.18.6, braided- or corrugated-stainless-steel, flexible hose riser.

2.04 WASTE FITTINGS

A. Standard: ASME A112.18.2/CSA B125.2.

B. Drain: Grid type with NPS 1-1/4 offset and straight tailpiece.

C. Trap:

1. Size: NPS 1-1/2 by NPS 1-1/4.
2. Material: Stainless-steel, two-piece trap and swivel elbow with 0.012-inch-thick stainless-steel tube to wall; and stainless-steel wall flange.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine roughing-in of water supply and sanitary drainage and vent piping systems to verify actual locations of piping connections before lavatory installation.

B. Examine counters and walls for suitable conditions where lavatories will be installed.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. Install lavatories level and plumb according to roughing-in drawings.

B. Install supports, affixed to building substrate, for wall-mounted lavatories.

C. Install accessible wall-mounted lavatories at handicapped/elderly mounting height for people with disabilities or the elderly, according to ICC/ANSI A117.1.

D. Install wall flanges or escutcheons at piping wall penetrations in exposed, finished locations. Use deep-pattern escutcheons if required to conceal protruding fittings. Comply with escutcheon requirements specified in Division 22 Section "Escutcheons for Plumbing Piping."

E. Seal joints between lavatories and counters and walls using sanitary-type, one-part, mildew-resistant silicone sealant. Match sealant color to fixture color.

F. Install protective shielding pipe covers and enclosures on exposed supplies and waste piping of accessible lavatories. Comply with requirements in Division 22 Section "Plumbing Piping Insulation."

3.03 CONNECTIONS

A. Connect fixtures with water supplies, stops, and risers, and with traps, soil, waste, and vent piping. Use size fittings required to match fixtures.

B. Comply with water piping requirements specified in Division 22 Section "Domestic Water Piping."

C. Comply with soil and waste piping requirements specified in Division 22 Section "Sanitary Waste and Vent Piping."

3.04 ADJUSTING

A. Operate and adjust lavatories and controls. Replace damaged and malfunctioning lavatories, fittings, and controls.

B. Adjust water pressure at faucets to produce proper flow.

3.05 CLEANING AND PROTECTION

A. After completing installation of lavatories, inspect and repair damaged finishes.

B. Clean lavatories, faucets, and other fittings with manufacturers' recommended cleaning methods and materials.

C. Provide protective covering for installed lavatories and fittings.

D. Do not allow use of lavatories for temporary facilities unless approved in writing by Owner.

END OF SECTION

SECTION 23 0593

TESTING, ADJUSTING, AND BALANCING

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Testing, adjusting, and balancing of air system.

1.02 SUBMITTALS

A. Draft Reports: Submit for review prior to final acceptance of Project.

B. Test Reports: Submit prior to final acceptance of Project and for inclusion in operating and maintenance manuals. Assemble in soft cover, letter size, 3-ring binder, with table of contents page and tabs, and cover identification. Include reduced scale drawings with air outlets and equipment identified to correspond with data sheets, and indicating thermostat locations.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.01 EXAMINATION

A. Before starting work, verify exhaust fan and ductwork system is complete and operable.

B. Report defects, deficiencies, or abnormal conditions in mechanical systems preventing system balance including existing fans. Replace filters prior to testing airflows.

C. Beginning of work means acceptance of existing conditions.

3.02 INSTALLATION TOLERANCES

A. Air Handling Systems: Adjust airflow to within plus or minus 10 percent of design for exhaust systems.

B. Air Inlets: Adjust airflow to within plus or minus 10 percent of design.

3.03 AIR SYSTEM PROCEDURE

A. Make air flow rate measurements in ducts by traverse of entire cross sectional area of duct.

B. Measure air quantities at air inlets.

C. Use volume control devices to regulate air quantities only to extent those adjustments do not create objectionable air motion or sound levels.

D. Vary total system air quantities by adjustment of fan speeds. Provide required sheaves at no additional cost. Note sheave and belt size in report

E. Measure static air pressure conditions at fan intake and discharge and total pressure across fan.

F. Measure and record rated and actual electrical voltages and amperages for three phases for motors and entire rooftop unit.

G. Note fan make, model and serial number.

3.04 FIELD QUALITY CONTROL

A. Verify recorded data represents actually measured or observed conditions.

B. Permanently mark settings of valves, dampers, and other adjustment devices. Set and lock memory stops.

END OF SECTION

SECTION 23 0700

MECHANICAL INSULATION

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:
   1. HVAC ductwork insulation, jackets, and accessories.

1.02 SUBMITTALS

A. Product Data: Submit product description, thermal characteristics and list of materials and thickness for each service, and location.

B. Manufacturer's Installation Instructions: Submit manufacturers published literature indicating proper installation procedures.

C. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.03 QUALITY ASSURANCE

A. Test insulation for maximum flame spread index of 25 and maximum smoke developed index of not exceeding 50 in accordance with ASTM E84.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Accept materials on site in original factory packaging, labeled with manufacturer's identification, including product density and thickness.

B. Protect insulation from weather and construction traffic, dirt, water, chemical, and damage, by storing in original wrapping.

1.05 ENVIRONMENTAL REQUIREMENTS

A. Install insulation only when ambient temperature and humidity conditions are within range recommended by manufacturer.

B. Maintain temperature before, during, and after installation for minimum period of 24 hours.

1.06 WARRANTY

A. Furnish five year manufacturer warranty for man-made fiber.

PART 2 PRODUCTS

2.01 MANUFACTURER

2.02 DUCTWORK INSULATION

A. TYPE D-1: ASTM C1290, Type III, flexible glass fiber, commercial grade with factory applied reinforced aluminum foil jacket meeting ASTM C1136, Type II.
   1. Thermal Conductivity: 0.25 at 75 degrees F.
   2. Maximum Operating Temperature: 250 degrees F.
   3. Density: 1.5 pound per cubic foot.
   4. Total R-Value: Thickness to provide a minimum of R-6

2.03 DUCTWORK INSULATION ACCESSORIES

A. Vapor Retarder Lap Adhesive: Compatible with insulation.

B. Adhesive: Waterproof, ASTM E162 fire-retardant type.

C. Tie Wire: 0.048 inch stainless steel with twisted ends on maximum 12 inch centers.

D. Lagging Adhesive: Fire retardant type with maximum 25/450 flame spread/smoke developed index when tested in accordance with ASTM E84.

E. Adhesives: Compatible with insulation.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify ductwork has been tested before applying insulation materials.

B. Verify surfaces are clean and dry, with foreign material removed.

3.02 INSTALLATION - DUCTWORK SYSTEMS

A. Duct dimensions indicated on Drawings are finished inside dimensions.

B. Insulated ductwork conveying air below ambient temperature:
   1. Provide insulation with vapor retarder jackets.
   2. Finish with tape and vapor retarder jacket.
   3. Continue insulation through walls, sleeves, hangers, and other duct penetrations.
   4. Insulate entire system including fittings, joints, flanges, fire dampers, flexible connections, and expansion joints.

C. External Glass Fiber Duct Insulation:
   1. Secure insulation with vapor retarder with wires and seal jacket joints with vapor retarder adhesive or tape to match jacket.
   2. Secure insulation without vapor retarder with staples, tape, or wires.
   3. Install without sag on underside of ductwork. Use adhesive or mechanical fasteners where necessary to prevent sagging. Lift ductwork off trapeze hangers and insert spacers.
   4. Seal vapor retarder penetrations by mechanical fasteners with vapor retarder adhesive.
   5. Stop and point insulation around access doors and damper operators to allow operation without disturbing wrapping.

3.03 SCHEDULES

A. Ductwork Insulation Schedule:

DUCTWORK SYSTEM	INSULATION TYPE	INSULATION THICKNESS inches
Supply Ducts (externally insulated)	D-1	2.0
Return Ducts (externally insulated)	D-1	2.0

END OF SECTION

SECTION 23 3000

AIR DISTRIBUTION

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Air Outlets.
   2. Stainless Steel Duct.

1.02 SUBMITTALS

A. Product Data:
   1. Submit sizes, capacities, materials, controls and connections to other work.
   2. Submit catalog performance ratings, construction, electric and duct connections, flashing and dimensions for fans and exhausters.

B. Manufacturer's Installation Instructions: Submit relevant instructions.

PART 2 PRODUCTS

2.01 AIR OUTLETS AND INLETS

A. Registers/Grilles: Rectagular, 0 degree deflection blades, opposed blade damper and equalizing grid; aluminum construction; baked enamel off-white finish.

2.02 DUCTWORK

A. Duct Materials:
   1. Stainless Steel Ducts: ASTM ASTM A240/A240M OR ASTM 666, Type 316.
   2. Fasteners: Rivets, bolts, or sheet metal screws.

B. Ductwork Fabrication:
   1. Fabricate and support rectangular ducts in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible. Provide duct material, gages, reinforcing, and sealing for operating pressures indicated.
   2. Construct T's, bends, and elbows with minimum radius 1-1/2 times centerline duct width. Where not possible and where rectangular elbows are used, provide [airfoil] turning vanes. Where acoustical lining is indicated, furnish turning vanes of perforated metal with glass fiber insulation.
   3. Seal joints between duct sections and duct seams with welds, gaskets, mastic adhesives, mastic plus embedded fabric systems, or tape.
      a. Sealants, Mastics and Tapes: Conform to UL 181A. Provide products bearing appropriate UL 181A markings.
      b. Do not provide sealing products not bearing UL approval markings.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify sizes of equipment connections before fabricating transitions.

B. Verify installation of ducts and equipment are ready for accessories.

C. Check location of air outlets and inlets and make necessary adjustments in position to conform to architectural features, symmetry, and lighting arrangement.

3.02 INSTALLATION

A. During construction install temporary closures on open ductwork to prevent construction dust from entering ductwork system.

B. Do not operate fans until ductwork is clean, bearings lubricated, and fan has been test run under observation.

C. Install sheaves required for final air balance.

D. Metal Ducts: Install in accordance with SMACNA Duct Construction Standards - Metal and Flexible.

END OF SECTION

SECTION 23 3050

COMMON WORK RESULTS FOR HVAC

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Identification for HVAC Ducting and Equipment.

1.02 SUBMITTALS

A. Shop Drawings: Submit for piping and equipment identification list of wording, symbols, letter size, and color coding for pipe identification and valve chart and schedule, including valve tag number, location, function, and valve manufacturer's name and model number.

B. Product Data for Pipe and Equipment Identification: Submit for mechanical identification manufacturers catalog literature for each product required.

PART 2 PRODUCTS

2.01 IDENTIFICATION FOR HVAC DUCTING AND EQUIPMENT

A. Plastic Nameplates: Laminated three-layer plastic with engraved black letters on light background color. Mount on fans

B. Plastic Tape Duct Markers: Flexible, vinyl film tape with pressure sensitive adhesive backing and printed markings. Color and Lettering: Conform to ASME A13.1.

PART 3 EXECUTION

3.01 INSTALLATION - PIPING AND EQUIPMENT IDENTIFICATION

A. Install plastic nameplates with adhesive and stainless steel fasteners.

B. Install plastic tape markers with pressure sensitive tape and in location easy to read from floor below.

END OF SECTION

SECTION 26 0519

WIRE AND CABLE

PART 1 GENERAL

1.01 SUMMARY

A. Section includes building 600 volt wire, UTP cable, optical fiber cable, wiring connectors and connections.

1.02 REFERENCES

A. NECA 1 (National Electrical Contractors Association) - Standard of Installation.

B. NETA ATS (International Electrical Testing Association) - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.

C. ANSI/NFPA 70 - National Electrical Code

D. ANSI/TIA/EIA 568-B – Commercial Building Telecommunications Cabling

1.03 DESCRIPTION OF WORK

A. The requirements of this section apply to cable and wires specified on the drawings and in these specifications. The extent of electrical wire and cable work is indicated on drawings and schedules, and by the requirements of this section. The applications for cable, wire and connectors required, but not limited to, are as follows:
   1. Power distribution circuitry.
   2. Lighting circuitry.
   3. Equipment circuitry.
   4. Communications cabling.

B. Conductor sizes are based on copper. Wire and cable routing shown on drawings is diagrammatic unless dimensioned. Route wire and cable as required for project conditions. Support raceway and cables in accordance with other sections of these specifications.

1.04 REGULATORY REQUIREMENTS

A. Furnish products listed and classified by Underwriters Laboratories, Inc. (UL), Electrical Testing Laboratories, Inc. (ETL), or other recognized, acceptable testing and listing agencies as suitable for the purpose specified and shown.

1.05 SUBMITTALS

A. Section 01 3300 - Submittal Procedures

B. Product Data: Submit manufacturer’s catalog cuts and technical data for building wire and cables.

C. Test Report: Measure overall insulation resistance to ground. Provide certified test report for Engineer’s Review.

1.06 CLOSEOUT SUBMITTALS

A. Section 01 700 - Execution Requirements, Closeout Procedures.

B. Project Record Documents: Record actual locations of components and circuits.

1.07 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum five years' experience.

