FACILTIY PLANNING, CONSTRUCTION, AND
DISTRICT SUPPORT SERVICES
2323 NORTH BROADWAY, RM 112
SANTA ANA, CA 92706

TEL: 714-480-7510

Rancho Santiago Community College District
ATTACHMENT - B

Division 01 RSCCD Specifications
Division 23 Specifcations

Bid #1470
Project Name: VAV Valves Replacements Project

Project Manager: Brad Kirstein

November 01, 2024

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SECTION 01 11 00 SUMMARY OF WORK

PART 1 – GENERAL

SUMMARY

A. The Project consists of replacing valves and controls at reheat coils at numerous VAV locations on four floors of the District Operations Center in Santa Ana.

B. The furnishing of all labor, materials, equipment, services, and incidentals necessary for the VAV Valve Replacement Project at RSCCD District Office building at 2323 North Broadway, Santa Ana, 92706.

1.02 RELATED DOCUMENTS

A. Division 0

B. Construction Services Agreement

C. Drawings

D. Specifications

1.03 USE OF PREMISES

A. Contractor shall sequence, coordinate, and perform the Work to impose minimum impact on the operation and use of the facilities and/or Project site. Contractor shall install all necessary protection for existing improvements, Project site, property, and new Work against dust, dirt, weather, damage, vandalism, and maintain and relocate all protection to accommodate progression of the Work.

B. Contractor shall confine entrance and exiting to the Project site and/or facilities to routes designated by the District Representative.

C. Contractor to coordinate with District Representative to obtain keys. Contractor will be required to sign a release form. Key requests need to be made three (3) days in advance. If Contractor loses a key or fails to return a key to the District, Contractor shall be fined $1,000 for each key lost.

D. Obtain and pay for the use of field offices, storage, work areas, or parking needed for operations or Contractor's employees. Obtain and pay for all public right of way fees associated with utility connections, street use permits and protective canopies over public right of ways.

E. Within existing facilities, District Representative may remove portable equipment, furniture, and supplies from Work areas prior to the start of Work. Contractor shall cover and protect remaining items in areas of the Work.

F. Provide and maintain unimpeded access for police, fire fighting, or rescue equipment.

G. Contractor is advised school related or District related activity may be in session during performance of the Work. Contractor shall utilize all available means to prevent generation of unnecessary noise/vibrations and maintain noise/vibration levels to a minimum. When required by the District Representative, Contractor shall immediately discontinue noise-generating activities and/or provide alternative methods to minimize noise generation. Contractor shall install and maintain air compressors, tractors, cranes, hoists, vehicles, and other internal combustion engine equipment with mufflers, including unloading cycle of compressors. Contractor shall discontinue operation of equipment producing objectionable noise as determined by District Representative and/or District Representative. When applicable, District Representative will provide a testing schedule to indicate when work may not occur.

H. Contractor shall furnish, install, and maintain adequate supports, shoring, and bracing to preserve structural integrity and prevent collapse of existing improvements and/or Work modified and/or altered as part of the Work.

I. Contractor shall secure site, building entrances, exits, and Work areas with locking devices in an acceptable manner to District Representative.

J. Contractor assumes custody and control of Owner property, both fixed and portable, remaining in existing facilities vacated during the Work.

K. Contractor shall cover, maintain, and protect surfaces of rooms and spaces in existing facilities turned over for the Work, including Owner property remaining within as required to prevent soiling or damage from dust, dirt, water, and/or fumes. Contractor shall protect areas adjacent to the Work in a similar manner. Prior to Owner occupancy, Contractor shall clean all surfaces including Owner property.

L. Contractor shall protect all surfaces, coverings, materials, and finished Work from damage. Mobile equipment shall be provided with pneumatic tires.

M. The District reserves the right to place and install equipment in areas of the Project prior to Substantial Completion provided that it doesn't interfere with the completion of the Work. This partial occupancy shall not constitute acceptance of the Work by the District Representative.

N. Contractor shall not permit the use of portable and/or fixed radio's or other types of sound producing devices including Walkman's, iPod's, and similar devices.

1.04 EXISTING CONDITIONS

A. Contractor shall document the existing site and produce still photographs or video recording on DVD, sufficiently detailed, of existing conditions of adjoining construction, roads, and site improvements that might be misconstrued as damage caused by construction operations.

B. Contractor shall protect items indicated to remain against damage and soiling during construction.

C. Contractor shall protect existing IT equipment by properly covering and ventilating the equipment.

D. Coordinate procedures with District Representative and District IT Department.

SECTION 01 12 16 PHASING OF THE WORK

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Requirements for phasing of the Work include logistics, phasing, and completion of designated phases prior to commencement of subsequent phases.

1.02 RELATED SECTIONS

A. Section 01 11 00: Summary of Work.

B. Section 01 31 13: Project Coordination.

C. Section 01 32 13: Construction Schedule.

D. Section 01 33 00: Submittal Procedures.

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

F. Section 01 77 00: Closeout Procedures.

1.03 SUBMITTALS

A. Contractor shall submit a Project site logistics plan in accordance with and as required by this Section.

PART 2 – PRODUCTS (Not applicable)

PART 3 – EXECUTION

3.01 LOGISTICS

A. Prior to commencement of the Work, Contractor shall prepare and submit to the District Representative, a detailed Project site logistic plan, in the same size and scale of the Drawings, setting forth Contractor plan of the Work relative to the following, but not limited to, items:

1. In accordance with local ordinances a truck access route to and from the Project site.
2. The identification of any overhead wire restrictions for power, street lighting, signal, and/or cable.
3. Construction parking.
4. Material staging and/or delivery areas.
5. Material storage areas.
6. Temporary trailer locations.
7. Location of temporary and/or accessible fire protection
8. Trash removal and location of dumpsters.
9. Location of portable sanitary facilities.
10. Stockpile and/or lay down areas.
11. Emergency Vehicle Access Routes.

B. A revised Project site logistic plan may be required by the District Representative for separately identified phases of the Work as set forth in this Section.

C. Contractor is responsible for securing and obtaining all approvals and permits from authorities having jurisdiction relative to logistic plan activities.

END OF SECTION 01 12 16

SECTION 01 21 00 ALLOWANCES

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. This Section specifies administrative and procedural requirements governing Contract allowances.

1. Allowances as set forth in the Specifications are to be used as compensation for items as set forth in this Section. The amounts listed in the schedule or Specifications are to be included in the base bid and shall be listed separately in the Schedule of Values and Application for Payment.

1.02 RELATED SECTIONS

A. Section 01 29 73: Schedule of Values Procedures.

B. Section 01 29 76: Progress Payment Procedures.

C. Section 01 32 13: Construction Schedule.

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

1.03 ALLOWANCES

A. Use the allowances only as authorized for Owner purposes and only by submitting a form that indicates the amounts to be charged to the respective allowance amount to the District Representative.

B. District Representative and Architect will review Contractor's basis for its use of any Allowance costs included in Contract Sum as required, and prior to the execution of Work described in Allowances.

C. At Substantial Completion of the Work or at any time designated by the District Representative, credit unused amounts remaining in the allowances to the Owner via Change Order.

1.04 ALLOWANCE DISBURSEMENT

A. Contractor shall submit a request for allowance disbursement to the District Representative. Include all substantiating and/or required data along with the request.

B. The request shall have the requested amount listed as an allowance disbursement without bond fees.

PART 2 – PRODUCTS (Not Applicable)

PART 3 – EXECUTION

3.01 SCHEDULE OF ALLOWANCES

A. Include in the base bid the following allowances in the following amounts:

Description Amount

The allowance shall be used solely by the District to address unknown and unforeseen items related to the VAV Valves Replacements required for the completion of the base bid scope of work, including electrical, piping, insulation, mechanical, and access issues. The allowances will be added to the final contract amount for award once the District determines the lowest, responsive bidder.

END OF SECTION 01 21 00

SECTION 01 23 00 ALTERNATES

1.01 SECTION INCLUDES:

A. This Section specifies administrative and procedural requirements governing alternate bid items.

1.02 RELATED SECTIONS:

A. Construction Services Agreement.

B. Section 01 11 00: Summary of Work.

PART 2 – PRODUCTS (Not applicable)

PART 3 – EXECUTION

3.01 SPECIFIC

A. Bid item is an amount proposed by bidder and stated on the Bid and Acceptance Form for certain Work defined in the Bidding Documents that may be added to or deducted from the base bid amount if Owner decides to accept a corresponding change in either the amount of Work to be completed, the Contract Documents, or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.

1. The amount added or deducted from the base bid is the net addition to or deducted from the base bid to incorporate bid item Work into the Work. Unless noted otherwise, no other adjustments are made to the Contract Amount, Milestones, or the Contract Time.

3.02 PROCEDURES

A. Contractor shall modify or adjust affected adjacent Work as necessary to completely and fully integrate Owner accepted bid item Work.

1. Include as part of each bid item, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not mentioned as part of the bid item.

B. Accepted bid items are subject to the same terms and conditions as other Work of the Contract Documents.

C. Owner reserves the right to accept alternates for bid items on and up to issuance of the Notice to Proceed.

D. Schedule: A schedule of bid items is included at the end of this Section. The Contract Documents referenced in the schedule identify necessary requirements to complete the Work described as specified for each bid item.

3.03 SCHEDULE OF BID ALTERNATE ITEMS: (NOT USED)

END OF SECTION 01 23 00

SECTION 01 26 13 REQUEST FOR INFORMATION PROCEDURES

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Procedure for requesting information of the intent of the Contract Documents.