1.08 FIELD MEASUREMENTS

A. Verify field measurements as indicated on drawings.

1.09 COORDINATION

A. Where wire and cable destination is indicated and routing is not shown, determine exact routing and lengths required.

B. Wire and cable routing indicated is approximate unless dimensioned. Include wire and cable lengths within 10 feet of length shown.

PART 2 PRODUCTS

2.01 BUILDING WIRE AND CABLE

A. Building wire and cable shall be insulated, single conductor, copper, stranded, rated for 600-volts AC. The insulation shall be thermoplastic material rated for 90 degrees Celsius dry locations, 75 degrees Celsius wet locations, THHN/THWN, RHW or XHHW, per ANSI/NFPA 70.

2.02 WIRE COLOR CODE

A. Color-code all conductors:
   1. Wire sizes 10 AWG and smaller shall have integral color-coded insulation.
   2. Wire sizes 8 AWG and larger may have black insulation but shall be identified by color-coded electrical tape at all junction, splice, pull, or termination points.
   3. Color tape shall be applied to at least 3-inches of the conductor at the termination ends and in junction or pull boxes or where readily accessible.
   4. Conductors for all systems shall not change color at splice points.
   5. Where there are two or more neutrals in one conduit, each shall be individually identified with the proper circuit.
   6. For 4 AWG and larger ground conductors, identify with green tape at both ends and all visible points, included in all junction boxes.
   7. Each phase shall be uniquely color-coded.
   8. Color-code wires as indicated below:

	120/240-Volts	120/208-Volts	277/480-Volts
Phase:	a – black	a - black	a – brown
	b – red	b - red	b - orange
	n – white	c - blue	c - yellow
	g – green	n - white	n - white, or gray
		g - green	g – green

2.03 DATA COMMUNICATIONS CABLE

A. ANSI/TIA/EIA 568 B2, Category 6, 4-pair UTP, #24 AWG.

2.04 OPTICAL FIBER CABLE

A. ANSI/TIA/EIA 568 B3, 6 strand 62.5/125 multimode, tight buffer. Terminate both ends with LC-style connectors.

2.05 DATA COMMUNICATIONS WIRING ACCESSORIES

A. Provide data communications wiring accessories as indicated on the drawings.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that mechanical work likely to damage wire and cable has been completed.

B. Verify that raceway installation is complete and supported.

3.02 PREPARATION

A. Completely and thoroughly clean and swab raceway before installing wire.

3.03 EXISTING WORK

A. Extend existing circuits using materials and methods and compatible with existing electrical installations, or as otherwise specified.

B. Remove all unused and abandoned signal and control wiring from end to end.

3.04 INSTALLATION OF WIRE

A. General:
   1. Install wire in accordance with manufacturer's instructions and NECA “Standard of Installation”.
   2. Route wire as required for project conditions.
   3. Identify and color code wire. Identify each conductor with its circuit number or other designation indicated.
   4. Protect exposed wire from damage.
   5. Pull all conductors into raceway at same time.
   6. Use suitable wire pulling lubricant for building wire 4 AWG and larger.
   7. Neatly train and lace wiring inside boxes, equipment, and panelboards

B. Special Techniques - Wiring Connections:
   1. Clean conductor surfaces before installing lugs and connectors. Where an anti-oxidation lubricant is used, apply liberally, coating all exposed conductor surfaces.
   2. Use suitable fittings and connectors.
   3. Make splices, taps, and terminations to carry full ampacity of conductors with no perceptible temperature rise.

4. Tape un-insulated conductors and connector with two layers of half-lapped rubber insulating compound tape and two layers of half-lapped, 7-mil electrical tape, Scotch 33+, or equal.
5. Use split bolt connectors for copper conductor splices and taps, 8 AWG and larger.
6. Use solderless pressure connectors with insulating covers for copper conductor splices and taps, 8 AWG and smaller.
7. Use insulated spring wire connectors with plastic caps for copper conductor splices and taps, 10 AWG and smaller.
8. Stranded conductors for control circuits shall have fork or ring terminals crimped on for all device terminations. Bare stranded conductors shall not be placed directly under the screws.

3.05 INSTALLATION OF DATA COMMUNICATION CABLES

A. Comply with NECA 1.

B. General Requirements for Cabling:
1. Comply with TIA/EIA-568-B.1.
2. Comply with BICSI ITSIM, Ch. 6, "Cable Termination Practices."
3. Install 110-style IDC termination hardware unless otherwise indicated.
4. Terminate conductors; no cable shall contain unterminated elements. Make terminations only at indicated outlets, terminals, cross-connects, and patch panels.
5. Cables may not be spliced. Secure and support cables at intervals not exceeding 30 inches (760 mm) and not more than 6 inches (150 mm) from cabinets, boxes, fittings, outlets, racks, frames, and terminals.
6. Install lacing bars to restrain cables, to prevent straining connections, and to prevent bending cables to smaller radii than minimums recommended by manufacturer.
7. Bundle, lace, and train conductors to terminal points without exceeding manufacturer's limitations on bending radii, but not less than radii specified in BICSI ITSIM, "Cabling Termination Practices" Chapter. Install lacing bars and distribution spools.
8. Do not install bruised, kinked, scored, deformed, or abraded cable. Do not splice cable between termination, tap, or junction points. Remove and discard cable if damaged during installation and replace it with new cable.
9. In the communications equipment room, install a 10-foot- (3-m-) long service loop on each end of cable.
10. Pulling Cable: Comply with BICSI ITSIM, Ch. 4, "Pulling Cable." Monitor cable pull tensions.

C. UTP Cable Installation:
1. Comply with TIA/EIA-568-B.2.
2. Do not untwist UTP cables more than 1/2 inch (12 mm) from the point of termination to maintain cable geometry.

D. Open-Cable Installation:
1. Install cabling with horizontal and vertical cable guides in telecommunications spaces with terminating hardware and interconnection equipment.
2. Suspend UTP cable not in a wireway or pathway a minimum of 8 inches (200 mm) above ceilings by cable supports not more than 60 inches (1524 mm) apart.
3. Cable shall not be run through structural members or in contact with pipes, ducts, or other potentially damaging items.

E. Group connecting hardware for cables into separate logical fields.

F. Separation from EMI Sources:
   1. Comply with BICSI TDMM and TIA-569-B for separating unshielded copper voice and data communication cable from potential EMI sources, including electrical power lines and equipment.
   2. Separation between Communications Cables and Fluorescent Fixtures: A minimum of 5 inches (127 mm).

3.06 FIELD QUALITY CONTROL FOR WIRE

A. Visual and Mechanical Inspection:
   1. Inspect wire for physical damage and proper connection.
   2. Measure tightness of bolted connections and compare torque measurements with manufacturer's recommended values.
   3. Verify continuity of each branch circuit conductor.
   4. Inspect compression-applied connectors for correct cable match and indentation.

B. Electrical Testing and Verification:
   1. All 600 volt conductors 8 AWG and larger, shall be verified by use of a 500-volt meg-ohm-meter.
   2. Perform continuity test to insure correct cable connection.
   3. Correct malfunctions and/or deficiencies immediately as detected at no additional cost to the owner, including additional verification testing.
   4. Compile test report results and submit for approval
   5. Subsequent to final wire and cable terminations, energize all circuitry and demonstrate functional adequacy in accordance with system requirements.

C. Test Values
   1. Compare bolted connection resistance to values of similar connections.
   2. Bolt-torque levels should be in accordance with NETA ATS Table 10.12 unless otherwise specified by the manufacturer.
   3. Minimum insulation-resistance values should not be less than 50 meg-ohms.
   4. Investigate deviations between adjacent phases.

3.07 FIELD QUALITY CONTROL FOR DATA COMMUNICATIONS CABLE

A. Perform the following tests and inspections:
   1. Visually inspect cable jacket materials for NRTL certification markings. Inspect cabling terminations in communications equipment rooms for compliance with color-coding for pin assignments, and inspect cabling connections for compliance with TIA/EIA-568-B.1.
   2. Visually confirm Category 6 marking of outlets, cover plates, outlet/connectors, and patch panels.
   3. Visually inspect cable placement, cable termination, grounding and bonding, equipment and patch cords, and labeling of all components.
   4. Test UTP backbone copper cabling for DC loop resistance, shorts, opens, intermittent faults, and polarity between conductors. Test operation of shorting bars in connection blocks. Test cables after termination but not cross-connection.
      a. Test instruments shall meet or exceed applicable requirements in TIA/EIA-568-B.2. Perform tests with a tester that complies with performance requirements in "Test Instruments (Normative)" Annex, complying with measurement accuracy specified in "Measurement Accuracy (Informative)" Annex. Use only test cords and adapters that are qualified by test equipment manufacturer for channel or link test configuration.
   5. UTP Performance Tests:

a. Test for each outlet. Perform the following tests according to TIA/EIA-568-B.1 and TIA/EIA-568-B.2:
   1) Wire map.
   2) Length (physical vs. electrical, and length requirements).
   3) Insertion loss.
   4) Near-end crosstalk (NEXT) loss.
   5) Power sum near-end crosstalk (PSNEXT) loss.
   6) Equal-level far-end crosstalk (ELFEXT).
   7) Power sum equal-level far-end crosstalk (PSELFEXT).
   8) Return loss.
   9) Propagation delay.
   10) Delay skew.

6. Optical Fiber Cable Tests:
   a. Test instruments shall meet or exceed applicable requirements in TIA/EIA-568-B.1. Use only test cords and adapters that are qualified by test equipment manufacturer for channel or link test configuration.
   b. Link End-to-End Attenuation Tests:
      1) Multimode backbone link measurements: Test at 850 or 1300 nm in 1 direction according to TIA/EIA-526-14-A, Method B, One Reference Jumper.
      2) Attenuation test results for backbone links shall be less than 2.0 dB. Attenuation test results shall be less than that calculated according to equation in TIA/EIA-568-B.1.
7. Final Verification Tests: Perform verification tests for UTP systems after the complete communications cabling and workstation outlet/connectors are installed.
   a. Voice Tests: These tests assume that dial tone service has been installed. Connect to the network interface device at the demarcation point. Go off-hook and listen and receive a dial tone. If a test number is available, make and receive a local, long distance, and digital subscription line telephone call.
   b. Data Tests: These tests assume the Information Technology Staff has a network installed and is available to assist with testing. Connect to the network interface device at the demarcation point. Log onto the network to ensure proper connection to the network.

B. Document data for each measurement. Data for submittals shall be printed in a summary report that is formatted similar to Table 10.1 in BICSI TDMM, or transferred from the instrument to the computer, saved as text files, and printed and submitted.

C. End-to-end cabling will be considered defective if it does not pass tests and inspections.

D. Prepare test and inspection reports.

END OF SECTION

SECTION 26 0526

BASIC ELECTRICAL MATERIALS, METHODS AND GROUNDING

PART 1 GENERAL

1.01 SUMMARY

A. This section includes grounding conductors; equipment grounding conductors; bonding methods and materials; conduit and equipment supports; anchors and fasteners; sealing and fireproofing of sleeves and openings between conduits and wall.

1.02 RELATED SECTIONS

A. Section 26 05 19 - 600-Volt Wire and Cable

B. Section 26 05 33 - Raceways and Boxes

C. Section 26 05 53 - Electrical Equipment Identification

D. Section 26 24 16 - Panelboards

1.03 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. The standards referenced herein, except as modified in the Contract Documents, shall have full force and effect as though included in these Specifications. These standards are not furnished to the Contactor since manufacturers and trades involved are assumed to be familiar with these requirements. The Contractor shall obtain copies of reference standards direct from publication sources as needed for proper performance and completion of the work.

1.	ASTM B 187	Specifications for Copper Bus, Rod, and Shapes.
2.	ASTM A 653	Standard Specifications for Sheet Steel, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated(Galvannealed) by Hot Dip Process
3.	IEEE 142	Recommended Practice for Grounding of Industrial and Commercial Power Systems.
4.	IEEE 1100	Recommended Practice for Powering and Grounding Electronic Equipment.
5.	NECA	(National Electrical Contractors Association) – Standard of Installation.
6.	NETA ATS	Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.
7.	NFPA 70	National Electrical Code (NEC). Latest edition adopted by the State of California (CEC).
8.	UL 467	Electrical Grounding and Bonding Equipment.

1.04 SYSTEM DESCRIPTION

A. Anchor and fasten electrical products to building elements and finishes as follows:
1. Concrete Structural Elements: Provide preset inserts.
2. Concrete Surfaces: Provide epoxy or expansion anchors.
3. Interior Structural Steel: Provide appropriate size beam clamps.
4. Solid Masonry Walls: Use expansion anchors and preset inserts.
5. Sheet Metal: Provide sheet metal screws.

1.05 DESIGN REQUIREMENTS

A. Furnish products listed and classified by Underwriters Laboratories, Inc. (UL), Electrical Testing Laboratories, Inc. (ETL), or other recognized, acceptable testing and listing agencies as suitable for purpose specified and shown.

B. Grounding shall be in accordance with the National Electrical Code (NEC). Where size, type, rating and quantities indicated or specified are in excess of NEC requirements, the more stringent requirements and the greater size, rating, and quantity indications govern.

C. Select materials, sizes, and types of anchors, fasteners, and supports to carry at least twice the loads of equipment and raceway, including weight of wire and cable in raceway.

1.06 CONTRACTOR SUBMITTALS

A. Product Data:
   1. Submit product data for grounding electrodes and connections for fastening components; fire stopping material; and fireproofing sealants.

1.07 CLOSEOUT SUBMITTALS

A. Record actual locations of components and grounding electrodes.

B. Submit pdf copy, via email, of all final certified test reports.

1.08 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum five (5) years' experience.

B. Installer: A firm with at least five (5) years of installation experience on projects with electrical grounding work similar to that required for this project.

1.09 FIELD MEASUREMENTS

A. Verify field measurements prior to fabrication.

B. Field testing shall be performed by a third party testing firm with certification from a recognized testing agency, with a minimum of five (5) years of testing experience.

PART 2 PRODUCTS

2.01 GROUNDING SYSTEM

A. Except as indicated elsewhere, provide materials for electrical grounding system, including, but not limited to, cables, wires, connectors, terminals (solderless lugs) and exothermic welds, grounding rods and electrodes, bonding jumper and braided straps, and other items and accessories required for a complete installation. Where more than one type of material or equipment meets indicated requirements, selection shall be at Installer's option. Where materials or components are not otherwise indicated, provide products as recommended by the accessories manufacturers and in compliance with the NEC and established industry standards.

B. All grounding materials required shall be furnished new and undamaged in accordance with the requirements of these specifications:

2.02 WIRE

A. Electrical Equipment Grounding Conductor: Insulated, soft-drawn copper, Class B stranding or solid, with green colored polyvinyl chloride insulation per Section 26 05 19. Size per NEC Article 250-122, unless otherwise noted.

2.03 BONDING CONNECTIONS, TERMINALS AND CLAMPS

A. Provide electrical bonding connectors, terminals and clamps, and accessories as recommended by the manufacturer for the specific applications. Components shall be high-strength, high-conductivity copper alloy.

2.04 ANCHORS AND FASTENERS

A. Indoor Locations: Epoxy type anchors and heavy-duty, galvanized steel screws and bolts.

B. Outdoor Locations: Epoxy type or Red Head anchor bolts and stainless steel screws and bolts.

2.05 SUPPORT CHANNEL

A. All conduit and electrical equipment support channels for interior areas shall be galvanized.

2.06 SEALING AND FIREPROOFING

A. Furnish UL listed products or products tested by a nationally recognized independent testing laboratory. Select products with rating not less than the rating of the wall, ceiling or floor being penetrated.

B. Manufacturers:
1. 3M CP 25WB + Caulk
2. 3M FS 195 wrap or strip with restricting collar
3. 3M CS 195 composite sheets
4. Proset Systems fire rated floor and wall penetrations
5. Dow Corning Fire Stop System
6. Substitutions not permitted.

C. Use stamped steel, chrome plated, hinged, split ring escutcheons or floor/ceiling plates for covering openings in occupied areas where conduit is exposed.

D. In exterior wall openings below grade, use a modular mechanical type seal consisting of interlocking synthetic rubber links shaped to continuously fill the annular space between the conduit and the cored opening or a water-stop type wall sleeve.

E. At non-rated interior wall or floor openings use Tremco Fyre-Sil, Sika Corp. Sikaflex Ia, Sonneborn Sonolastic NPT, or Mameco Vulkem 116 urethane caulk or approved equal.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that abandoned wiring and equipment serve only abandoned facilities.

3.02 EXISTING WORK

A. Modify existing grounding system to maintain continuity to accommodate renovations.

B. Extend existing grounding system using materials and methods as specified.

C. Install temporary wiring and connections to maintain existing grounding systems in service during construction.

D. Plan work to avoid working on equipment while energized. Perform work on energized equipment or circuits with experienced and trained personnel following all safety rules and procedures.

E. Remove, relocate, and extend existing installations to accommodate new construction.

F. Repair adjacent construction and finishes that are damaged during demolition and extension work.

G. Remove exposed and/or abandoned grounding and bonding components, fasteners, supports and electrical identification labels. Cut embedded support elements below surface of walls and floors. Patch surfaces damaged by removal of existing components to match surrounding finishes.

3.03 GROUNDING AND BONDING INSTALLATION:

A. Verify that final backfill and compaction has been completed before driving rod electrodes.

B. Install grounding well with cover at rod locations as indicated on Drawings. Install well top flush with finished grade.

C. Installation:
1. Remove paint, rust, mill-oils, and surface contaminants at connection points.
2. Connect to site grounding system.
3. Accomplish grounding of electrical system by installing insulated grounding conductor with each feeder and branch circuit conductor in conduit. Install separate insulated conductor within each feeder and branch circuit raceway. Terminate each end on suitable lug, bus, or bushing. Size grounding conductor in accordance with the NEC.
4. Install grounding conductor from ground bus of serving panel to ground bus of served panel, grounding screw of receptacles, lighting fixture housings, light switch outlet boxes, and metal enclosures of service equipment.
5. Bond all metallic conduits to grounding bus at serving panel by means of grounding bushings using minimum No. 12 AWG conductor.
6. Ground electrical system using continuous metal raceway system enclosing circuit conductors in accordance with NEC. Bond together each metallic raceway, pipe, duct and other metal object entering enclosures and exiting slabs.
7. Permanently bond all equipment, grounding conductors, and grounding system prior to energizing equipment.

3.04 GROUND CONDUCTORS

A. Grounding conductors shall be located and connected as indicated on drawings or as required by Code.

B. Ground conductors under buildings or structures shall be buried with at least 6 inches of earth cover. Buried grounding conductors extending beyond the foundations of buildings or structures shall have at least 18 inches of earth cover.

C. Exposed conductors shall be installed inconspicuously in vertical or horizontal positions on supporting structures. When located on irregular supporting surfaces or equipment, the conductors shall run parallel to or normal to dominant surfaces.

D. Conductors routed over concrete, steel, or equipment surfaces shall be kept in close contact with those surfaces by using fasteners located at intervals not to exceed 3 feet.

E. Conductors passing through floor slabs shall be installed in conduit sleeves that extend above the floor slab, a minimum of 1-1/2 inches to provide protection. Sleeves shall be sealed to maintain fireproof integrity.

F. Provide a separate equipment-grounding conductor for low voltage distribution systems, single or three phase feeder circuit and each branch circuit with single or three phase protective devices. Install a grounding conductor in conduit with phase and neutral conductors. Single-phase branch circuits for 120 and 277 volt lighting, receptacles, and motors shall have a phase, neutral, and ground conductors installed in the common conduit. Provide suitable bonding jumpers and approved grounding type bushings for flexible conduits used for equipment connection utilized in conjunction with the above branch circuits. Single-phase circuits for equipment and all branch circuits installed in non-metallic or flexible conduits shall be provided with a separate grounding conductor.

G. Ground the neutral of separately derived systems with a bare copper conductor, installed in conduit, from the neutral directly to the building interior cold water pipe or nearest solidly grounded structural reinforcing steel, in accordance with the provisions of NEC Article 250-24. Use bolted accessible connections to the ground system so that the neutral ground can be disconnected for test. Ground the system ground conduit as detailed on drawing. Size the grounding electrode conductors in accordance with the NEC, Table 250-66, or as indicated.

3.05 CONNECTIONS

A. All connections shall be made by the exothermic welding process, except where otherwise indicated. The manufacturer's instructions on the use of exothermic welding materials shall be followed in all details. Powder and molds shall be kept dry and warm until use. Worn or damaged molds shall not be used.

B. All surfaces to be joined by the welds shall be thoroughly cleaned. Paint, scale, and other deleterious substances shall be removed from surfaces of ungalvanized structural steel members by grinding. Galvanized steel surfaces shall be cleaned with emery paper.

C. All exothermic welded connections shall successfully resist moderate hammer blows. Any connection which fails such test or which, upon inspection, indicates a porous or deformed weld, shall be remade.

D. All exothermic welds shall encompass 100 percent of the ends of the materials being welded. Welds, which do not meet this requirement, shall be remade.

E. Worn, damaged, incorrectly sized, or improperly shaped molds which, in the opinion of the Engineer, do not make satisfactory welds, shall be removed from the jobsite after being physically rendered inoperable.

F. All contact surfaces of bolted and screwed connections shall be thoroughly cleaned and coated with oxide inhibitor before being securely tightened.

3.06 CONDUIT GROUNDING

A. All grounding bushings within all enclosures, including equipment enclosures, shall be wired together and connected internally to the enclosure grounding lug or grounding bus with a bare copper conductor. Grounding bushings shall be grounded with conductors sized in accordance with NEC, but not smaller than No. 8 AWG.

3.07 EQUIPMENT GROUNDING

A. Comply with NEC 250, except where larger sizes or more conductors are indicated.
   1. All electrical equipment shall be connected to the grounding system with an insulated, green, stranded or solid copper equipment-grounding conductor.
   2. Terminate each end on suitable lug, bus, or bushing. The term "electrical equipment", as used in this article, shall include, but not be limited to, all enclosures containing electrical connections or bare conductors, except that individual devices, such as solenoids, pressure switches, and limit switches, shall be exempt from this requirement, unless the device requires grounding for proper operation.
   3. Large equipment, such as metal-clad or metal-enclosed switchgear, will be furnished with a grounding bus that shall be connected to the grounding system.
   4. Most other equipment will be furnished with grounding pads and/or grounding lugs which shall be connected to the grounding system. All ground connection surfaces shall be cleaned immediately prior to connection.
   5. Contractor shall furnish all grounding material required, if not furnished with the equipment.

B. Install equipment grounding system such that all metallic structures, enclosures, raceways, junction boxes, outlet boxes, cabinets, machine frames, portable equipment and other conductive items in close proximity with electrical circuits will operate continuously at ground potential and provide a low impedance path for possible ground fault currents.

C. Where grounding system extension stingers are indicated on the drawings to be provided for connection to electrical equipment, the Contractor shall connect the bare grounding conductor to the equipment ground bus, pad, or lug. Except where otherwise indicated on the drawings, all equipment ground conductors that are not an integral part of a cable assembly, shall be sized in accordance with the requirements of NEC. All ground conductors installed in conduit shall be insulated.

D. Suitable grounding facilities, acceptable to the Engineer, shall be furnished on electrical equipment not so equipped. The grounding facilities shall consist of compression type terminal connectors bolted to the equipment frame or enclosure and providing a minimum of joint resistance.

E. The conduit system is not considered to be a grounding conductor, except for lighting fixtures. No grounding conductor shall be smaller in size than No. 12 AWG, unless it is a part of an acceptable cable assembly.

3.08 ANCHORS, FASTENERS AND SUPPORT

A. Installation:
   1. Locate and install anchors, fasteners, and supports in accordance with NECA "Standard of Installation".
   2. Do not fasten supports to pipes, ducts, mechanical equipment, or conduit.
   3. Do not use spring steel clips and clamps.
   4. Do not use powder-actuated anchors.
   5. Do not drill or cut structural members.

B. Supports:
   1. Fabricate supports from structural steel or formed steel members. Rigidly weld members or install hexagon head bolts to present neat appearance with adequate strength and rigidity. Install spring lock washers under nuts.
   2. Install surface-mounted cabinets and panel board with minimum of four (4) anchors.
   3. Use steel channel supports to stand cabinets and panel boards one (1) inch off wall.
   4. Use sheet metal channel to bridge studs above and below cabinets and panel boards recessed in hollow partitions.

3.09 SEALING AND FIREPROOFING

A. Fire-Rated Surface:
   1. Where conduit penetrates fire rated surface, install fire-stopping product in accordance with manufacturer's published instructions.
   2. All openings through fire rated wall, floor, ceiling or roof must be sealed.

B. Non-Rated Surfaces:
   1. Opening through a non-fire rated wall, floor, ceiling or roof must be sealed using an approved type of material.
   2. Use galvanized sheet metal sleeves in hollow wall penetrations to provide a backing for the sealant. Grout area around sleeve in masonry construction.
   3. Install escutcheons or floor/ceiling plates where raceway, penetrates non-fire rated surfaces in occupied spaces.
   4. Install rubber links of mechanical seal tightened in place and sized for the pipe, in exterior wall openings below grade, in accordance with the manufacturer's instructions.

3.10 ACCEPTANCE TESTING

A. Grounding and Bonding: Perform inspections and tests as outlined below (NETA ATS, Section 7.13 – Grounding Systems).
   1. Visual and Mechanical Inspection
      a. Verify ground system is in compliance with drawings and specifications.

END OF SECTION

SECTION 26 0533

RACEWAY AND BOXES

PART 1 GENERAL

1.01 SUMMARY

A. Section includes conduit and tubing, surface and buried raceways, wireways, outlet boxes, pull boxes, junction boxes, hand holes and concrete manholes.