1.02 RELATED SECTIONS

A. Construction Services Agreement.

B. Section 01 11 00: Summary of Work.

C. Section 01 31 13: Project Coordination.

D. Section 01 32 13: Construction Schedule.

D. Section 01 77 00: Contract Closeout.

PART 2 – PRODUCTS (Not used)

PART 3 – EXECUTION

3.01 PROCEDURE

A. Contractor shall prepare a Request for Information. Refer to Appendix A for a sample RFI form. Contractor shall transmit the Request for Information to Architect with sketches, pictures and a suggested solution (if applicable) with a concurrent copy to the District Representative.

B. Architect response is a clarification of the intent of the Contract Documents and does not authorize changes in the Contract Amount, Milestones, and/or Contract Time.

C. A Request for Information may be returned with a stamp or notation "Not Reviewed," if:

1. The requested information is ambiguous or unclear.

2. The requested information is equally available to the requesting party by researching and/or examining the Contract Documents.

3. Contractor has not reviewed the Request for Information prior to submittal.

D. Review Time: After receipt by Architect and District Representative, allow **fourteen (14)** calendar days for response time by Architect. Contractor shall verify and is responsible for verifying Architect and District Representative receipt of a Request for Information.

E. Subcontractor-Initiated and Supplier-Initiated RFIs: RFIs from subcontractors and material suppliers shall be submitted through, be reviewed by and be attached to an RFI prepared, Signed and submitted by Contractor. RFIs submitted directly by subcontractors or material suppliers will be returned unanswered to the Contractor.

1. Contractor shall review all subcontractor and supplier initiated RFIs and take actions to resolve issues of coordination, sequencing, and layout of the Work.

2. RFIs submitted to request clarification of issues related to means, methods, techniques and sequences of construction or for establishing trade jurisdictions and scopes of subcontracts will be returned without interpretation. Such issues are solely the Contractor’s responsibility.

3. Contractor shall be responsible for delays resulting from the necessity to resubmit an RFI due to insufficient or incorrect information presented in the RFI.

F. RFI Log: Contractor shall prepare and maintain a log of RFIs, and at any time requested by the Architect, Project Inspector, or District Representative, the Contractor shall furnish copies of the log showing all outstanding RFIs.

END OF SECTION 01 26 13

SECTION 01 29 73 SCHEDULE OF VALUES PROCEDURES

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Procedure for submission of a Schedule of Values for review and approval by the District Representative.

1.02 RELATED SECTIONS

E. General Conditions.

F. Section 01 21 00: Allowances.

G. Section 01 23 00: Alternates.

H. Section 01 29 76: Progress Payment Procedures.

I. Section 01 31 13: Project Coordination.

J. Section 01 32 13: Construction Schedule.

K. Section 01 32 29: Project Forms.

L. Section 01 33 00: Submittal Procedures.

PART 2 – PRODUCTS (Not used)

PART 3 – EXECUTION

3.01 PREPARATION

A. In accordance with the General Conditions, Contractor shall commence preparation of a Schedule of Values on the form included in Section 01 32 29.

B. Contractor shall coordinate the preparation of a Schedule of Values with preparation of the Construction Schedule as set forth in Section 01 32 13.

C. Round amounts to the nearest whole dollar; the total shall equal the Contract Amount.

D. Provide a breakdown of the Contract Amount in enough detail acceptable to District Representative to facilitate continued evaluation of Application for Payment and progress reports. Coordinate with the Project Manual table of contents and Schedule of Values form under Section 01 32 29. Provide breakdown of all subcontract amounts.

E. Provide separate line items for items in the Schedule of Values for total installed value of that part of the Work.

F. Provide separate line item for labor and material when applicable.

G. Each item in the Schedule of Values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item except the amounts shown as separate line items as indicated under Schedule of Values form.

H. Temporary facilities and other cost items that are not direct cost of actual work-in-place shall be shown as separate line items as indicated under Schedule of Values form.

I. If at any time, District Representative determines, in its reasonable discretion, that the schedule of Values does not approximate the actual cost being incurred by Contractor to perform the Work, Contractor shall prepare, for District Representative approval, a revised Schedule of Values, which then shall be used as the basis for future progress payments. Without changing the Contract Amount, District Representative reserves the right to require Contractor:

1. To increase or decrease amounts within the line items in the Schedule of Values; and,

2. To conform the price breakdown to Owner accounting practice.

END OF SECTION 01 29 73

SECTION 01 29 76 PROGRESS PAYMENT PROCEDURES

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. This Section specifies administrative and procedural requirements relative to an Application for Payment.

1. Coordinate the Schedule of Values and Application for Payment with, but not limited to, the Construction Schedule, submittal log, and list of Subcontractors.

1.02 RELATED SECTIONS

A. General Conditions.

B. Section 01 21 00: Allowances.

C. Section 01 23 00: Alternates.

D. Section 01 29 73: Schedule of Values Procedures.

E. Section 01 32 13: Construction Schedule.

F. Section 01 32 29: Project Forms.

G. Section 01 74 19: Construction and Demolition Waste Management.

H. Section 01 77 00: Contract Closeout.

PART 2 – PRODUCTS (Not applicable)

PART 3 – EXECUTION

3.01 APPLICATION FOR PAYMENT

A. Each Application for Payment shall be consistent with previous applications and payments as reviewed by Project Inspector, Architect, and District Representative. The following Applications for Payment involve additional requirements:

1. The Initial Application for Payment

2. The Final Application for Payment

B. Payment Application Times: The period of Work covered by each Application for Payment is the payment date for each progress payment as specified in the General Conditions. The period covered by each Application for Payment is the previous month.

C. Contractor shall submit a draft Application for Payment seven (7) days prior to the first of each month, to be reviewed by the Architect, District Representative, and Project Inspector.

D. Payment Application Checklist: Use required form for the Application for Payment per Section 01 32 29.

E. Application Preparation: Complete every entry on the form. Include execution by a person authorized to sign legal documents on behalf of Contractor.

F. Transmittal: Submit a minimum of five (5) wet signature originals of each Application for Payment to the District Representative. All copies shall be complete, including releases and similar attachments.

1. Transmit each copy with a transmittal form listing attachments and recording appropriate information related to the application, in a manner acceptable to District Representative.

2. Provide the Contractor Payment Checklist form, included as part of District Forms.

G. *Initial Application for Payment*: Administrative actions and submittals, that must precede or coincide with submittal for the first Application for Payment include, but are not limited to, the following:

1. Schedule of Values.

2. Construction Schedule.

3. Submittal Schedule.

4. Emergency Contact List.

5. Local Hire Policy Forms.

6. Releases.

7. Resume of Contractor's Project Manager, Job Site Superintendent, and Land Surveyor.

H. *Applications for Payment*: Administrative actions and submittals that must precede or coincide with submittal of Progress Applications for Payment include, but are not limited to, the following:

1. Certified Payroll (submitted directly to Labor Compliance Consultant in electronic format as specified by District Representative).

2. Updated and current Project Record Drawings (as-built). Visual verification necessary only.

3. Monthly Construction Schedule (updated, submitted and approved).

4. Approved Schedule of Values.

5. List of Subcontractors (Payments Summary).

6. Waivers and Releases.

7. Updated Submittal Schedule.

8. Material invoices, evidence of equipment purchases, rentals, and other backup materials to support cost as requested by the District Representative.

I. *Final Payment Application*: Administrative actions and submittals that must precede or coincide with submittal of the final Application for Payment include, but are not limited to, the following:

1. Project Inspector's sign-off and final approval of Project's DSA Form(s) 152.

2. Contractor's submission of Contractor's Verified Report DSA Form 6-C.

3. Completion of Contract Closeout requirements.

4. Updated and Final As-Built drawings – in accordance with General Conditions.

5. Completion and acceptance of final punch list items.

6. Delivery of extra materials, products, and/or stock.

7. Identification of unsettled claims.

8. Proof that taxes, fees, and similar obligations are paid.

9. Operating and maintenance instruction manuals.

10. Consent of surety to final payment.

11. Waivers and releases.

12. Warranties, guarantees and maintenance agreements.

13. Training.

14. Removal of temporary facilities and services.

15. Removal of surplus materials, rubbish, and similar elements.

16. Deductive items pursuant to the General Conditions.

17. Completion and submission of all final change orders for the project.

18. Disabled Veteran Business Enterprise (DVBE) Contractor close-out statement.

J. Any payments made to Contractor where criteria set forth above have not been met shall not constitute a waiver of said criteria by District Representative. Instead, such payment shall be construed as a good faith effort by District Representative to resolve differences so Contractor may pay its Subcontractors and suppliers and that Contractor agrees that failure to submit such items may constitute a breach of contract by Contractor and may subject Contractor to termination.

END OF SECTION 01 29 76

SECTION 01 31 13 PROJECT COORDINATION

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. This Section specifies administrative and procedural requirements necessary for coordinating Work operations including, but not limited to, the following:

1. General coordination procedures.

2. Coordination drawings.

1.02 RELATED SECTIONS

A. Section 01 12 16: Phasing of the Work.

B. Section 01 31 19: Project Meetings.

C. Section 01 32 13: Construction Schedule.

D. Section 01 33 00: Submittal Procedures.

E. Section 01 45 23: Testing and Inspection.

F. Section 01 73 29: Cutting and Patching.

PART 2 – PRODUCTS (Not used)

PART 3 – EXECUTION

3.01 COORDINATION

A. It is the Contractor's responsibility to coordinate the Work to minimize conflicts and optimize efficiency.

B. District Office occupancy will remain in session all year.

C. The placement of pipes, conduits, other materials, and the locations, size and reinforcement of holes in the building structure shall conform to the structural Drawings and Specifications. When the requirements of the Mechanical, Electrical or other sections of the Specifications or Drawings are in conflict with the structural requirements, the structural requirements shall take precedence. The Contractor shall take all precautions prior to coring into a building structure. The Contractor must notify the structural engineer and obtain written approval prior to completing any structural penetrations if the structural integrity of an existing building structure is compromised. Refer to section 01 73 29, Cutting and Patching.