1.02 RELATED SECTIONS

A. Section 26 05 26 – Basic Electrical Materials and Methods

B. Section 26 05 19 – 600-Volt Wire and Cables

C. Section 26 05 53 – Electrical Equipment Identification

1.03 REFERENCES - CODES AND STANDARDS

A.	ANSI C80.3	Electrical Metallic Tubing, Zinc Coated.
B.	NECA	(National Electrical Contractor's Association) – "Standard of Installation."
C.	NEMA FB 1	(National Electrical Manufacturers Association) – Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies.
D.	NEMA OS 1	(National Electrical Manufacturers Association) – Sheet-steel Outlet Boxes, Device Boxes, Covers, and Box Supports.
E.	NEMA OS 2	(National Electrical Manufacturers Association) – Nonmetallic Outlet Boxes, Device Boxes, Covers and Box Supports.
F.	NEMA 250	(National Electrical Manufacturers Association) – Enclosures for Electrical Equipment (1,000 Volts Maximum).
G.	NFPA 70	National Electrical Code (NEC). Latest approved edition
H.	UL 1	Flexible Metal Conduit
I.	UL 514B	Conduit, Tubing and Cable Fittings.
J.	UL 797	Electrical Metallic Tubing

1.04 SYSTEM DESCRIPTION

A. Raceway, boxes and manholes located as indicated on drawings and at other locations required for splices, taps, wire pulling, equipment connections, and compliance with regulatory requirements. Raceway and boxes are shown in approximate locations unless dimensioned. Provide raceway to complete wiring system.

B. Provide electrical metallic tubing for sizes less than 2-inches. Provide cast or sheet metal boxes.

1.05 DESIGN REQUIREMENTS

A. Minimum Raceway Size: 3/4 inch (19 mm) unless otherwise specified.

1.06 SUBMITTALS

A. Manufacturer's Installation Instructions: Submit application conditions and limitations of use stipulated by product testing agency having jurisdiction. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

B. Submit detailed conduit routing plan, for review and approval, prior to installation as follows:
   1. Exposed and/or concealed in building walls for conduits larger than 2-inch outside diameter.
   2. All underground conduits (3/4-inch and larger) in duct bank; concealed in floor slabs, equipment pads and concrete slabs.

C. Product Data: Submit for the following:
   1. Electrical Metallic Tubing (EMT).
   2. Flexible metal conduit.
   3. Raceway fittings.
   4. Conduit bodies.
   5. Surface raceway.
   6. Pull boxes and junction boxes.

D. Manufacturer's Installation Instructions:
   1. Submit application conditions and limitations of use stipulated by product testing agency specified under Regulatory Requirements.
   2. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

1.07 CLOSEOUT SUBMITTALS

A. Project Record Documents:
   1. Record actual routing of conduits. Provide record (as-built) drawings marked in red to show actual routing of the underground raceway and cable when different from the original contract drawings. Prepare on new, clean set of contract drawings.
   2. Record actual locations and mounting heights of outlet, pull boxes, junction boxes and manholes.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Protect conduit from corrosion and entrance of debris by storing above grade. Provide appropriate covering.

PART 2 PRODUCTS

2.01 CONDUIT

A. Electrical Metallic Tubing (EMT). Electrical metallic tubing, including elbows and bends, shall be zinc coated, mild steel in accordance with the requirements of ANSI C80.3 and UL 797. The interior and exterior surfaces of the tubing shall have a continuous zinc

coating. Conduit shall be formed with a continuous welded seam, with a uniform wall thickness, in minimum 10-foot lengths.

B. Flexible Metal Conduit shall be galvanized steel meeting the requirements of UL 1. Flexible aluminum conduit is not permitted.

2.02 RACEWAY FITTINGS

A. Liquid-Tight Flexible Metal Conduit Fittings shall be galvanized steel similar to T&B “Tite-Bite”.

B. Special Fittings. Conduit sealing, explosion proof, dust proof, and other types of special fittings shall be provided as required and shall be consistent with the area and equipment with which they are associated. Fittings installed outdoors or in damp locations shall be sealed and gasketed. Outdoor fittings shall be of heavy cast construction. Hazardous area fittings and conduit sealing shall conform to NEC requirements for the area classification.

C. Bushings shall be provided for the termination of all conduits not terminated in hubs, couplings or insulated throat connectors. Grounding type insulated bushings with insulating inserts in metal housings shall be provided for conduit 1-1/4 inches and larger. Standard bushings shall be galvanized steel or malleable iron in all sizes.

D. Locknuts. One interior and one exterior locknut shall be provided for all conduit terminations not provided with threaded hubs and couplings. Locknuts shall be designed to securely bond with the conduit to the box when tightened. Locknuts shall be so constructed that they will not be loosened by vibration.

2.03 CONDUIT BODIES

A. All conduit bodies shall be equipped with a sealed and gasketed cover. Cover shall be secured using stainless steel machine screws.

2.04 CONDUIT SUPPORTS

A. Conduit supports shall be furnished and installed in accordance with other section of these specifications. Conduits shall be supported so that fittings are accessible. Support systems shall be limited to electrical conduits only.

B. Hanger rods shall be 3/8-inch diameter galvanized threaded steel rods, minimum.

C. Conduit Clamps. Conduits in single runs or groups of two shall be supported by steel clamps and clamp backs. They shall be galvanized malleable iron or approved equal cast ferrous metal for steel conduit or tubing.

D. Support Channels. Supports for banks of three of more conduits shall be constructed of formed steel support channels (Unistrut, Kindorf, Superstrut, B-Line or approved equal) with associated conduit or tubing clips. Support channels shall be steel, hot-dip galvanized after fabrication with galvanized steel clips for steel conduit or tubing.

E. Wall Penetrations. All conduits, raceways, cables and sleeve penetrations through fire rated and hazardous location walls, shafts, floor, ceilings, etc., shall be sealed with a UL-approved fire stopping system, in accordance with specification Section 26 05 26 – Basic Electrical Materials and Methods.

2.05 OUTLET BOXES AND SWITCH BOXES

A. Manufacturers: Firms regularly engaged in the manufacturing of electrical raceways of the types and capacities required, whose products have been in satisfactory use in similar service for not less than 3 years.

B. Sheet Metal Outlet Boxes: ANSI/NEMA OS 1, galvanized flat rolled sheet steel outlet wiring boxes of types, shapes and sizes, including box depths, to suit each respective location and installation; construct with stamped knockouts in back and sides, and with threaded screw holes with corrosion-resistant screws for securing box covers and wiring devices.

C. Luminaire and Equipment Supporting Boxes: Rated for weight of equipment supported, per NEC requirements.

D. Outlet Box Accessories: Provide outlet box accessories as required for each installation, including mounting brackets, wallboard hangers, extension rings, fixture studs, cable clamps and metal straps for supporting outlet boxes, which are compatible with outlet boxes being used and meeting requirements of individual wiring situations.

2.06 PULL BOXES AND JUNCTION BOXES

A. Sheet Metal Boxes shall be NEMA OS 1, NEMA rating as indicated on drawings. Minimum 16 gauge galvanized steel construction with stainless steel hinged cover and neoprene gasket. Cover shall be secured to the body with a continuous, full length, piano type hinge and stainless steel pin on one side and captive screw on the other side. Door shall be equipped with padlock hasp with sealing hole provisions.
   1. Provide #10-32 tapped hole provisions for optional ground lug kit.
   2. Provide 0.375-16 collar studs for mounting optional panel.
   3. Provide external mounting feet for secure wall mounting.
   4. Finish: Wash and phosphate undercoat with ANSI 61 gray polyester power finish.

2.07 CLOSURE FOAM

A. All conduit, raceways, cables and sleeves penetrations through fire rated and hazardous location walls, shafts, floor, ceilings, etc., shall be sealed by closure foam as in Dow Corning #3-6548 silicone RTV, GE RTV 850 silicone foam, or approved equal.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify outlet locations and routing and termination locations of raceway prior to rough in.

3.02 EXISTING WORK

A. Extend existing raceway and box installations using materials and methods compatible with existing electrical installations, or as specified.

B. Clean and repair existing raceway and boxes to remain or to be reinstalled.

3.03 INSTALLATION OF RACEWAYS

A. Routing

1. Install raceway and boxes in accordance with NECA “Standard of Installation.”
2. Conduit routing shown on drawings is diagrammatic only. Contractor shall field route conduit and raceways between equipment and devices as required to obtain a complete wiring system.
3. All exposed conduits shall be installed parallel or perpendicular to dominant surfaces with right-angle turns made of symmetrical bends or fittings.
4. Conduit shall not be installed on the outside face of exposed columns, but shall be routed on the web or on the inside of a flange of the column.
5. Except where prevented by the location of other work, a single conduit or a conduit group shall be centered on structural members.
6. Conduit shall be located at least 6 inches from hot water or steam pipes and from other hot surfaces

B. Moisture Pockets
1. Moisture pockets shall be eliminated from conduits. If water cannot drain to the natural opening in the conduit system, a hole shall be drilled in the bottom of a pull box or a "C-type" conduit fitting provided in the low point of the conduit run.

C. Conduit Bodies
1. Conduit bends shall meet the requirements of NEC, minimum bend radius of the cable installed or as indicated on the drawings, whichever is greater.
2. Conduits or tubing deformed or crushed in any way shall be removed from the job site.

D. Bends and Offsets
1. Changes in direction of conduits shall be made with fittings or bends.
2. Conduit bends shall meet the requirements of NEC, minimum bend radius of the cable installed or as indicated on the drawings, whichever is greater.
3. Bends shall be made using appropriate tools or mechanical equipment. The use of a pipe tee or vise for bending conduit or tubing will not be permitted.
4. Conduits or tubing deformed or crushed in any way shall be removed from the job site.
5. Install no more than the equivalent of three 90 degree bends between boxes or outlets

E. Cutting and Threading
1. The plane of all conduit ends shall be square with the centerline.
2. The ends of all conduit and tubing shall be reamed to remove all rough edges and burrs.

F. All steel conduit, exposed to weather or in contact with earth, shall be re-galvanized after threading with "Galvanizing Powder M-321" as manufactured by the American Solder and Flux Company of Philadelphia, Pennsylvania; "Zincilate 810" as manufactured by Industrial Metal Protectives, Inc., of Dayton, Ohio; "Zinc Rich" coating as manufactured by ZRC Chemical Products Company, Quincy, Massachusetts; or approved equal. The Contractor shall supply this protective material and shall apply it in the field.

G. Connections to Boxes and Cabinets
1. Conduit shall be securely fastened to all boxes and cabinets.
2. Threads on metallic conduit connectors shall project through the wall of the box to allow the bushing to butt against the end of the conduit.
3. The locknuts, both inside and outside, shall then be tightened sufficiently to bond the conduit securely to the box.
4. Locknuts on connectors shall be tightened securely to bond the connectors.

H. All conduits entering enclosures outdoors or in wet areas shall enter through Meyer's hubs, or approved equal, or threaded openings.

I. Cleaning
   1. Precautions shall be taken to prevent the accumulation of water, dirt, or concrete in the conduit.
   2. Conduit in which water or other foreign materials have been permitted to accumulate shall be thoroughly cleaned or, where such accumulation cannot be removed by methods acceptable to the Owner /Engineer, the conduit shall be replaced.
   3. For conduits sizes 3 inches and larger, draw a flexible testing mandrel approximately 12 inches long with a diameter less than the inside diameter of the conduit through the conduit. After which, draw a stiff bristle brush through until conduit is clear of particles of foreign materials. For conduits less than 3 inches, draw a stiff bristle brush through until conduit is clear of particles and foreign material.

J. Empty Conduit
   1. All conduits installed for future use shall have a polypropylene pull line with a minimum tensile strength of 200 lbs., Jet Line, Cat. No. 232, polyolefin, or approved equal. Pull line shall be secures at both ends to ensure future accessibility.

K. Identification
   1. All conduits shall be identified in accordance with other section of these specifications.

L. Grounding
   1. All conduits shall be grounded in accordance with specification Section 26 05 26 – Basic Electrical Materials and Methods.
   2. A solid or stranded bare copper or green insulated copper solid or stranded ground wire shall be provided in all conduits and raceways.

M. Electrical Metallic Tubing
   1. Electrical metallic tubing shall be installed for all circuits, indoors above concrete slab, where not subject to conditions outlined for rigid galvanized steel conduits.

N. Flexible Metal Conduit, Steel or Aluminum
   1. Flexible conduit inserts not greater than 30 inches in length, shall be installed in all conduit runs, which are supported by both building steel and by structures subject to vibration or thermal expansion. This shall include locations where conduit supported by building steel enters or becomes supported by isolated structures on separate foundations.
   2. Flexible conduit shall be installed in conduit runs, which cross expansion joints.
   3. Special areas, such as plant office control rooms in which external noise is to be minimized, shall have flexible conduit in conduit runs where the runs cross from the main building framing to the control room or office framing.
   4. Flexible conduit shall be installed adjacent to all equipment and devices, which move in relation to the supply conduit due to vibration, normal operation of the mechanism, or thermal expansion.
   5. Conduit shall be connected to pressure switches, thermocouples, solenoids, and similar devices with flexible conduit. Flexible conduit shall be installed adjacent to the motor terminal housing for motors requiring 4-inch and smaller conduit.
   6. Flexible metal conduit inserts not greater than 6 feet in length shall be installed for light fixture tap conductors.

O. Conduit Support
   1. Fasten conduit supports to building structures and surfaces in accordance with Section 26 05 26 – Basic Electrical Materials and Methods.
   2. Support raceway using coated steel or malleable iron straps, lay-in adjustable hangers, clevis hangers, and split hangers.
   3. Do not use wire, ceiling support wires or perforated pipe straps to support conduit. Remove any temporary installation support wire.

P. Spacing of Supports
   1. All conduit runs shall be rigidly supported, except where buried in concrete,.
   2. Each conduit shall be supported within one (1) foot of junction boxes and fittings.
   3. Spacers used in duct bank installations shall be placed no more than 6 to 10 feet apart.
   4. Support spacing along conduit runs shall be as follows.

CONDUIT SIZE	MAXIMUM DISTANCE BETWEEN SUPPORTS
½ inch through 1-1/4 inch	5 feet
1-1/2 inch and larger	8 feet

Q. Ground and bond raceway and boxes in accordance with Section 26 05 26 – Basic Electrical Materials and Methods.

3.04 CABINET AND BOX INSTALLATION

A. Install electrical boxes as shown on drawings, and as required for splices, taps, wire pulling, equipment connections and compliance with regulatory requirements.

B. Locate boxes and conduit bodies so as to ensure ready accessibility of electrical wiring, maintain headroom and to present neat mechanical appearance.

C. Install pull boxes and junction boxes above accessible ceilings and in unfinished areas only. In inaccessible ceiling areas, install outlet and junction boxes no more than 6 inches from ceiling access panel or from removable recessed luminaire.

D. Align adjacent wall mounted outlet boxes for switches, thermostats, and similar devices with each other.

E. Use flush mounting outlet boxes in finished areas.
   1. Do not install flush mounting boxes back-to-back in walls.
   2. Provide minimum 6-inch separation between adjacent boxes.
   3. Provide minimum 24-inch separation in acoustic rated walls.
   4. Use stamped steel bridges to fasten flush mounting outlet box between studs.
   5. Secure flush mounting box to interior wall and partition studs.
   6. Accurately position to allow for surface finish thickness.
   7. Install flush mounting box without damaging wall insulation or reducing its effectiveness.
   8. Use adjustable steel channel fasteners for hung ceiling outlet box.

F. Support boxes independently of conduits.

G. Use code sized gang box where more than one device is mounted together. Do not use sectional box. Use code sized gang box with plaster ring for single device outlets.

H. Coordinate installation of electrical boxes and fittings with cable and raceway installation work. Provide knockout closures to cap unused knockout holes where blanks have been removed.

I. Avoid using round boxes where conduit must enter box through side of box, which would result in difficult and insecure connections where fastened with a locknut or bushing on rounded surface.

J. Fasten boxes rigidly to substrate or structural surfaces to which they are being mounted, or solidly embed electrical boxes in concrete or masonry as appropriate.

K. Except as prevented by the location of other work, all junction boxes and outlet boxes shall be centered on structures.

L. Conduit openings in boxes shall be made with a hole saw or shall be punched.

M. Cabinets and boxes shall be rigidly mounted.
1. Mounting on concrete shall be secured by self-drilling anchors.
2. Mounting on steel shall be by drilled and tapped screw holes, or by special support channels welded to the steel, or by both.
3. Cabinets shall be leveled and fastened to the mounting surface with not less than ¼-inch air space between the enclosure and mounting surface.
4. All mounting holes in the enclosure shall be used.

N. Large Pull Boxes - Boxes larger than 100 cubic inches in volume or 12 inches in any dimension.
1. Interior Dry Locations - Use hinged enclosure.

3.05 ANCHORS

A. Where supports for raceways, boxes, and cabinets are mounted on concrete surfaces, they shall be fastened with self-drilling tubular expansion shell anchors with externally split expansion shells, single-cone expanders, and annular break-off grooved chucking cones. Anchors shall be Phillips "Red Head" or approved equal.

3.06 ADJUSTING

A. Install knockout closures in unused openings in boxes.

3.07 CLEANING

A. Clean interior of boxes to remove dust, debris, and other material.

B. Clean exposed surfaces and restore manufacturer’s finish.

END OF SECTION

SECTION 26 0553

ELECTRICAL EQUIPMENT IDENTIFICATION

PART 1 GENERAL

1.01 SUMMARY

A. The extent of the electrical systems and equipment requiring identification is shown on the drawings, and the extent of identification required is specified herein and in individual sections of work requiring identification. The types of electrical identification specified in this section include the following:
   1. Equipment/system identification signs.

1.02 REFERENCES - CODES AND STANDARDS

A. NFPA 70 National Electrical Code (NEC). Latest approved edition.

1.03 SYSTEM DESCRIPTION

A. Identify all electrical equipment as stated below:
   1. Identify all receptacles and lighting switches by the circuit number using ¼-inch high white characters on ½-inch wide black stick-on tape.
   2. All branch circuits in outlet boxes shall be identified with circuit number using wrap-around labels (T&B, BRADY or 3M).
   3. Panelboard Directories: Furnish all panelboards with a complete 8-1/2-inch by 11-inch typewritten directory mounted in the inner door under a clear plastic cover set in a metal frame.

1.04 SUBMITTALS

A. Catalog data for nameplates, labels, and markers.

B. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by Product testing agency specified under regulatory requirements. Include instructions for storage, handling, protection, examination, preparation and installation of Product.

1.05 REGULATORY REQUIREMENTS

A. Conform to requirements of NFPA 70 – National Electrical Code.

B. Furnish products listed and classified by Underwriters' Laboratories, Inc. (UL), Electrical Testing Laboratories, Inc. (ETL), or other recognized, approved testing and listing agencies as suitable for the purpose specified and shown.

PART 2 PRODUCTS

2.01 NAMEPLATES AND LABELS

A. Nameplates
   1. Engraved three-layer laminated plastic, white letters on black background for normal power and white letters on red background for emergency power.

Communications and control cabinets shall be labeled with white letters on green background.

2. Locations
   a. Each electrical distribution and control equipment enclosure.
   b. Communication cabinets.
3. Letter Size
   a. Use 1/8-inch letters for identifying individual equipment and loads.
   b. Use ¼-inch letters for identifying grouped equipment, loads, panelboards, and transfer switch.

B. Labels
1. Embossed adhesive tape, with 3/16-inch black letters on clear background. Use only for identification of individual wall switches and receptacles, control device stations, and multi-outlet devices.
2. Thickness
   a. 1/16-inch for units up to 20 square inches or 8-inch length; 1/8-inch for larger units.

2.02 WIRE MARKERS

A. Manufacturers
1. Brady
2. Thomas & Betts
3. 3-M Co.

B. Description: Cloth, tape, split sleeve, or tubing type wire markers, self-adhesive.

C. Locations: Each conductor at panelboard gutters, pull boxes, outlet and junction boxes, control panels, motor controllers and starters, and each load connection.

D. Legend
1. Power and Lighting Circuits: Branch circuit or feeder number indicated on contract drawings.
2. Control Circuits: Control wire number indicated on shop drawings.
3. Neutral Conductors: Clearly indicate the branch circuit or feeder number the neutral serves. In multi-wire circuits where the neutral is shared, mark the neutral with the circuit number of the “A” phase.

2.03 FASTENERS

A. Secure all labels and nameplates with self-tapping stainless steel screws. Use contact type permanent adhesive where screws cannot or should not penetrate the substrate.

2.04 LETTERING AND GRAPHICS

A. Coordinate names, abbreviations and other designations used in the electrical identification work, with the corresponding designations shown, specified or scheduled. Provide numbers, lettering and wording as indicated or, if not otherwise indicated, as recommended by manufacturers or as required for proper identification and operation/maintenance of the electrical systems and equipment.

PART 3 EXECUTION

3.01 PREPARATION

A. Degrease and clean surfaces to receive nameplates and labels.

B. Coordination: Where identification is to be applied to surfaces that require finish, install identification after completion of painting.

C. Regulations: Comply with governing regulations and the requests of governing authorities for the identification of electrical work.

3.02 APPLICATION

A. Install nameplate and label parallel to equipment lines.

B. Secure nameplate to equipment front using screws, rivets, or adhesive.

C. Secure nameplate to outside moveable surface of door on panelboard.

D. Cable/Conductor Identification:
   1. Apply cable/conductor identification on each cable and conductor in each box/enclosure/cabinet where the wires of more than one circuit or communication/signal system are present, except where another form of identification (such as color-coded conductors) is provided.
   2. Match identification with marking system used in panelboards, shop drawings, contract documents, and similar previously established identification for project electrical work.

E. Equipment/System Identification Signs
   1. Install an engraved plastic-laminate sign on each major unit of electrical equipment in the building; including the central or master unit of each electrical system and the communication/signal systems, unless the unit is specified with its own self-explanatory identification or signal system.
   2. Except as otherwise indicated or specified, provide single line of test, ½-inch high lettering on 1-1/2-inch high sign (2-inch high where two lines are required), white lettering in black field.
   3. Provide text matching terminology and numbering of the contract documents and shop drawings.

END OF SECTION

SECTION 26 0923

LIGHTING CONTROL DEVICES

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Remote control lighting relays.
   2. Switches.
   3. Occupancy sensors.
   4. Photocells.
   5. Photocell control unit.

1.02 SYSTEM DESCRIPTION

A. Distributed switching control using self contained individually mounted lighting relays.

1.03 SUBMITTALS

A. Shop Drawings: Indicate dimensioned drawings of lighting control system components and accessories.
   1. One Line Diagram: Indicating system configuration indicating panels, number and type of switches or devices.
   2. Include typical wiring diagrams for each component.

B. Product Data: Submit manufacturer’s standard product data for each system component.

C. Manufacturer's Installation Instructions: Submit for each system component.

D. Manufacturer's Certificate: Certify Products meet or exceed specified requirements for Title 24.

1.04 CLOSEOUT SUBMITTALS

A. Project Record Documents: Record the following information:
   1. Actual locations of components and record circuiting and switching arrangements.
   2. Wiring diagrams reflecting field installed conditions with identified and numbered, system components and devices.

B. Operation and Maintenance Data:
   1. Submit replacement parts numbers.
   2. Submit manufacturer’s published installation instructions and operating instructions.
   3. Recommended renewal parts list.

1.05 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Accept components on site in manufacturer's packaging. Inspect for damage.

B. Protect components by storing in manufacturer's containers indoor protected from weather.

PART 2 PRODUCTS

2.01 ROOM CONTROLLER SYSTEM

A. Manufacturers:
   1. Cooper Greengate.
   2. WattStopper.

B. Room Controller: 2-relay, 0-10V dimming room controller, suitable for 120/277V operation.
   1. Greengate RC3D2E
   2. WattStopper LMRC-212

C. Occupancy Sensor: Dual technology, wall/ceiling mount
   1. Greengate OAWC-DT-120W
   2. WattStopper

D. Daylight Sensor
   1. Greengate DS-FMOIR
   2. WattStopper LMLS-400

E. Wall Station: On/off with dimming control.
   1. Greengate RC-5TSB-OS2
   2. WattStopper LMDM-101

F. Plug Load Controller: Rated for 20 amps at 120 volts.
   1. Greengate SPRC-R-20-120
   2. WattStopper LMPL-101

G. Interconnect Cables: #24 AWG, Category 5e, terminated with RJ45 connectors, length to suit lighting system component layout.

H. Miscellaneous Accessories: As required for a fully-functioning, Title 24 compliant system.

PART 3 EXECUTION

3.01 INSTALLATION

A. Mount switches, occupancy sensors, and photocells as indicated on Drawings.

B. Use only properly color coded, stranded wire. Install wire sizes as indicated on Drawings.

C. Mount relays as indicated on Drawings. Wire numbered relays in panel to control power to each load. Install relays to be accessible. Allow space around relays for ventilation and circulation of air.

D. Identify power wiring with circuit breaker number controlling load. When multiple circuit breaker panels are feeding into relay panel, label wires to indicate originating panel designation.

E. Label each low voltage wire with relay number at each switch or sensor.

3.02 ADJUSTING

A. Test each system component after installation to verify proper operation.

B. Test relays and switches after installation to confirm proper operation.

C. Confirm correct loads are recorded on directory card in each panel.

3.03 DEMONSTRATION

A. Demonstrate operation of the following system components:
1. Operation of switches. Demonstrate for all zones.
2. Operation of each type of occupancy sensors. Demonstrate for all zones.
3. Operation of each type of photocell. Demonstrate for all zones.

B. Furnish 4 hours to instruct Owner's personnel in operation and maintenance of system. Schedule training with Owner, provide at least 7 days notice to Architect/Engineer of training date.

END OF SECTION

SECTION 26 2416

PANELBOARDS

PART 1 GENERAL

1.01 SUMMARY

A. Section includes distribution and branch circuit panelboards, and load centers.

B. Related Sections:
1. Section 26 05 26 - Grounding and Bonding for Electrical Systems.
2. Section 26 05 53 - Identification for Electrical Systems.

1.02 REFERENCES

A. Institute of Electrical and Electronics Engineers:
1. IEEE C62.41 - Recommended Practice on Surge Voltages in Low-Voltage AC Power Circuits.