D. Verify that utility, and other building system requirement characteristics of operating equipment are compatible with existing utilities, and other existing building systems. Coordinate work of various Sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.

E. Contractor shall coordinate operations included in various sections of Contract Documents to assure efficient and orderly installation of each part of Work. Coordinate Work operations included under related sections of Contract Documents that depend on each other for proper installation, connection, and operation of Work, including but not limited to:

1. Schedule construction operations in sequence required where installation of one part of Work depends on installation of other components, before or after its own installation.

2. Coordinate installation of different components to assure maximum accessibility for required maintenance, service, and repair.

3. Provide provisions to accommodate items scheduled for later installation.

4. Prepare and administer provisions for coordination drawings.

F. Where necessary, prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required in notices, reports, attendance at meetings, and:

1. Prepare similar memoranda for District Representative and Separate Work Contract where coordination of their Work is required.

G. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and assure orderly progress of Work. Such administrative activities include, but are not limited to, the following:

1. Preparation of schedules.

2. Installation, relocation, and removal of temporary facilities.

3. Delivery and processing of submittals.

4. Progress meetings.

5. Project closeout activities.

H. Conservation: Coordinate Work operations to assure operations are carried out with consideration given to conservation of energy, water, materials, and:

1. Salvage materials and equipment involved in performance of, but not actually incorporated into Work.

I. Contractor shall provide advance notice (minimum of three (3) working days) to District Representative of any required electrical or HVAC shut down activities for the District to properly prepare for these activities and the down time that will occur.

J. Contractor shall provide advance notice (minimum of three (3) working days) to District Representative of any required testing of active cabling for the District to properly prepare for these activities and the down time that will occur.

3.02 SUBMITTALS

A. Coordination Drawings: Contractor shall prepare coordination drawings to coordinate the installation of products and materials fabricated, furnished and installed by separate entities, under different parts of the Contract. Contractor shall notify District Representative and Architect of all major conflicts in writing in a timely manner so that the design team can respond without construction delays. Coordination drawings shall address the following at a minimum:

1. Limitations in available space for installation or service. Contractor shall overlay plans of each trade and verify space requirements and conflicts between trades. Minor changes and adjustments that do not affect design intent shall be made by Contractor and shall be highlighted for Architect's review.

2. Incompatibility between items provided under different trades (such as difference in voltage between equipment specified under Divisions 22 and 23 and electrical power provided under Division 26.)

3. Inconsistencies between drawings, specifications and codes (between trades and within each trade).

4. Additional items required for existing facilities construction projects shall be designed and prepared from available as-built drawings that are verified through non-invasive and non-destructive, visual observation only. Contractor shall field verify actual existing conditions during and upon completion of demolition work and incorporate findings into preparation of coordination drawings. Minor changes and adjustments that do not affect design intent shall be made by Contractor and shall be highlighted for District Representative and Architect's reviews.

B. Contractor and each Subcontractor shall provide and forward reproducible copies and AutoCAD or Revit drawing files in the order described here:

1. Structural shop drawings shall indicate location and sizes of columns, beams and other structural members, as well as wall, roof and slab penetrations, and will be provided to mechanical,

electrical, low voltage and plumbing Sub-Contractors for coordination. Structural items shall be indicated using black lines.

2. HVAC Subcontractor will indicate all ductwork, piping and equipment complete with installation and dimensioned service clearances, duct and pipe sizes, fitting types and sizes, top or bottom of duct and pipe elevations, distances of ducts, pipes and equipment from building reference points and hanger and support locations. Minor changes and adjustments that do not affect design intent shall be made by Subcontractor and shall be highlighted for District Representative and Architect's reviews. Forward drawings to plumbing Subcontractor for further coordination. HVAC items shall be indicated using orange lines.

3. Plumbing Subcontractor will indicate all plumbing lines, and equipment complete with installation and dimensioned service clearances, pipe sizes, fitting types and sizes, top or bottom of pipe elevations, distances of pipes and equipment from building reference points and hanger/support locations Coordinate with HVAC Subcontractor. Minor changes and adjustments that do not affect design intent shall be made by Subcontractor and shall be highlighted for District Representative and Architect's reviews. Upon completion, drawings shall be forwarded to Fire Sprinkler Subcontractor for further coordination. All Plumbing items shall be indicated using blue lines.

4. Fire sprinkler Subcontractor will indicate fire sprinkler piping and equipment complete with installation and dimensioned service clearances, pipe sizes, fitting types and sizes, top or bottom of pipe elevations, distances of pipes and equipment from building reference points and hanger or support locations. Coordinate with Plumbing and HVAC Subcontractors. Minor changes and adjustments that do not affect design intent shall be made by sub-Contractors and shall be highlighted for District Representative and Architect's reviews. Upon completion drawings shall be forwarded to Electrical Contractor for further coordination. Fire sprinkler equipment shall be indicated using red lines.

5. Electrical and Low Voltage Subcontractors will indicate service and feeder conduit runs and other electrical equipment complete, including low voltage with installation and dimensioned service clearances, sizes, top or bottom of conduit and rack elevations, distances of conduits and equipment from building reference points and hanger and support locations. Coordinate with Fire Sprinkler, Plumbing and HVAC Subcontractors. Minor changes and adjustments that do not affect design intent shall be made by sub-Contractors and shall be highlighted for District Representative and Architect's reviews. Upon completion drawings shall be forwarded to Contractor for further coordination. Electrical work shall be indicated in dark green lines. Low voltage work shall be indicated in light green lines.

6. Contractor will be responsible for the overall coordination review. As each coordination drawing is completed, Contractor will meet with Architect and/or District Representative to review and resolve conflicts on coordination drawings.

7. Coordination meetings will be held in Project field office of Contractor. Contractor is required to distribute Shop Drawings, cut sheets and submittals to Subcontractors where appropriate. Reviewed coordination drawings will be maintained in Project field office of Contractor. Meeting minutes shall be developed by Contractor and submitted to District Representative within five (5) days.

8. All Contractors shall review and sign the final coordinated set of drawing(s) prior to construction of system(s) depicted in the drawing(s).

END OF SECTION 01 31 13

SECTION 01 31 19 PROJECT MEETINGS

PART 1 – GENERAL

1.01 SECTION INCLUDES

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

1. Preconstruction meeting.
2. Pre-installation conferences.
3. Progress meetings.
4. Meetings as required by District Representative.

1.02 RELATED SECTIONS

A. Section 01 12 16: Phasing of the Work.

B. Section 01 31 13: Project Coordination.

C. Section 01 32 13: Construction Schedule.

D. Section 01 33 00: Submittal Procedures.

PART 2 – PRODUCTS (Not used)

PART 3 – EXECUTION

3.01 PRECONSTRUCTION MEETING

A. District Representative will schedule a preconstruction meeting before starting the Work, at a time and date determined by District Representative. Meeting shall be held at the Project site or another location as determined by District Representative. Meeting will be held in order to review responsibilities, procedures, and other administrative requirements contained within the Contract Documents. Major trades may attend.

B. Authorized representatives of District, Project Inspector, Architect, Contractor and other parties shall attend the meeting. All participants at the meeting shall be familiar with the Project and authorized to conclude matters relating to the Work.

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

1. Identification of District Representative, key team members, and roles/responsibilities
2. Preliminary Construction Schedule.
3. Critical work sequencing and coordination of other work on campus.
4. Designation of responsible personnel and emergency contacts.
5. Procedures for processing field decisions.
6. Request for Proposal.
7. Request for Information.
8. Construction Change Directive, Immediate Change Directive, and Change Order.
9. Procedures for processing Applications for Payment.
10. Labor Compliance and Wage Determinations.
11. Submittal and review of Shop Drawings, Product Data, material lists, and Samples.
12. Preparation of project record documents.

13. Use of the Project site and/or premises, staging plan, trucking routes, haul routes, etc.

14. Parking availability.

15. Office, work, and storage areas.

16. Equipment deliveries and priorities.

17. Safety procedures.

18. Emergency response.

19. First Aid.

20. Security.

21. Housekeeping.

22. Working hours.

23. Insurance Services

24. Environmental Health and Safety / Import and Export Testing Requirements.

25. Substantial Occupancy, Administrative Closeout and Contract Completion requirements and procedures.

26. Local Hire.

D. District Representative shall prepare and issue meeting minutes to attendees and interested parties no later than three (3) calendar days after the meeting date.

3.02 PRE-INSTALLATION CONFERENCES

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

B. Contractor, manufacturers, and fabricators involved in or affected by the installation and its coordination or integration with other preceding and/or subsequent installations of Work shall attend the meeting. Contractor shall advise District Representative, Project Inspector, and Architect of scheduled meeting dates and provide an agenda 48 hours prior to meeting.