B. National Electrical Manufacturers Association:
1. NEMA AB 1 - Molded Case Circuit Breakers and Molded Case Switches.
2. NEMA FU 1 - Low Voltage Cartridge Fuses.
3. NEMA ICS 2 - Industrial Control and Systems: Controllers, Contactors, and Overload Relays, Rated Not More Than 2000 Volts AC or 750 Volts DC.
4. NEMA ICS 5 - Industrial Control and Systems: Control Circuit and Pilot Devices.
5. NEMA KS 1 - Enclosed and Miscellaneous Distribution Equipment Switches (600 Volts Maximum).
6. NEMA PB 1 - Panelboards.
7. NEMA PB 1.1 - General Instructions for Proper Installation, Operation, and Maintenance of Panelboards Rated 600 Volts or Less.

C. International Electrical Testing Association:
1. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.

D. National Fire Protection Association:
1. NFPA 70 - National Electrical Code.

E. Underwriters Laboratories Inc.:
1. UL 67 - Safety for Panelboards.

1.03 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

B. Shop Drawings: Indicate outline and support point dimensions, voltage, main bus ampacity, integrated short circuit ampere rating, circuit breaker and fusible switch arrangement and sizes.

C. Product Data: Submit catalog data showing specified features of standard products.

1.04 CLOSEOUT SUBMITTALS

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for submittals.

B. Project Record Documents: Record actual locations of panelboards and record actual circuiting arrangements.

C. Operation and Maintenance Data: Submit spare parts listing; source and current prices of replacement parts and supplies; and recommended maintenance procedures and intervals.

1.05 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years [documented] experience.

1.06 MAINTENANCE MATERIALS

A. Section [01 70 00 - Execution and Closeout Requirements]: Requirements for maintenance products.

B. Furnish two of each panelboard key. Panelboards keyed alike.

PART 2 PRODUCTS

2.01 BRANCH CIRCUIT PANELBOARDS

A. Product Description: NEMA PB1, circuit breaker type, lighting and appliance branch circuit panelboard.

B. Panelboard Bus: Copper, current carrying components, ratings as indicated on Drawings. Furnish copper ground bus in each panelboard.

C. For non-linear load applications subject to harmonics furnish 200 percent rated, plated copper, solid neutral.

D. Minimum Integrated Short Circuit Rating: 10,000 amperes rms symmetrical for 240 volt panelboards; 14,000 amperes rms symmetrical for 480 volt panelboards, or as indicated on Drawings.

E. Molded Case Circuit Breakers: NEMA AB 1, bolt-on type thermal magnetic trip circuit breakers, with common trip handle for all poles, listed as Type SWD for lighting circuits, Type HACR for air conditioning equipment circuits, Class A ground fault interrupter circuit breakers as indicated on Drawings. Do not use tandem circuit breakers.

F. Enclosure: NEMA PB 1, Type 1.

G. Cabinet Box: 6 inches deep, 20 inches inches wide for 240 volt and less panelboards.

H. Cabinet Front: Flush cabinet front with concealed trim clamps, concealed hinge, metal directory frame, and flush lock keyed alike. Finish in manufacturer's standard gray enamel.

PART 3 EXECUTION

3.01 EXISTING WORK

A. Disconnect abandoned panelboards.

B. Maintain access to existing panelboard [and load centers] remaining active and requiring access. Modify installation or provide access panel.

C. Clean and repair existing panelboards [and load centers] to remain or to be reinstalled.

3.02 INSTALLATION

A. Install panelboards in accordance with NEMA PB 1.1.

B. Install panelboards plumb.

C. Install recessed panelboards flush with wall finishes.

D. Install filler plates for unused spaces in panelboards.

E. Provide typed circuit directory for each branch circuit panelboard. Revise directory to reflect circuiting changes to balance phase loads.

F. Install engraved plastic nameplates in accordance with Section 26 05 53.

G. Ground and bond panelboard enclosure according to Section 26 05 26. Connect equipment ground bars of panels in accordance with NFPA 70.

3.03 FIELD QUALITY CONTROL

A. Inspect and test in accordance with NETA ATS, except Section 4.

B. Perform circuit breaker inspections and tests listed in NETA ATS, Section 7.6.

C. Perform switch inspections and tests listed in NETA ATS, Section 7.5.

D. Perform controller inspections and tests listed in NETA ATS, Section 7.16.1.

END OF SECTION

SECTION 26 2726

WIRING DEVICES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Wiring devices are defined as single discrete units of electrical distribution systems that are intended to carry but not utilize electric energy. The types of general purpose wiring devices required for the project include, but are not limited to the following line voltage devices:
   1. Connectors
   2. Plugs
   3. Receptacles
   4. Switches
   5. Wall plates

1.02 RELATED SECTIONS

A. Section 26 05 00 – Basic Electrical Materials and Methods

B. Section 26 05 19 – 600-Volt Wires and Cables

C. Section 26 05 53 – Electrical Equipment Identification

1.03 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. IEC 529 Degrees of Protection provided by Enclosures.

B. NEMA WD 1 General Purpose Wiring Devices

C. NEMA WD 6 Wiring Device Configurations.

1.04 CONTRACTOR SUBMITTALS

A. Product Information:
   1. Catalog cut of each device showing Manufacturer name, catalog number, voltage and current rating and dimensions.

1.05 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum five (5) years experience.

B. Installer: A firm with at least five (5) years of successful installation experience on projects with electrical installation work similar to that required for the project.

1.06 REGULATORY REQUIREMENTS

A. Furnish products listed and classified by Underwriters Laboratories, Inc. (UL), Electrical Testing Laboratories, Inc. (ETL), or other recognized, acceptable testing and listing agencies as suitable for the purpose specified and shown.

PART 2 PRODUCTS

2.01 GENERAL

A. Provide factory fabricated wiring devices in the type, color, electrical rating for service indicated, and/or as shown on the drawings.

2.02 RECEPTACLES

A. Provide specification grade, grounding type, heavy-duty receptacles with ivory plastic body, green hexagonal equipment ground screw terminal and grounding poles internally connected to mounting yoke; metal plaster ears; side wiring NEMA WD-6 as follows:
   1. Duplex Receptacle: Two pole, 3 wire, 20-ampere, 125-volt duplex receptacle, NEMA configuration 5-20R unless otherwise indicated.
   2. GFCI Receptacle: Two pole, 3 wire, 20-ampere, 125-volt duplex receptacle with integral ground fault circuit interrupter to meet regulatory requirements.
   3. Special Purpose Receptacle: Type as required meeting the requirements of this Section and the equipment shown on the drawings and elsewhere specified.

2.03 DATA RECEPTACLES

A. Provide single-gang wallplate with two RJ-45 jacks, Leviton Quickport, or equal.

2.04 PLUGS AND CONNECTORS

A. Comply with NEMA Standards Publication No. WD-1. Provide 20 ampere, 125-volts, bakelite body connectors, 3-wire grounding, parallel blades, double wipe contact, with cord clamp.

B. Matching Insulgrip, corrosion resistant nylon plugs, IP20, shall be provided for each twist-lock type receptacles unless indicated otherwise.

C. Manufacturers: Hubbell, Pass & Seymour, Bryant.

2.05 WALL PLATES

A. Decorative Cover Plate: High impact, smooth nylon and smooth satin in finished areas. Color of nylon cover plate shall be ivory unless noted otherwise. Stainless steel cover plate in unfinished areas or where device is embedded in concrete.

B. For areas where receptacles are switched, each type of receptacle (switched, non-switched) shall have a different color cover plate such as black, gray, or brown.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify outlet boxes are installed at proper height.

B. Verify wall openings are neatly cut and will be completely covered by wall plates.

C. Verify branch circuit wiring installation is completed, tested, and ready for connection to wiring devices.

D. Inspect each item of materials or equipment immediately prior to installation, and reject damaged and defective items.

3.02 PREPARATION

A. Provide extension rings to bring outlet boxes flush with finished surface, if necessary.

B. Clean debris from all boxes.

3.03 INSTALLATION

A. Install wiring devices where indicated, in accordance with the manufacturer's written instructions, the applicable requirements of the NEC and the NECA "Standard of Installation", and in accordance with recognized industry practices to ensure that products serve the intended function.

B. Comply with the manufacturer's applicable instructions and recommendations for installation, to whatever extent these are more explicit or more stringent than applicable requirements indicated in the contract documents.
   1. Install devices plumb and level. Install switches with OFF position down
   2. Install vertically oriented grounded receptacles with grounding pole on top
   3. Connect wiring device grounding terminal to equipment grounding conductor as specified in Section 16050 – Basic Materials and Methods.
   4. Connect isolated ground (IG) receptacle equipment (yoke) grounding terminal only at metallic box with bonding jumper
   5. Install decorative plates on switch, receptacle, and blank outlets in finished areas
   6. Install galvanized steel plates on outlet boxes and junction boxes in unfinished areas, above accessible ceilings, and on surface mounted outlets in utility areas. (Does not include multi-outlet assemblies, other similar locations.).
   7. Identify wiring devices as specified in Section 26 05 53 – Electric Equipment Identification.

3.04 INTERFACE WITH OTHER PRODUCTS

A. Coordinate locations of outlet boxes to obtain mounting heights compliant with ADA.

B. Install wall switch at 42 inches to top of the maximum reach above finished floor for forward reach applications, 48 inches to top of reach for side reach applications. The lower reach shall be at or above 18 inches for forward reach and for side reach, unless otherwise noted.

C. Install convenience receptacle 18 inches to center above finished floor, unless otherwise noted.

D. Install convenience receptacle 6 inches to center above backsplash of counter, unless otherwise noted.

E. Install telephone and/or data jacks 18 inches to center above finished floor, unless otherwise noted.

F. Install telephone jack for wall telephone 42 inches to top of reach above finished floor for forward reach applications, and 48 inches above finished floor to top of reach for side reach applications to comply with the ADA. Receiver hook shall not be above 54 inches to its highest point above finished floor.

3.05 FIELD QUALITY CONTROL

A. Inspect each wiring device for defects.

B. Operate each wall switch with circuit energized and verify proper operation.

C. Verify that each receptacle device is energized.

D. Test each receptacle device for proper polarity.

E. Test each GFCI receptacle device for proper operation.

F. Verify that each telephone and data jack is properly connected and circuit is operational.

3.06 ADJUSTING

A. Adjust devices and wall plates to be flush, plumb and level.

END OF SECTION

SECTION 26 5100

INTERIOR LIGHTING

PART 1 GENERAL

1.01 SUMMARY

A. Section includes interior luminaires, lamps, ballasts, and accessories.

B. Related Sections:
1. Section 26 05 26 - Grounding and Bonding for Electrical Systems.
2. Section 26 05 33 - Raceway and Boxes for Electrical Systems.

1.02 SUBMITTALS

A. Shop Drawings: Indicate dimensions and components for each luminaire not standard product of manufacturer.

B. Product Data: Submit dimensions, ratings, and performance data.

1.03 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years [documented] experience.

PART 2 PRODUCTS

2.01 INTERIOR LUMINAIRES

A. Product Description: Complete interior luminaire assemblies, with features, options, and accessories as scheduled.

PART 3 EXECUTION

3.01 EXISTING WORK

A. Disconnect and remove abandoned luminaires, lamps, and accessories.

B. Extend existing interior luminaire installations using materials and methods [compatible with existing installations, or] as specified.

C. Clean and repair existing interior luminaires to remain or to be reinstalled.

3.02 INSTALLATION

A. Install suspended luminaires using pendants supported from swivel hangers. Install pendant length required to suspend luminaire at indicated height.

B. Support luminaires larger than 2 x 4 foot size independent of ceiling framing.

C. Locate recessed ceiling luminaires as indicated on Drawings.

D. Install surface mounted luminaires plumb and adjust to align with building lines and with each other. Secure to prevent movement.

E. Install clips to secure recessed grid-supported luminaires in place.

F. Install accessories furnished with each luminaire.

G. Make wiring connections to branch circuit using building wire with insulation suitable for temperature conditions within luminaire.

H. Ground and bond interior luminaires in accordance with Section 26 05 26.

3.03 FIELD QUALITY CONTROL

A. Operate each luminaire after installation and connection. Inspect for proper connection and operation.

3.04 CLEANING

A. Remove dirt and debris from enclosures.

B. Clean photometric control surfaces as recommended by manufacturer.

C. Clean finishes and touch up damage.

END OF SECTION

SECTION 13
WATER POLLUTION CONTROL

13-1 General

13-1.01A: Water Pollution Control shall be performed in accordance with Section 13, Water Pollution Control, of the Standard Specifications and these technical specifications. In addition, construction activities shall comply with:

1. The California Water Quality Control Board, North Coast Region Order No. R1-2009-0050, National Pollutant Discharge Elimination System Municipal Storm Water Permit, Part 8 – Development Construction Program, Sections 1 through 5, commonly referred to as the "Storm Water Permit". A copy of the Storm Water Permit is available for review at the City of Santa Rosa Transportation and Public Works Department, 69 Stony Circle, Santa Rosa, CA, and at www.srcity.org/stormwaterpermit.
2. The California Stormwater Quality Association Storm Water BMP Handbook for Construction (CASQA Handbook). BMPs shall be selected, installed and maintained in accordance with the latest edition. A copy of the handbook can be viewed at the City of Santa Rosa Department of Transportation and Public Works office at 69 Stony Circle or downloaded from CASQA, http://www.casqa.org/.

In this technical specification the CASQA Handbook BMP numbers are appended to the associated Standard Specification sections. If a conflict occurs the CASQA Handbook BMP's shall govern.

13-2 Water Pollution Control Program

13-2.01B Submittals: The program to control water pollution required to be submitted under this section of the Standard Specifications shall include a spill contingency plan that establishes clean-up procedures that will be followed in the event of a spill of potentially hazardous, toxic, or polluting materials.

13-2.04 Payment: Full compensation for conforming to this section shall be considered as included in the prices paid for the various contract items of work and no additional compensation will be allowed.

13-3 Storm Water Pollution Prevention Plan

13-3.01A Summary: This project is exempt from the State Water Resources Control Board General NPDES Permit for the Discharge of Storm Water related to Construction Activities (Construction General Permit), and not required to have a Storm Water Pollution Prevention Plan (SWPPP), therefore Section 13-3, Storm Water Pollution Prevention Plan, of the Standard Specifications does not apply to this project.

13-4 Job Site Management

13-4.03B: Spill Prevention and Control / CASQA Spill Prevention and Control (BMP WM-4):

If a spill occurs at the construction site and the contractor does not take immediate and adequate steps to contain and clean up the spill, especially if rain is threatening or if a discharge to a storm drain or creek could occur, the City shall have the right, in its sole and absolute discretion, to clean up the spill using City forces or an independent contractor. The cost of any such cleanup, in addition to recovery of any penalty or fine imposed upon the City, plus an administrative charge of fifteen percent (15%) of the costs incurred by the City, shall be deducted from any amounts owed to Contractor hereunder.
In the event there are insufficient amounts owed to Contractor hereunder to cover the foregoing costs and charges, the City shall have the right to pursue any other remedy to recover same, including, but not limited to, proceeding against any surety or bond in favor of the City. The City's rights under this section are intended to be in addition to and not in lieu of any imposed by the City against Contractor for violations of City Code Chapter 17-12, "Storm Water".

13-4.03C(2): Material Storage / CASQA Material Delivery and Storage (BMP WM-1)

13-4.03C(3): Stockpile Management / CASQA Stockpile Management (BMP WM-3): Do not block storm water flows.

13-4.03D(1): Waste Management / CASQA Solid Waste Management (BMP WM- 5): The Contractor shall dispose of all trash, rubbish, and waste materials of any kind generated by the contractor, subcontractor, or any company hired by the Contractor on a daily basis.

13-4.03D(3): Concrete Waste / CASQA Concrete Waste Management (BMP WM-8): Ensure the containment of concrete washout areas and other washout areas that may contain pollutants so there is no discharge into the underlying soil and onto the surrounding areas.

13-4.03D(4): Sanitary and Septic Waste / CASQA Sanitary and Septic Waste Management (BMP WM-9): Sanitation facilities must be maintained periodically by a licensed service to keep them in good working order and prevent overflows. Portable toilets are required to have secondary containment.

13-4.03D(5): Liquid Waste: Liquid waste includes water generated from excavation dewatering.

Minimize transfer piping by locating containers near the excavation to be dewatered while protecting the contaiiners from moving vehicles and equipment.

13-4.03E(1): Water Control and Conservation / CASQA Water Conservation Practices (BMP NS-1 and NS-2)

13-4.03E(3): Vehicle and Equipment Cleaning / CASQA Vehicle and Equipment Cleaning (BMP NS-8)

13-4.03E(4): Vehicle and Equipment Fueling and Maintenance / CASQA Vehicle and Equipment Fueling (BMP NS-9), and CASQA Vehicle and Equipment Maintenance (BMP NS-10)

13-4.03E(7): Paving, Sealing, Sawcutting, Grooving, and Grinding Activities: As listed in Part 9, sections 4 and 5 of the Storm Water Permit, the following additional BMPs shall be implemented for street paving, repaving, reconstruction, patching, digouts or resurfacing.

1. Restrict paving and repaving activity to exclude periods of rainfall or predicted rainfall unless required by emergency conditions;
2. Install gravel bags and filter fabric or other appropriate inlet protection at all susceptible storm drain inlets and manholes to prevent paving products and tack coat from entering the storm drain;
3. Prevent the discharge of release agents including soybean oil, other oils, or diesel to the storm water drainage system or watercourses;
4. Minimize non-storm water runoff from water use for the roller and for evaporative cooling of the asphalt;
5. Clean equipment over absorbent pads, drip pans, plastic sheeting or other material to capture all spillage and dispose of properly
6. Collect liquid waste in a container, with a secure lid, for transport to a maintenance facility to be reused, recycled, or disposed of properly **13-4.03D(5)**;
7. Collect solid waste by shoveling and vacuuming or sweeping and securing in an appropriate container for transport to a maintenance facility to be reused, recycled, or disposed of properly **13-4.03D(5)**;
8. Cover “cold-mix” asphalt (i.e., pre-mixed aggregate and asphalt binder) with protective sheeting during a rainstorm **13-4.03C(3);**
9. Cover loads with tarp before haul-off to a storage site, ensuring that trucks are not overloaded;
10. Minimize airborne dust by using water spray during grinding **14-9.03** and**;**
11. Avoid stockpiling soil, sand, sediment, asphalt material and asphalt grindings materials or rubble in or near storm water drainage system or watercourses **13-4.03C(1)**,

13-4.03F: Sweeping / CASQA Street Sweeping and Vacuuming (BMP SE-7)

13-4.04 Payment: Full compensation for conforming to this section shall be considered as included in the prices paid for the various contract items of work and no additional compensation will be allowed.

13-6 Temporary Sediment Control

13-6.03C: Temporary Drainage Inlet Protection / CASQA Storm Drain Inlet Protection (BMP SE-10)

13-6.04: Payment: Full compensation for conforming to this section shall be considered as included in the prices paid for the various contract items of work and no additional compensation will be allowed.

13-7 Temporary Tracking Control

13-7.01A: Temporary Tracking Control / Stabilized Construction Entrance and Exit (BMP TC-1), Entrance Outlet Tire Wash (BMP TC-3)

13-7.03 Construction / CASQA Stabilized Construction Site Entrance / Exit (BMP TC-1)

13-7.04 Payment: Full compensation for conforming to this section shall be considered as included in the prices paid for the various contract items of work and no additional compensation will be allowed.

13-10 Temporary Linear Sediment Barrier

13-10 Temporary / CASQA Silt Fence and Sand Bag Barrier (BMP SE-1 and SE-8)

13-10.04 Payment: Full compensation for conforming to this section shall be considered as included in the prices paid for the various contract items of work and no additional compensation will be allowed.

[Revised: 05/18/15CDA STD2010]

SECTION 14
ENVIRONMENTAL STEWARDSHIP

14-9.03 Dust Control

14-9.03A General: Sweeping per section 14-9.03C shall also be performed to prevent and alleviate dust.

Sweeping, covering stockpiles, applying water, and/or dust palliative, to control dust caused by public traffic is not change order work.

14-9.03C Construction: All dust-producing work and unpaved construction sites shall require a minimum watering in the middle and ending of each workday. The frequency of watering shall increase if dust is airborne. Watering shall not produce runoff.

Contractor shall maintain dust control to the satisfaction of the Engineer, 7 days a week, 24 hours per day.

At the end of each work day the Contractor shall thoroughly sweep all streets in the work zone to minimize airborne dust.

At the end of each work week the Contractor shall sweep all streets in the work zone with a commercial street sweeping truck equipped with a rear pick up broom.

At the Engineer's discretion additional sweeping or watering may be required, including the use of a commercial street sweeping truck equipped with a rear pick up broom, at any time or place.

14-9.03D Payment: Full compensation for conforming to this section shall be considered as included in the prices paid for the various contract items of work and no additional compensation will be allowed.

14-10.01 General: The Contractor shall dispose of all portland cement concrete and asphalt concrete, generated from removal or demolition activities on the project, at a recycler for these materials. The Contractor shall provide receipts verifying delivery and approximate quantity (in tons) of the material delivered to a material recycler.

All other excess materials from the project shall become the property of the Contractor and shall be disposed of by him, at his expense.

14-10.02A(1) Submittals: Submit a Solid Waste Disposal and Recycling Report prior to final acceptance of work performed under the Contract. Show the types and amounts of project-generated solid waste taken to or diverted from landfills or reused on the project.

Submit a Solid Waste Disposal and Recycling Report prior to Contract acceptance. Show the types and amounts of project-generated solid waste taken to or diverted from landfills or reused on the project.

14-10.02D Payment: Full compensation for material recycling as specified herein shall be considered as included in the contract prices paid for various items of work, and no additional compensation will be allowed therefor.

[Revised: 05/18/15-DCM STD2010]

26 AGGREGATE BASE

26-1.01 Aggregate Base: Aggregate base shall be Class 2 conforming to and placed in accordance with the requirements of Section 26 of the City Specifications, with the following modifications and additional requirements.

Rolling shall commence immediately after spreading of the damp material and before the material has dried sufficiently to allow separation between the fine and coarse particles.

26-1.02B Quality Requirements: The minimum sand equivalent shall be 31 for any individual test.

26-1.03D Compacting: The surface of the finished aggregate base shall be firm and unyielding. Any visible movement vertically or horizontally of the aggregate base under the action of construction equipment or other maximum legal axle loads shall be considered as evidence that the aggregate base does not meet this requirement.

26-1.04 Payment: Full compensation for conforming to this section shall be considered as included in the prices paid for the various contract items of work and no additional compensation will be allowed.

[Version: 05/03/14 STD2010]

73 CONCRETE CURBS AND SIDEWALKS

73-1.01A Summary: This work shall consist of curbs, gutters, sidewalks, driveways, island paving, curb ramps, and gutter depressions and shall be constructed in accordance with the details and at the location shown on the plans and in conformance to the requirements of Section 73 of the City Specifications, and Standard Specifications.

73-1.01E Color: A colored pigment designed for the integral coloring of concrete shall be added to the concrete mix. The pigment shall contain pure concentrated mineral pigments specifically processed for mixing into concrete and complying with ASTM C979. The colored pigment shall be Davis Colors color #860, applied in a dosage of 1 pound per 94 pound sack of cement (approximately 6 pounds per cubic yard of concrete for a 6 sack mix), or L. M. Scofield color #SG860 applied in a dosage to produce an equivalent color, or an approved equal.

73-2.03 Construction: Curb construction shall be in accordance with Section 73-1.05 of the City Standards. Curb construction shall be in conformance to the details and at the locations shown on the plans and in accordance with City Specifications.

Curb and gutter shall be constructed in conformance to City STD-241, the details and locations shown on the plans and in accordance with the City Specifications.

Curb openings, for driveways, shall be constructed at existing driveways, and at locations indicated on the plans or directed by the Engineer.

All concrete which is to be removed from curb, gutter, and driveway areas shall be removed to the nearest construction joint or as directed by the Engineer.

Median curb per City STD-242 shall be constructed in conformance to the details and at the locations shown on the plans and in accordance with the City Specifications.

Curb and gutter and median curb shall be cured in accordance with the requirements of Section 90-7 of the Standard Specifications except that the Contractor may substitute other than a pigmented sealer upon the approval in writing of such substituted sealer by the Engineer.

All oil, paint, tire marks, and other discoloring shall be removed from the curb and gutter by sandblasting prior to acceptance by the Engineer. Cement mortar will not be an acceptable substitute for sandblasting. Vandalism to uncured concrete surface shall be removed. If it cannot be removed from the surface, then the vandalized concrete shall be removed and replaced to the nearest scoremark.

Curb Ramp shall be constructed in accordance with the details and at the locations shown on the plans per Caltrans Standard plan A88A except the thickness shall be 4” minimum. For purposes of payment, curb ramp will be measured between the outside border of the ramp and landing, and exclude the curb and gutter. The area of concrete beneath the detectable warning surface shall be paid for at the contract price per square foot of curb ramp.

No deduction in measured length of curb and gutter to be paid for will be made for curb openings for driveways.

73-3.03 Curb, Sidewalk, Gutter Depression, Island Paving, Driveway, and Curb Ramp Construction: Curb, sidewalk, gutter depression, island paving, driveway, and curb ramp shall be constructed in accordance with the details and at the location shown on the plans and in conformance to the requirements of Section 73 of the City Specifications with the following modifications and additional requirements.

All concrete which is to be removed from sidewalk and driveway areas shall be removed to the nearest transverse score mark across the full width of sidewalk or construction joint as directed by the Engineer.

Soft or spongy material shall be removed and replaced with suitable material as required by the Engineer.

Sidewalk, driveway, island paving, curb ramp, and gutter depression shall be cured in accordance with the requirements of Section 90-7 of the Standard Specifications except that the Contractor may substitute other than pigmented sealer upon approval in writing of such substituted sealer by the Engineer.