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

a. Contract Documents.

b. Options.

c. Related Construction Change Directives and Change Orders.

d. Purchases.

e. Deliveries.

f. Shop Drawings, Product Data, and quality-control samples.

g. Review of mockups.

h. Possible conflicts.

i. Compatibility problems.

j. Time schedules and work sequence.

k. Weather limitations.

l. Manufacturer’s recommendations.

m. Warranty requirements.

n. Compatibility of materials.

o. Acceptability of substrates.

p. Temporary facilities.

q. Space and access limitations.

r. Governing regulations.

s. Safety.

t. Inspecting and testing requirements.

u. Required performance results.

v. Recording requirements.

w. Protection.

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

3.03 PROGRESS MEETINGS

A. Progress meetings will be held at the Project site at regular intervals, typically bi-weekly or weekly, as determined by the District Representative.

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

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

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

1. Safety

2. Field Engineer notes.

3. Interface requirements.

4. Construction Schedule.

5. Sequence and coordination.

6. Status of submittals / RFIs.

7. Deliveries.

8. Off-site fabrication.

9. Access.

10. Site utilization.

11. Temporary Construction Facilities and Controls.

12. Hours of work.

13. Hazards and risks.

14. Housekeeping.
15. Quality of materials, fabrication, and execution.
16. Unforeseen conditions.
17. Testing and Inspection.
18. Defective Work.
19. Construction Change Directive.
20. Request for Proposal.
21. Change Order Proposals and Change Orders.
22. Documentation of information for payment requests.
23. Application for Payment.
24. Other items as required or as brought forth.
25. Initial Notice of Start of Issue.
26. Final Notice of End of Issue.
27. Storm Water Pollution Prevention Plan.

3.04 ADDITIONAL MEETINGS

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

END OF SECTION 01 31 19

SECTION 01 32 13 CONSTRUCTION SCHEDULE

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Construction Schedule procedures, preparation, submittal, updates, and revisions.

1.02 RELATED REQUIREMENTS

A. General Conditions.

B. Section 01 11 00: Summary of Work.

C. Section 01 12 16: Phasing of the Work.

D. Section 01 23 00: Alternates.

E. Section 01 29 73: Schedule of Values Procedures.

F. Section 01 29 76: Progress Payment Procedures.

G. Section 01 31 13: Project Coordination.

H. Section 01 33 00: Submittal Procedures.

I. Section 01 45 23: Testing and Inspection.

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

K. Section 01 78 36: Warranty Procedures.

1.03 PROCEDURES

A. Within ten (10) calendar days after date of Notice to Proceed, Contractor shall submit to District Representative for review, a detailed Construction Schedule ("Preliminary Baseline Schedule") setting forth all requirements for complete execution of the Work.

B. Within seven (7) calendar days after receipt of the District Representative's review comments, submit a final Construction Schedule acceptable to District Representative ("Approved Baseline Schedule").

C. Include a written summary narrative sufficiently comprehensive to explain basis of Contractor's approach to work.

D. If a Construction Schedule is considered by District Representative to not be in compliance with any requirement of the Contract, Contractor will be notified to review and revise the Construction Schedule and bring it into compliance. Failure of Contractor to submit a Construction Schedule in full compliance with the Contract Documents will result in withholding of progress payment in accordance with the General Conditions or Construction Services Agreement. The Construction Schedule is to be used in evaluating progress for payment approval.

E. Subsequently with each Progress Payment Request, Contractor shall deliver to District Representative an updated Construction Schedule reflecting Work progress to the end of the Progress Payment Request period. Each such Construction Schedule shall indicate actual progress to date in execution of the Work, together with a projected schedule for completion of all the Work.

1.04 SCHEDULE SUBMITTAL PREPARATION GUIDELINES

A. The Contract Work shall be scheduled and progress monitored using a Critical Path Method (CPM) network type scheduling system. Schedule shall be broken into sub-activities which shall, as a minimum, include major suppliers, all submittal approvals, all major trades, plumbing, mechanical, electrical, security,

fire, and elevators and escalators. Scheduling system shall indicate all inter-relationships between trades and suppliers.

B. Contractor shall utilize the Critical Path Method (CPM) in the development and maintenance of the construction schedule network.

C. Duration and events indicated on schedule shall conform to phasing set forth in Section 01 12 16: Phasing of the Work and shall show any area or building within a particular phase. Schedule shall indicate any and all Contract "milestone events" and other milestones agreed to by District Representative, but no other manually-imposed dates will be accepted unless approved by District Representative.

D. Construction Schedule shall represent a practical plan to complete the Work within the Contract time requirement.

1. A schedule extending beyond Contract time or less than Contract time will not be acceptable.

2. A schedule found unacceptable by District Representative shall be revised by Contractor and resubmitted.

E. Construction schedule shall clearly indicate sequence of construction activities, grouped by applicable phase and sorted by areas, buildings, or facilities within phase, and shall specifically indicate:

1. Start and completion of all Work items, their major components, and interim milestone completion dates, as determined by Contractor and District Representative.

2. Activities for procurement, delivery, installation of equipment, materials, and other supplies, including:

a. Time for submittals, resubmittals, and reviews. Include decision dates for selection of finishes.

b. Time for manufactured products for the Work fabrication and delivery.

c. Interdependence of procurement and construction activities.

d. As applicable, dates for testing, balancing equipment, and final inspection.

F. Schedule shall be in sufficient detail to assure adequate planning and execution of the Work.

1. Each task activity shall range in duration from a 1 workday minimum to a fifteen (15) workday maximum and shall be total of actual days required for completion. The activity duration shall include consideration of weather impact on completion of that activity.

2. Schedule shall be suitable, in judgment of District Representative, to allow monitoring and evaluation of progress in performance of the Work; it shall be calendar time-scaled.

3. Activities shall include:

a. Description; what is to be accomplished and where.

b. Workday duration.

c. Scheduled activities shall indicate continuous flow, from left to right.

4. Contractor shall setup up the schedule calendar to identify workdays per week and shifts per day worked, non-work days, weekends and holidays.

G. Failure to include any element of Work required for performance of this Contract shall not excuse Contractor from completing Work required to comply with the Contract Documents, notwithstanding acceptance of Construction Schedule.

H. Submittal of Construction Schedule shall be understood to be Contractor’s confirmation that the schedule meets requirements of the Contract Documents, and that the Work will be executed in sequence indicated in schedule.

I. All Construction Schedule submittals shall be transmitted with a Letter of Transmittal and shall include six (6) copies and one reproducible copy of a sufficient agreed upon size and the electronic file of the schedule in the format as required by District Representative.

1.05 REVIEWS, UPDATES, AND REVISIONS

A. District Representative will review and return the initial submittal of Contractor's Construction Schedule, with summary comments. If revisions are required, Contractor shall resubmit Schedule within seven (7) calendar days following receipt of District Representative's comments.

B. After Contractor and District Representative agree to a base line schedule, it will become the Project Construction Schedule. No changes to the Baseline Schedule will be allowed unless accepted by District Representative.

C. Contractor shall analyze and update the Project Construction Schedule:

1. As part of monthly payment application, Contractor shall submit to and participate with District Representative in a schedule review to include:

a. Actual start dates for Work items started during report period.

b. The percent complete on activities that have actual start dates.

c. Actual completion dates for Work items completed during report period.

d. Estimated remaining duration for Work items in progress, which will not exceed original duration for activity.

e. Estimated start dates for Work items scheduled to start during month following report period, if applicable.

f. Changes in duration of Work items.

2. In case of a change to Contractor's planned sequence of Work, Contractor shall include a narrative report with updated progress schedule which shall include, but not be limited to, a description of problem areas, current and anticipated delaying factors, and any proposed revisions for a recovery plan.

3. Change Orders affecting the scheduled completion date shall be clearly identified as separate and new activities integrated into the schedule at the appropriate time and in the appropriate sequence as reviewed and approved by District Representative.

4. The Project Construction Schedule Review will not relieve Contractor of responsibility for accomplishing all Work in accordance with the Contract Documents.

D. Updates: Contractor shall submit to District Representative, with each payment application, an up-to-date Project Construction Schedule. Contractor submission of the Monthly Updated Project Construction Schedule is a condition precedent to District Representative's approval of Progress Payments. The Update Project Construction Schedule shall include the following:

1. Work Item Report: Detailing Work items and dependencies as indicated on the Schedule.

2. Actual Start and End Dates of Activities under construction

3. Separate listing of activities completed during reporting period.

4. Separate listing of activities which are currently in progress, indicating their remaining duration and percentages completed.

5. Separate listing of activities which are causing delay in Work progress.

6. Narrative report to define problem areas, anticipated delays, and impact on the Project Construction Schedule. Contractor shall report corrective action taken, or proposed, and its effect, including effect of changes on schedules of separate contractors.

7. Resolution of conflict between actual Work progress and schedule logic: when out-of-sequence activities develop in the Schedule because of actual construction progress, Contractor shall submit a revised schedule to conform to current job sequence and direction.

E. If, according to current updated Project Construction Schedule, District Representative determines Contractor is behind schedule or any interim milestone completion dates will not be met, considering all time extensions to which Contractor is entitled, Contractor shall submit a revised recovery schedule,

showing a workable plan and a narrative description to complete the project on time. Refer to General Conditions.

F. Scheduling of change or extra Work orders is responsibility of Contractor.

1. Contractor shall revise the Project Construction Schedule to incorporate all activities involved in completing change orders or extra Work orders and submit it to District Representative for review.

G. If District Representative finds Contractor is entitled to extension of any completion date, under provisions of the Contract, District Representative's determination of total number of days of extension will be based upon an analysis of the current Project Construction Schedule, and upon data relevant to the extension.

H. Contractor acknowledges and agrees that delays to non-critical activities will not be considered a basis for a time extension unless activities become critical. Non-critical activities are those activities which, when delayed, do not affect an interim or Substantial Completion date.

I. Contractor shall allow Float time for inclement weather, Government Delay, and Project Float in the Baseline Schedule in accordance with the General Conditions. The Inclement Weather Float and the Government Delay Float shall each be identified as a Critical Activity in the Baseline Schedule. No other activities may be concurrent with them. When rainfall at the Project site impacts Critical Path activities, Contractor may provide District Representative with a written request for a rain impact day describing the inclement weather delay on the Critical path activities. The inclement weather delay must be clearly indicated by a seventy-five percent (75%) decrease in the normal field labor workforce hours on Critical Path activities on the day in question as indicated by Contractor's Daily reports from the day in question and the scheduled Work days prior to the day in question. Upon District Representative's independent confirmation of the amount of rainfall and impact, District Representative will authorize Contractor to reduce the duration of the Rain Day Impact Allowance by one day. Rainfall on non-scheduled workdays shall not be granted as rain impact days. If the effects of rain from a non-scheduled Work day carry forward to a scheduled work day and impacts the Critical Path as noted above, then the scheduled work day will be considered impacted by rain.

1.06 CONTRACTOR'S RESPONSIBILITY

A. Nothing in these requirements shall be deemed to be an usurpation of Contractor's authority and responsibility to plan and schedule Work as Contractor sees fit, subject to all other requirements of Contract Documents.

B. Contractor shall provide at all times sufficient competent labor, materials, and equipment to properly carry on Work and to insure completion of each part in accordance with Construction Schedule and within time allowed in the Contract.

C. Contractor shall be responsible for ensuring that all submittals to the District Representative are accurate and consistent. Damage, including extra time and cost, caused by inaccuracies from Contractor will be compensated by Contractor.

1.07 SUSPENSION OF PAYMENTS

A. Initial Submittal: If Contractor fails to comply with the specified requirements, District Representative reserves the right to engage an independent scheduling consultant to fulfill these requirements. Upon additional notice to Contractor, District Representative shall retain against Contractor all incurred costs for additional services.

B. Update Submittals: District Representative has the right to withhold progress payments if Contractor fails to update and submit the Project Construction Schedule and reports as required by District Representative.

1.08 RECORD COPY

A. Prior to the Contract Completion, Contractor shall submit the Project Construction Schedule showing the as-built sequence. The as-built schedule shall have all activities with actual start and end dates.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

END OF SECTION 01 32 13

SECTION 01 32 29 PROJECT FORMS

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. The following, but not limited to, District administrative forms and documents listed in this Section to be utilized in the administration of the Work.

B. Electronic versions of these forms are available if requested from the District Representative.

C. From time to time, Owner may release new revisions and new Project Forms. At any time during the Project, if requested by District Representative, Contractor shall use the newly released Project Form(s).

1.02 RELATED DOCUMENTS

B. Procurement and Contract Provisions (PARTS 1 and 2).

C. Division 01.

PART 2 – PRODUCTS (Not applicable)

PART 3 – EXECUTION

3.01 FORMS: Contractor to utilize the following District standard forms (refer to Appendix A for a copy of the forms listed below)

A. Application for Payment / Schedule of Values

B. Change Order

C. Conditional Waiver and Release – Final Payment

D. Conditional Waiver and Release – Progress Payment

E. Immediate Change Directive

F. Unconditional Waiver and Release – Final Payment

G. Unconditional Waiver and Release – Progress Payment

H. Construction Waste Management Plan

I. Construction Waste Management Progress Report

J. Request for Import Material Testing

K. Certificate of Substantial Completion

L. Warranty Guarantee Form

M. Substitution Request Form (Post Award)

3.02 PROCEDURES

A. Application for Payment/Schedule of Values: This form is used in requesting a progress payment and to establish the basis of the certified application for payment.

B. Change Order: This form is used to adjust the Contract Amount, Milestones and/or the Contract Time.

C. Conditional Waiver and Release: Use this form when the claimant is required to execute a waiver and release in exchange for or in order to induce the payment of a progress payment and the claimant has not been paid.

D. [RESERVED]

E. Immediate Change Directive: This form is used to issue an Immediate Change Directive.

F. Unconditional Waiver and Release: Use this form when the claimant is required to execute a waiver and release in exchange for or in order to induce payment of a progress payment and the claimant asserts in the waiver that he or she has in fact been paid the progress payment.

G. [RESERVED]

H. Construction Waste Management Plan: This form is used to provide a Waste Management Plan, submitted in accordance with Specification Section 01 74 19 and prior to any waste removal.

I. Construction Waste Management Progress Report: This form is used to provide a Waste Management Monthly Progress Report, summarizing waste generated by Project and submitted monthly with Application for Payment.

J. Letter of Assent: This form is to be signed by all Contractors awarded work covered by the Community and Student Workforce Project Agreement (CSWPA).

K. CSWPA Craft Request Form: This form is to be used to request Craft Workers from the applicable union that will fulfill all hiring requirements for the project.

L. Core Employee List: This form is to be completed by All Prime Contractors/Consultants, Subcontractor/Sub-consultants intending to employ core workers. Complete this list and then forward to the District's Labor Compliance Consultant.

M. Monthly Employee Utilization Form: This form is to be completed monthly and then to be forwarded to the District's Labor Compliance Consultant.

N. Modified Certified Payroll Form: This form is to be completed monthly and then to be forwarded to the District's Labor Compliance Consultant in addition to the electronic Certified Payroll.

O. Checklist of Labor Law Requirements: This is to be completed by all Contractors, acknowledging and understanding the Federal and State Labor Law.

P. Request for Import Material Testing: This form is the be completed and provided to District Representative in accordance with Specification Section 01 45 24.

Q. Certificate of Substantial Completion: This form is to be completed and signed by all parties once project has been determined to be substantially complete.

R. Warranty Guarantee Form: This form shall be filled out and signed by Contractor and Subcontractors prior to completion of closeout activities.

S. Construction Contingency Work Authorization: This form shall be filled out and signed by Contractor then issued to District Representative for review and approval.

T. Substitution Request Form: This form shall be provided for any substitution requests after award as further described in Specification Sections 01 60 00, 01 62 11, and the Procurement and Contract Provisions (General Conditions).

END OF SECTION 01 32 29

SECTION 01 33 00 SUBMITTAL PROCEDURES

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Administrative and procedural requirements for submittals required for the Work, including but not limited to; Shop Drawings, Product Data, Samples, material lists, and quality control items as required by the Contract Documents.

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

C. To ensure that specified products are furnished and installed in accordance with the design intent, Facility Design Standards and procedures have been established for submittal of design data and for its review by District Representative, Architect, and/or others.

1.02 RELATED SECTIONS

A. General Conditions.
B. Section 01 12 16: Phasing of the Work.
C. Section 01 29 73: Schedule of Values Procedures.
D. Section 01 29 76: Progress Payment Procedures.
E. Section 01 31 13: Project Coordination.
F. Section 01 32 13: Construction Schedule.
G. Section 01 45 23: Testing and Inspection.
H. Section 01 50 00: Construction Facilities and Temporary Controls.
I. Division 2 through Division 32.

PART 2 – PRODUCTS (Not applicable)

PART 3 – EXECUTION

3.01 GENERAL REQUIREMENTS AND PROCEDURES

A. Contractor shall package each submittal appropriately for transmittal and handling and will then send Architect, and District Representative submittal for review per the Project plans and specifications. Submittals will not be accepted from sources other than from Contractor.

1. All data active infrastructure and structured cabling submittals must also be provided to RSCCD ITS Department for electronic review in PDF format.

B. Contractor shall clearly identify any deviations from the Contract Documents on each submittal. Any deviation not so noted, even if stamped reviewed, is not acceptable.

C. After Architect review, Architect shall transmit submittals to Contractor, District Representative, and Project Inspector. Contractor shall further distribute to Subcontractors and others as required. Work shall not commence, unless otherwise approved by District Representative, and/or Architect until approved submittals are transmitted to Contractor.

D. Contractor's Review and Approval: Every submittal upon which proper execution of the Work is dependent shall bear the Contractor's review and approval stamp, dated and signed by Contractor. Certifying that Contractor (a) has reviewed, checked, and approved the submittal and has coordinated the submittal contents with requirements of Work and Contract Documents including related Work, (b) Contractor coordinated with all other shop drawings received to date and this duty of coordination has not been delegated to subcontractors, material suppliers, the Architect, or the engineers on this project, (c) determined and verified quantities, field measurements, construction criteria, materials, equipment, catalog numbers and identifications, and similar data, or will do so, and (d) states the Work illustrated or described in the submittal is recommended by Contractor and the Contractor's warranty will fully apply thereto.

E. Contractor shall coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities requiring sequential activity.

F. Timing of Submittals:

2. Submittals shall not delay the construction schedule and shall be submitted in timely manner in accordance with General Conditions.

3. In accordance with General Conditions Contractor shall submit to the Architect, those Shop Drawings, Product Data, diagrams, materials lists, Samples and other submittals required by the Contract Documents.

4. The Contractor shall submit within ten (10) calendar days of the Notice to Proceed, an itemized listing of required submittals with a scheduled date for each submittal. The schedule of submittals shall provide adequate time between submittals in order to allow for proper review without negative impact to the Construction Schedule.

5. Schedule of submittals shall be related to Work progress, and shall be so organized as to allow sufficient time for transmitting, reviewing, corrections, resubmission, and re-reviewing.

6. Contractor shall coordinate submittal of related items and Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until all related submittals are received by Architect.