All oil, paint, tire marks, and other discoloring shall be removed from the driveway, island paving, curb ramp, and gutter depression by sandblasting prior to acceptance by the Engineer. Cement mortar will not be an acceptable substitute for sandblasting. Vandalism to uncured concrete surface shall be removed. If it cannot be removed from the surface, then the vandalized concrete shall be removed and replaced to the nearest scoremark.

Curb Ramp shall be constructed in accordance with the details and at the locations shown on the plans per City STD.-232.

Gutter Depression shall be constructed in accordance with the details and at the location shown on the plans and in conformance to the requirements of City STD-243 Standard Valley Gutter.

73-3.04 Payment: Full compensation for conforming to this section shall be considered as included in the prices paid for the various contract items of work and no additional compensation will be allowed.

SECTION A

FEES AND PERMITS

The Contractor shall obtain all necessary and required permits for the project. All permits issued by the City Building Department will be issued at no cost to the Contractor; these fees will be paid by an appropriate City department. All other required permits shall be obtained at the Contractor's expense.

The Contractor shall obtain a building permit prior to construction. The City has arranged for payment of the plan check and permit fees and the permit is available for pick up by the Contractor at City Hall, Community Development Dept, 100 Santa Rosa Avenue, Room 3, after award of the contract by the City of Santa Rosa, reference Permit Number B15-3496. The approved permit shall be issued in Contractor's name. Contractor shall be responsible for complying with all building permit requirements, scheduling all inspections and obtaining final permit sign-offs at the completion of the project. Project retention will not be released to the Contractor until after the final sign-off of the permit by the City.

Full compensation for securing, complying with and the cost of all permits shall be considered as included in the contract prices paid for the various items of work and no additional allowance will be made therefor.

The Contractor shall be fully informed of the requirements of the permits as well as all rules, regulations, and conditions that may govern operations. The Contractor shall conduct operations accordingly and comply with all permits.

[Version: 2/2/15CDA STD2010]

C I T Y O F S A N T A R O S A

STATE OF CALIFORNIA

LAGUNA TREATMENT PLANT MAINTENANCE BUILDING OFFICE EXPANSION

The work to be performed and referred to herein is in the City of Santa Rosa, California and consists of improvements to be constructed in accordance with the provisions of the Invitation for Bids, containing the Notice to Bidders, the Special Provisions, the Project Plan(s), the Bid Forms and the Contract, all of which are by reference incorporated herein, and each Addendum, if any is issued, to any of the above which is also incorporated by reference herein.

TO THE AWARD AUTHORITY OF THE CITY OF SANTA ROSA

The undersigned, as bidder, declares that the only person or parties interested in this bid as principals are those named herein; that this bid is made without collusion with any other person, firm, or corporation; that Contractor has carefully examined the Project Plans, Invitation for Bids and conditions therefor, and is familiar with all bid requirements, that Contractor has examined this Contract and the provisions incorporated by reference herein, and Contractor hereby proposes, and agrees that if its bid is accepted by the City, Contractor will provide all necessary machinery, tools, apparatuses, and other means of construction, and to do all the work and furnish all the materials and services required to complete the construction in accordance with the Contract, the Special Provisions, the Project Plan(s), and Addenda to any of the above as incorporated by reference, in the time stated herein, for the unit prices and/or lump sum prices as follows:

NAME OF BIDDER: _____

CITY OF SANTA ROSA
SCHEDULE OF PRICES
LAGUNA TREATMENT PLANT MAINTENANCE BUILDING OFFICE EXPANSION

Item No.	Description	Quantity	Units	Unit Price	Total Price
1	LAGUNA TREATMENT PLANT MAINTENANCE BUILDING OFFICE EXPANSION	1	LS	$_____	$_____

GRAND TOTAL BID **$_____**

In the case of any discrepancy between the unit price and the total set forth for the item, the unit price shall prevail; provided, however, that if the amount set forth as a unit price is ambiguous, unintelligible or uncertain for any reason, or is omitted, or in the case of lump sum items, is not the same amount as the entry in the "Total" column, then the amount set forth in the "Total" column for the item shall prevail in accordance with the following:

1. As to lump sum items, the amount set forth in the "Total" column shall be the unit price;

2. As to unit basis items, the amount set forth in the "Total" column shall be divided by the estimated quantity for the item and the price thus obtained shall be the unit price.

The Total Base Bid shall be the sum of the "Total" column. In case of discrepancy between the sum of the "Total" column and the amount entered as Total Base Bid, the sum of the "Total" column shall prevail. The bid comparison will be based on the sum of the "Total" column for each bidder.

If this Contract Bid is accepted by the City and the undersigned fails to execute the Contract and to give all the bonds required under the Contract, with a surety satisfactory to the Award Authority of the City of Santa Rosa, within ten calendar days after bidder has received the Notice of Award from the Engineer, then the Award Authority may, at its option, determine that the bidder has abandoned the Contract, and thereupon this bid and the acceptance thereof shall be null and void, and the forfeiture of the security accompanying this bid shall be in accordance with California Public Contract Code section 20172.

The undersigned understands and agrees that the City is not responsible for any error or omissions on the part of the undersigned in making this bid.

The bidder to whom the Contract is awarded agrees to execute the Contract in favor of the City, in the form attached, and to deliver any and all required bond(s) and insurance certificates within ten calendar days from the date of Contractor’s receipt of the Notice of Award. Following the award of the Contract, Contractor shall commence work within ten calendar days from the day authorized in the Notice to Proceed and diligently prosecute the same to completion in accordance with Section 8-1.04.

LIST OF SUBCONTRACTORS

NAME OF BIDDER: _____

The following is a list of each subcontractor who will perform work or labor or render services to the undersigned for the construction of the project in an amount in excess of ½ of 1% of the total amount of this bid.

The undersigned agrees that any portion of the work in excess of ½ of 1% of the total amount of this bid and for which no subcontractor is designated herein will be performed by the undersigned.

SUBCONTRACTOR NAME	SUBCONTRACTOR LICENSE NUMBER	SUBCONTRACTOR DIR REGISTRATION NUMBER	SUBCONTRACTOR BUSINESS ADDRESS	DESCRIPTION OF WORK (ITEM NO.)

LIST OF PREVIOUS SIMILAR JOBS

NAME OF BIDDER: _____

NONCOLLUSION DECLARATION
TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID

The undersigned declares:

I am the _____ of _____, the party making the foregoing bid. The bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation. The bid is genuine and not collusive or sham. The bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid. The bidder has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or to refrain from bidding. The bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the bidder or any other bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other bidder. All statements contained in the bid are true. The bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, to any corporation, partnership, company, association, organization, bid depository, or to any member or agent thereof, to effectuate a collusive or sham bid, and has not paid, and will not pay, any person or entity for such purpose.

Any person executing this declaration on behalf of a bidder that is a corporation, partnership, joint venture, limited liability company, limited liability partnership, or any other entity, hereby represents that he or she has full power to execute, and does execute, this declaration on behalf of the bidder.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct and that this declaration is executed on _____ [date], at _____ [city], _____ [state].

NOTE: The above Noncollusion Declaration is part of the Contract Bid. Signing this Bid on the signature portion thereof shall also constitute signature of this Noncollusion Declaration.

BID BOND AFFIDAVIT AND BIDDER'S SIGNATURE PAGE

Accompanying this bid is a guaranty in the form of (Notice: Insert the words "cash $," "Cashier's Check," "Certified Check," or "Bidder's Bond" as the case may be):

_____

in an amount equal to at least ten percent of the total of this bid.

The undersigned further agrees that if Contractor does not execute the Contract and deliver the necessary bonds to the City within the period of time specified in this Invitation for Bids, the proceeds of the security accompanying this bid shall become the property of the City of Santa Rosa, California, and this bid and the acceptance thereof may, at the option of the City, be considered null and void.

The undersigned is licensed in accordance with an act providing for the registration of Contractors, License No. _____, Class _____, expiration date _____.

The undersigned in registered with the Department of Industrial Relations, Registration No. _____.

IMPORTANT NOTICE: If bidder or other interested person is a corporation, state legal name of corporation, also names of the president, secretary, treasurer, and manager of the corporation; if a partnership, state true name of partnership, also the names of all partners in the partnership; if the bidder is a sole proprietor, state the business name and the proprietor's name in full.

Secretary of State Business Entity Number: _____.

_____

_____

_____

_____

Business Address

_____

Telephone Number

I declare under penalty of perjury that the foregoing is true and correct.

BIDDER'S SIGNATURE: _____

TITLE: _____

DATE: _____

CONTRACT

CITY OF SANTA ROSA

CALIFORNIA

CONTRACT NO. C01889
LAGUNA TREATMENT PLANT MAINTENANCE BUILDING OFFICE EXPANSION

This Contract is made and entered into as of date to be added upon award at Santa Rosa, California, between the City of Santa Rosa (“City") and _____ of _____ ("Contractor").

ARTICLE I - For and in consideration of the payment and agreement hereinafter mentioned, to be made and performed by City, and under the conditions expressed in the required bonds hereunto annexed, Contractor agrees that for the benefit of City, at its own cost and expense, to do all the work and furnish all the materials, except such as are mentioned in the Special Provisions to be furnished by City, necessary to construct and complete the work herein described in a good, workmanlike, and substantial manner. The work embraced herein shall be done in accordance with the Standard Specifications of the State of California Department of Transportation, dated 2010, insofar as the same may apply (Standard Specifications); in accordance with the City of Santa Rosa Construction Specifications for Public Improvements (City Specifications); in accordance with the City of Santa Rosa Design and Construction Standards, (City Standards); in accordance with the State of California Department of Transportation Standard Plans, dated 2010 (Standard Plans), (collectively, “Contract Documents”) and in accordance with the Special Provisions hereinabove set forth, all of which are hereby incorporated into and made part of this Contract.

The work to be performed is further shown upon a plan consisting of 22 sheets entitled, Laguna Treatment Plant Maintenance Building Office Expansion, File Number 2015-0027, approved by the Deputy Director of Transportation and Public Works, hereinafter referred to as the Project Plan(s).

ARTICLE II - Contractor agrees to receive and accept the following prices as full compensation for furnishing all materials and doing all the work contemplated and embraced in this Contract; also for all loss or damages arising out of the nature of the work aforesaid, or from the acts of the elements, or from any unforeseen difficulties or obstructions which may arise or be encountered in the prosecution of the work until its acceptance by City and for all expenses incurred by or in consequence of the suspension or discontinuance of work, and for well and faithfully completing the work, and the whole thereof in the manner and according to the Project Plans and Invitation for Bids therefor, and the requirements of the Engineer under them to wit:

ITEM NUMBER	QUANTITY	DESCRIPTION	UNIT PRICE	TOTAL
			$ _____	$ _____

TOTAL BASE BID (SUM OF "TOTAL" COLUMN) $ _____

BID ITEMS IN THIS SECTION WILL BE INSERTED UPON AWARD OF THE CONTRACT AND SHALL BE THE SAME AS THOSE BID UPON.

ARTICLE III - City and Contractor hereby promise and agree that Contractor shall provide the materials and do the work according to the terms and conditions herein contained and referred to, for the prices aforesaid, and City hereby agrees to pay for the same at the time, in the manner, and upon the conditions set forth; and the parties for themselves, their heirs, executors, administrators, successors, and assigns, do hereby agree to full performance of the covenants herein stated.

ARTICLE IV - By execution of this Contract, Contractor hereby represents and certifies that Contractor is aware of the provisions of Labor Code section 3700 which require every employer to be insured against liability for Workers' Compensation or to undertake self-insurance in accordance with the provisions of that Code, and Contractor hereby agrees to comply with such provisions before commencing the performance of the work of this Contract.

ARTICLE V - It is further expressly agreed by and between the parties hereto that the Invitation for Bids, containing the Notice to Bidders including any required Bonds, the Contract Documents, and any Addenda are all essential parts of this Contract and are specially referred to and by such reference made a part hereof. In the event of any conflict in the provisions thereof, the terms of said documents shall control each over the other, in the following order:

1. Special Provisions
2. Project Plans
3. City Standards
4. City Specifications
5. Standard Specifications
6. Standard Plans

ARTICLE VI - Contractor agrees to commence work pursuant to this Contract within ten calendar days from the date authorized in the Notice to Proceed and to diligently prosecute the same to completion in accordance with Section 8-1.04C of the Special Provisions.

This Contract shall not be transferred or assigned without the prior written consent of City, which may be withheld by City in its sole and absolute discretion.

If Contractor is a corporation, two corporate officers of Contractor, one from each of the following two groups shall execute this Contract: a) the chairman of the board, president or any vice-president; b) the secretary, any assistant secretary, chief financial officer, or any assistant treasurer. The name and title of the corporate officers shall be printed under the signature.

In witness whereof, the parties hereto have executed this Contract as of the date first written above.

City:

City of Santa Rosa,
a Municipal corporation

By: _____

Title: _____

ATTEST:
By: _____

Title: _____

Approved as to form:

By: _____
Office of City Attorney

Contractor:

Name of Contractor,
Type of entity

By: _____

Name: _____

Title: _____

By: _____

Name: _____

Title: _____