7. Contractor shall revise, update and submit submittal schedule to District Representative and Architect on the first of each month, or as required by the District Representative.

8. Contractor shall allow in the Construction Schedule, at least ten (10) calendar days for Architect review following Architect receipt of submittal. For mechanical, plumbing, electrical, structural, and other submittals requiring joint review with Architect's Consultants, and/or others, Contractor shall allow a minimum of fourteen (14) calendar days following Architect receipt of submittal. Submittals will be reviewed with reasonable promptness, but Architect reserves the right of additional time where required based on but limited to submittal size, complexity, etc.

9. No adjustments to the Contract Time and/or Milestones will be authorized because of a failure to transmit submittals to Architect sufficiently in advance of the Work to permit review and processing.

10. In case of product substitution, Shop Drawing preparation shall not commence until such time Architect and District Representative reviews said submittal relative to the General Conditions.

G. If required, resubmit submittals in a timely manner. Resubmit as specified for initial submittal but identify as such. Review times for re-submitted items shall be as per the time frames for initial submittal review.

H. Architect, or authorized agent, will stamp each submittal with a uniform, action stamp. Architect, or authorized agent, will mark the stamp appropriately to indicate the action taken, as follows:

1. Final Unrestricted Release: When Architect, or authorized agent, marks a submittal "Reviewed" the Work covered by the submittal may proceed provided it complies with requirements of the Contract Documents. Final payment depends on that compliance.

2. Final-But-Restricted Release: When Architect, or authorized agent, marks a submittal "Reviewed as Noted" the Work covered by the submittal may proceed provided it complies with notations or corrections on the submittal and requirements of the Contract Documents. Final payment depends on that compliance.

3. Returned for Re-submittal: When Architect, or authorized agent, marks a submittal "Rejected, Revise and Resubmit" do not proceed with Work covered by the submittal, including purchasing, fabrication, delivery, or other activity. Revise or prepare a new submittal according to the notations; resubmit without delay. Repeat as necessary to obtain different action mark. In case of multiple submittals covering same items of Work, Contractor is responsible for any time delays, schedule disruptions, out of sequence Work, or additional costs due to multiple submissions of the same

submittal item. Do not use, or allow others to use, submittals marked "Rejected, Revise and Resubmit" at the Project site or elsewhere where Work is in progress.

4. Other Action: Where a submittal is for information or record purposes or special processing or other activity, the Architect, or authorized agent, will return the submittal marked "Action Not Required".

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

J. All costs for the preparation, correction, delivery, and return of the submittals shall be borne by the Contractor.

3.02 SHOP DRAWINGS

A. Shop Drawings are original drawings prepared by Contractor, Subcontractor, supplier, or distributor illustrating some portion of Work by showing fabrication, layout, setting, or erection details. Do not reproduce Contract Documents or copy standard information as the basis of Shop Drawings. Copies of the Contract Drawing marked to show Shop Drawing information are not acceptable and will be not be reviewed and will be promptly returned to the Contractor.

A. Produce Shop Drawings to an accurate scale that is large enough to indicate all pertinent features and methods. Submit Shop Drawings on sheets at least 8-1/2 x 11 inches but no larger than 30 x 42 inches.

C. Shop Drawings shall include, at a minimum, fabrication and installation drawings, setting diagrams, schedules, patterns, templates, and similar drawings. Include the following information:

1. Dimensions
2. Identification of products and materials included by sheet and detail number.
3. Compliance with specified standards.
4. Notation of coordination requirements.
5. Notation of dimensions established by field measurement.

C. Provide two (2) spaces, approximately 4 by 5 inches, on the label or beside the title block on Shop Drawings to record Contractor and Architect review, and the action taken. Include the following information on the label for processing and recording action taken:

1. Project name.
2. Project number.
3. Date.
4. Name and address of Architect.
5. Name and address of Contractor.
6. Name and address of Subcontractor.
7. Name and address of supplier.

8. Name and address of manufacturer.

9. Name and title of appropriate Specification section.

10. Drawing number and detail references, as appropriate.

E. Submit a sufficient number to allow for adequate Contractor, Subcontractor, supplier, manufacturer and fabricators distribution plus two (2) sets to be retained by Architect, one (1) set to Project Inspector, and one (1) set for the District Representative.

3.03 PRODUCT DATA

A. Collect Product Data into a single submittal for each element of Work or system. Product Data includes printed information, such as manufacturer's installation instructions, catalog cuts, standard color charts, roughing-in diagrams and templates, wiring diagrams, schedules, illustrations, or performance curves.

1. Mark each copy to show or delineate pertinent materials, products, models, applicable choices, or options. Where Product Data includes information on several products that are not required, clearly mark copies to indicate the applicable information. Include the following information:

a. Manufacturer's printed recommendations.

b. Compliance with trade association standards.

c. Compliance with recognized testing agency standards.

d. Application of testing agency labels and seals.

e. Notation of dimensions verified by field measurement.

f. Notation of coordination requirements.

g. Notation of dimensions and required clearances.

h. Indicate performance characteristics and capacities.

i. Indicate wiring diagrams and controls.

2. Do not submit Product Data until compliance with requirements of the Contract Documents has been confirmed.

C. Required Copies and Distribution: Same as denoted in Section 3.02, E.

3.04 SAMPLES

A. Submit Samples of sufficient size, quantity (minimum of three), cured and finished and physically identical to the proposed product or material. Samples include partial or full sections or range of manufactured or fabricated components, cuts or containers of materials, color range sets, and swatches denoting color, texture, and/or pattern.

1. Mount or display Samples in the manner to facilitate review of qualities indicated. Include the following:

a. Specification section number and reference.

b. Generic description of the Sample.

c. Sampling source.

d. Product name or name of manufacturer.

e. Compliance with recognized standards.

f. Availability and delivery time.

2. Submit Samples for review of size, kind, color, pattern, and texture. Submit Samples for a final check of these characteristics with other elements and a comparison of these characteristics between the final submittal and the actual component as delivered and installed.

   a. Where variations in color, pattern, texture, or other characteristic is inherent in the material or product represented, submit at least three (3) multiple units that show the approximate limits of the variations.

   b. Refer to other Specification sections for requirements for Samples that illustrate workmanship, fabrication techniques, assembly details, connections, operation, and similar construction characteristics.

   c. Refer to other sections for Samples to be returned to Contractor for incorporation into the Work. Such Samples must be undamaged at time of installation. On the transmittal indicate special requests regarding disposition of Sample submittals.

   d. Samples not incorporated into the Work, or otherwise not designated as Owner property, remain the property of Contractor and shall be removed from the Project site prior to Substantial Completion.

3. Color and Pattern: Whenever a choice of color or pattern is available in a specified product, submit accurate color chips and pattern charts to Architect for review and selection by Architect and District Representative.

4. Required Copies and Distribution: Same as denoted in Section 3.02, E.

B. When specified, erect field Samples and mock-ups at the Project site to illustrate products, materials, or workmanship and to establish standards by which completed Work shall be judged.

C. Maintain sets of Samples, as returned, at the Project site, for quality comparisons throughout the course of the Work. Sample sets may be used to obtain final acceptance of the Work associated with each set.

3.05 DEFERRED SUBMITTAL REQUIREMENTS

A. Installation of deferred submittal items shall not be started until detailed plans, specifications, and engineering calculations have been: 1) accepted by the Architect or Engineer in general responsible charge of design, 2) signed by a California registered Architect or professional engineer who has been delegated responsibility covering the work shown on a particular plan or specification, and 3) approved by the Division of the State Architect (DSA). Deferred submittal items for this Project are as indicated in the Contract Documents.

B. Deferred submittal drawings and specifications become part of the approved documents for the Project when they are submitted to and approved by DSA.

C. Submit material using submittal process as defined above.

D. Identify and specify all supports, fasteners, spacing, penetrations, etc., for each of the deferred submittal items, including calculations for each and all fasteners.

E. Submit documents to Architect for review prior to requesting that the Architect forward it to the DSA.

F. Documents shall bear the stamp and signature of the Structural, Mechanical, or Electrical Engineer licensed in California who is responsible for that work.

G. Architect and its subconsultants will review the documents only for conformance with design concept. The Architect will then forward the Submittal to DSA for approval.

H. Contractor shall respond to review comments made by DSA and revise and resubmit submittal to the Architect for re-submittal to DSA for final approval.

I.

3.06 QUALITY CONTROL SUBMITTALS

A. Submit quality control submittals, including design data, certifications, manufacturer's field reports, and other quality control submittals as required under other sections of the Contract Documents.

B. When other sections of the Contract Documents require manufacturer's certification of a product, material, and/or installation complies with specified requirements, submit a notarized certification from the manufacturer certifying compliance with specified requirements.

C. Certification shall be signed by an officer of the manufacturer or other individual authorized to sign documents on behalf of the represented company.

D. Requirements for submittal of inspection and test reports are specified in other sections of the Contract Documents.

3.07 CERTIFICATES

A. Submit all certificates in triplicate to Project Inspector, in accordance with requirements of each Specification Section.

END OF SECTION 01 33 00

SECTION 01 45 23 TESTING AND INSPECTION

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Testing and inspection services to meet requirements of California Building Standards Code, Title 24, California Code of Regulations.

B. Tests of materials are required by a DSA certified Testing Agency as set forth in Chapter 4 of the California Administrative Code, Title 24, Part 1.

C. Appendix A: DSA Form 103, Structural Testing & Inspections

1.02 RELATED SECTIONS

A. Division 0.

B. Section 01 31 13: Project Coordination.

C. Section 01 32 13: Construction Schedule.

D. Section 01 33 00: Submittal Procedures.

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

F. Section 01 73 29: Cutting and Patching.

G. Section 01 78 36: Warranty Procedures.

1.03 COORDINATION OF TESTS AND INSPECTIONS

A. Contractor shall establish a protocol for requesting inspections and special inspections so as to not delay the progress of the work. Contractor shall review General Conditions or Construction Services Agreement for additional requirements.

1.04 TESTING COSTS

A. District shall pay for special inspections and testing identified in the Statement of Structural Tests and Special Inspections (DSA FORM 103) except Contractor shall reimburse the District for retesting costs caused by failure of materials to pass initial tests. Contractor shall arrange and pay for all other testing that are specified in other specification sections.

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

i. Contractor's failure to complete the Work within the Contract Time stated in the Agreement, and any previously authorized extensions thereof.

ii. Claims between separate contractors

iii. Covering of any of the Work before the required inspections of tests are performed.

iv. Extra inspections required for Contractor's correction of defective Work.

v. Overtime costs for acceleration of Work done for Contractor's convenience.

1.07 CONTRACTOR-FURNISHED ASSISTANCE

A. When requested, Contractor shall furnish access, facilities, and labor assistance as necessary for duties to be performed at the site by Test Laboratory, and Inspector, including ladders, hoisting, temporary lighting, water, and like services.

PART 2 – PRODUCTS (Not used)

PART 3 – EXECUTION

3.01 SCHEDULES FOR TESTING

A. Establishing Schedule:

1. By advance discussion with the testing laboratory selected by the District Representative, determine the time required for the laboratory to perform its tests and to issue each of its findings.

2. Provide required time within the construction schedule.

B. Revising Schedule: When changes of construction schedule are necessary during construction, coordinate such changes of schedule with the testing laboratory as required.

C. Adherence to Schedule: When the testing laboratory is ready to test according to the determined schedules, but is prevented from testing or taking specimens due to incompleteness of the work, extra charges for testing attributable to the delay may be back-charged to the Contractor and may be deducted by the District Representative from the contract sum.

3.02 REQUESTING TESTING

A. Contractor shall request testing and inspection through the Project Inspector. Contractor shall provide Project Inspector a minimum of forty-eight (48) hour notice prior to Project Inspector inspections being required and a minimum of forty-eight (48) hour notice prior to special testing and inspections being required.

3.03 TESTS

A. District Representative will select and provide an independent DSA certified testing agency (Testing Agency) to conduct tests, sampling, and testing of materials. Selection of material to be tested shall be by the Testing Agency and not by Contractor.

B. The Contractor shall not incorporate into the work any material shipped from the source of supply prior to having satisfactorily passed the required testing and inspection, or prior to the receipt of notice from Project Inspector that the testing and inspection is not required.

C. District Representative will select, and directly reimburse, the Testing Agency for costs of all DSA required tests and inspections; however, the District Representative may be reimbursed by Contractor for such costs as specified or noted in related sections of the Contract Documents.

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

E. The Testing Agency shall not perform any duties of Contractor.

3.04 TEST REPORTS

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

3.05 VERIFICATION OF TEST REPORTS

A. Each Testing Agency shall submit to the Division of the State Architect a verified report covering all tests required to be performed by that Testing Agency during the progress of the Work, in accordance with DSA PR 13-01.

3.06 INSPECTION BY DISTRICT REPRESENTATIVE

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

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

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

3.07 PROJECT INSPECTOR

A. A Project Inspector shall be employed by District Representative in accordance with requirements of Title 24 of the California Code of Regulations with their duties specifically defined therein. Additional DSA certified inspectors may be employed and assigned to the Work by District Representative in accordance with the requirements of California Building Standards Commission's, California Administrative Code with their duties as specifically defined in Section 4-211, 4-219, and 4-238, and in DSA IR A-8.

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

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

3.08 TESTS AND INSPECTIONS

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

1. Lightweight Metal - CBC, Chapter 22A:

a. Materials:

i.	Alloys	2210A.1
ii.	Identification	2210A.1

b. Inspection:

i.	Welding	2211A.2.3

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

a. Materials:

i.	Structural Steel	2205A.1
ii.	Material Identification	2203.A.1

b. Inspection and Tests:

i.	Test of Structural Steel	1704A.3
ii.	Tests of High Strength Bolts,	1704A.3.3; 2212.A.1
iii.	Tests of End Welded Studs	2212A.2
iv.	Shop Fabrication Inspection	1704A.3.1.4
v.	Welding Inspection	1704A.3.1.4
vi.	High Strength Bolt Inspection	1704A.3.3

vii.	Steel Joist Load Tests	1703A.3.2.1
viii.	Spray applied fire resistance materials	1704A.12

END OF SECTION 01 45 23

SECTION 01 50 00 CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Temporary utilities, construction facilities and controls to be provided, maintained, relocated, and removed by Contractor.

1.02 RELATED SECTIONS

A. Division 0.

B. Section 01 11 00: Summary of Work.

C. Section 01 29 73: Schedule of Values Procedures.

D. Section 01 32 13: Construction Schedule.

E. Section 01 45 23: Testing and Inspection.

F. Section 01 57 23: Storm Water Pollution Prevention Plan.

G. Section 01 74 19: Construction and Demolition Waste Management.

PART 2 – PRODUCTS (Not used)

PART 3 – EXECUTION

3.01 QUALITY ASSURANCE

A. Contractor shall comply with applicable laws and regulations of authorities having jurisdiction including, but not limited to, the following:

1. Building Code requirements.

2. Division of State Architect.

3. Health and safety regulations.

4. Utility company regulations.

5. Police, fire department and rescue squad requirements.

6. Environmental protection regulations.

B. Contractor shall arrange for the inspection and testing of each temporary utility prior to use. Obtain required certifications and permits and transmit to District Representative.

3.06 DUST CONTROL

A. Contractor is responsible for dust control on and off the Project site. Contractor shall, on a daily basis, clean all impacted areas to the Districts satisfaction.

3.08 WASTE DISPOSAL

A. Contractor shall remove trash on an ongoing basis. No trash is allowed to collect or stockpile on properly.

3.10 DAILY AND MONTHLY REPORTS

A.. By the end of each workday, Contractor shall submit to District Representative and Project Inspector a daily construction report denoting the daily manpower counts and a brief description/location of the

workday activities. Manpower shall be broken down by trade classification such as foreman, journeyman or apprentice. The report shall also note the date, day of the week, weather conditions, deliveries, equipment on the Project site whether active and/or idle, visitors, inspections, accidents and unusual events, meetings, stoppages, losses, delays, shortages, strikes, orders and requests of governing agencies, Construction Directive and/or Change Orders received and implemented, services disconnected and/or connected, equipment start up or tests and partial use and/or occupancies. Contractor shall also include on the daily construction report the above information for all Subcontractors at whatever tier.

END OF SECTION 01 50 00

SECTION 01 60 00 PRODUCT REQUIREMENTS & SUBSTITUTION PROCEDURES

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Procedures, requirements and limitations for considering substitutions.

B. Criteria for selecting product options and substitutions.

C. Administrative and procedural requirements for selection of products for use in Project;

D. Product delivery, storage, and handling;

E. Manufacturers' standard warranties special warranties;

F. Equivalent products.

G. Substitution requirements and procedures.

1.02 RELATED SECTIONS

A. General and Supplementary Conditions.

B. Section 01 21 00 - Allowances: Products selected under an allowance.

C. Section 01 23 00 - Alternates: Products selected under an alternate.

D. Section 01 33 00 - Submittal Procedures.

E. Section 01 62 11 - Substitution Request Form.

F. Section 01 77 00 - Closeout Procedures.

G. Division 02 through 33 Sections for specific requirements for products in those Sections.

1.03 DEFINITIONS

A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.and Supplementary Conditions.

1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature, that is current as of date of the Contract Documents.

2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.

3. Equivalent Product: Product that is demonstrated and approved through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

B. Basis-of-Design Product Specification: A specification in which a specific manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating equivalent products of additional manufacturers named in the specification.

1.04 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism.

1. Comply with manufacturer's written instructions.
2. Comply with requirements specified in individual Specification Sections.

B. Delivery and Handling:

1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
4. Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.

C. Storage:

1. Store products to allow for inspection and measurement of quantity or counting of units.
2. Store materials in a manner that will not endanger Project structure.
3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
4. Protect foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
5. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
6. Protect stored products from damage and liquids from freezing.

1.05 PRODUCT WARRANTIES

A. Warranties Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

1. Manufacturer's Warranty: Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner.

B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.

1. Manufacturer’s Standard Form: Modified to include Project-specific information and properly executed.
2. Specified Form: When specified forms are included with the Specifications, prepare a written document using indicated form properly executed.
3. See other Sections for specific content requirements and particular requirements for submitting special warranties.

C. Warranty Submittals: Comply with requirements in Section 017700 - Closeout Procedures.

PART 2 – PRODUCTS

2.01 PRODUCT REQUIREMENTS

A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.

1. Comply with General Conditions of the Contract for Construction.
2. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
3. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
4. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
5. Where products are accompanied by the term "as selected," Architect will make selection.
6. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.
7. Provide pricing based on products listed in Contract Documents. Contract award is based on use of specified products or substitutions approved prior to bidding or pricing.
    a. By execution of Contract, Contractor agrees and understands Work will be accomplished with products specified or accepted by substitution.

B. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or an equivalent product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Equivalent Products" Article for consideration of an unnamed product by one of the other named manufacturers.

1. Reference to "Basis of Design" and a named specific product or manufacturer is intended to establish criteria for use of that product and manufacturer based on that products published information whether or not those criteria are explicitly stated in Specifications.
2. Criteria may establish higher performance requirement than specified reference or performance standards. Such reference is intended to establish minimum level of quality, standard of design, function, appearance, type, strength, durability, construction, efficiency, sound level, finish, appearance, availability, service and similar characteristics determined necessary for Project.
3. Specification criteria including basis of design products are considered as a whole.
4. Other products or manufacturers listed meet features, performance, appearance and other criteria established by that product or manufacturer even if product must be customized to meet those criteria.
5. When other products are listed in a Section those products may be used if they meet entire specification criteria including criteria implied by product listed as basis of design. Meeting some requirements but not meeting criteria established by basis of design product does not qualify as meeting specified requirements.
6. Products or manufacturers accepted for substitution will be acceptable provided they fully comply with requirements and match basic and essential criteria of product used for basis of specification or design, including level of fabrication quality, as determined by Architect.

C. Equivalent Products: For products specified by name and accompanied by the term "or equal," or "or approved equal," or "or approved," or “or equivalent product,” comply with requirements in "Product Substitutions Prior to Award" to obtain approval for use of an unnamed product.

D. Visual Matching Specification: Where Specifications require "match Architect's sample", provide a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.

1. If no product available within specified category matches and complies with other specified requirements, comply with requirements in "Product Substitutions" Articles for proposal of product.

E. Visual Selection Specification: Where Specifications include the phrase "as selected by Architect from manufacturer's full range" or similar phrase, select a product that complies with requirements. Architect will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

F. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.

G. Labels, Nameplates and Trademarks: Do not permanently attach or imprint labels or trademarks on surfaces exposed to view when installed, except as follows:

1. Service-Connected or Power-Operated Equipment: Provide permanent nameplate indicating manufacturer, model number, serial number, capacity, speed, electrical characteristics and similar essential operating data.

a. Locate nameplate on easily accessible surface.

2. UL Fire Rating Labels and Other Required Labels: Install on accessible inconspicuous surfaces.

a. Do not paint, deface or conceal required nameplates or labels.

2.02 PRODUCT SUBSTITUTIONS PRIOR TO AWARD

1. Refer to Article 16 of the General Conditions.

2.03 PRODUCT SUBSTITUTIONS AFTER AWARD

A. Intent is to limit unnecessary substitutions after bids. Product substitution after award will not be allowed, except when specified product subsequently is determined as not meeting requirements of Contract Documents or product becomes unavailable, and then only under following conditions:

1. Comply Orders were placed in timely manner. No excuse or proposed substitution will be considered for products due to unavailability unless proof is submitted that firm orders were placed in a timely manner.

2. Reason for unavailability is beyond control of Contractor: prolonged strikes or lockouts which will delay Project to an extent unacceptable to Owner, bankruptcy, discontinuance of a product, delays or Acts of God or other similar reasons.

3. Request for substitution is submitted in writing within 10 days after date Contractor becomes aware product does not comply with specifications or has become unavailable, accompanied by supporting evidence.

4. No extra costs to Owner.

5. Substitution does not compromise design intent or quality required.

6. Substitute product is acceptable to Owner and Architect.

7. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
8. Requested substitution does not require revisions to Contract Documents.
9. Requested substitution is consistent with the Contract Documents and will produce intended and indicated results.
10. Substitution request is fully documented and properly submitted.
11. Requested substitution will not adversely affect Contractor's Construction Schedule.
12. Requested substitution has received necessary approvals of authorities having jurisdiction.
13. Requested substitution is compatible with other portions of Work.
14. Requested substitution has been coordinated with other portions of Work.
15. Requested substitution provides specified warranty.
16. If requested substitution involves more than one trade, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to installers involved.

B. Substitution Request Submittals: Clearly define and describe proposed substitute product including following items:
    1. Fully completed Section 016211 - Substitution Request Form.
    2. Manufacturer's printed information supporting claim that proposed product meets specified requirements. Provide following as applicable:
        a. Literature Specifications Drawings Cut Sheets Performance data
        b. List of reference projects of similar size, value and complexity Model numbers Other information necessary to completely describe item.
    3. Provide a point by point comparison between key features of specified Basis of Design item and proposed substitution.
    4. Provide submitted materials marked with Article and Paragraph references from Specification using highlighter, marker and flags on pages to facilitate review and show that substitution meets specified requirements.
    5. Provide a letter indicating requestor has reviewed Contract Documents and examined site (if needed) and that proposed substitution meets specified requirements.
C. Accepted substitutions will be published in writing. No information or indication of acceptance will be provided by means other than Architect’s written Change Directive document following bidding.
D. Bid and construct according to Contract Documents unless approval of substitution is provided in writing.
E. Architect is not obligated to state reasons for rejecting substitution.
F. Substitute products shall:
    1. When references to Federal Specification, ASTM Standard, American National Standards Institute (ANSI) or similar association standards are listed for product quality, provide an acceptable affidavit certifying that proposed substitution for this Project meets with same standard.
    2. Submit supporting test data to substantiate compliance.
G. Reference Standards for Products:

1. When references to Federal Specification, ASTM Standard, American National Standards Institute (ANSI) or similar association standards are listed for product quality, provide an acceptable affidavit certifying that proposed substitution for this Project meets with same standard.
2. Submit supporting test data to substantiate compliance.

H. Contractor, supplier or manufacturer providing accepted substitute product shall bear cost of required modifications to spaces, services, utilities and other features as result of accepting substitute products, including but not limited to:

1. Larger capacity mechanical or electrical service, devices or utilities resulting from acceptance of product for bidding purposes.
2. Modification to pipes, conduits, ducts, and controls for conveying, distributing, and controlling those services or utilities.
3. Modification to insulation, wrappings, coatings, or other integral features of lines or items conveying those lines.

I. Campatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests recommended by manufacturers.

PART 3 EXECUTION – Not Used

END OF SECTION 01 60 00

SECTION 01 62 11 SUBSTITUTION REQUEST FORM

To: RSCCD

From:
Contact: _____
Email: _____
Phone: _____

Owner: RSCCD – Santa Ana College **Submittal Date:** _____

Project: Russell Hall Replacement (Health Sciences) **Previous Date:** _____

PROPOSED SUBSTITUTION

Specification Section, Article, Paragraph: _____

Applicable Drawing & Details: _____

Proposed Substitution: _____

Manufacturer: _____

Product/Model: _____

REASON FOR SUBSTITUTION REQUEST

☐ Specified product is not available. Explain: _____

☐ Other: _____

_____

EFFECTS OF PROPOSED SUBSTITUTION

Does substitution affect dimensions indicated on Drawings?

☐ NO ☐ YES Explain: _____

Does substitution affect Work of other Sections?

☐ NO ☐ YES Explain: _____

Does substitution require modifications to design, changes to Drawings, or revisions to specifications to be incorporated into the Project?

☐ NO ☐ YES Explain: _____

CONTRACTOR'S REPRESENTATION

Undersigned accepts responsibility for coordination of proposed substitution and accepts all additional costs resulting from the incorporation of proposed substitution into the Project per Section 016000.

Subcontractor

Signature: _____

Date: _____

DISTRICT/ARCHITECT'S REVIEW

☐ Accepted

☐ Not Accepted

Contractor

Signature: _____

Date: _____

Reviewer: _____

Review Date: _____

SECTION 01 71 23 FIELD ENGINEERING

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Layout of the work.

B. Verification of work.

1.02 RELATED SECTIONS

A. General Conditions.

B. Section 01 11 00: Summary of Work.

C. Section 01 31 13: Project Coordination.

D. Section 01 32 13: Construction Schedule.

E. Section 01 33 00: Submittal Procedures.

F. Section 01 77 00: Contract Closeout.

1.03 SURVEY CONTROLS

A. Vertical and horizontal control shall use same benchmark used in the preparation of topographic survey. When Work consists of both on-site and off-site and benchmarks differ, an equation shall be indicated on Drawings.

1.04 LAYOUT OF WORK

A. All work related to staking shall be by a Land Surveyor or Civil engineer registered with the State of California to perform land surveying and employed by Contractor.

B. Before commencement of Work, Land Surveyor shall locate all reference points and benchmarks to be used for vertical and horizontal control.

C. Land Surveyor shall lay out entire Work, set grades, lines, levels, control points, elevations, grids and positions.

1.05 VERIFICATION OF WORK

A. All curb and gutter, sidewalks, pavers, ramps, concrete flatwork, and asphalt will be subject to line and grade certification. This task shall be performed by a licensed Land Surveyor in the State of California, employed by the Contractor, and shall certify that:

1. The forms for all curb and gutter, sidewalks, pavers, ramps, concrete flatwork, and asphalt are within conformance of the Contract Documents and that no rates of grade are in excess of the rates of grade shown on the approved precise grading plan. These certifications shall be signed by the Land Surveyor and submitted to the District Representative, Architect, and Project Inspector forty-eight (48) hours prior to concrete pour or product placement.

2. The as-built conditions for all curb and gutter, sidewalks, pavers, ramps, concrete flatwork, and asphalt are within conformance of the Contract Documents and that no rates of grade are in excess of the rates of grade shown on the approved precise grading plan. These certifications shall be signed by the Land Surveyor and submitted and approved by the District prior to the finalization of the project.

B. All of the above certifications shall be performed at the contractor’s expense and the District reserves the right to use an outside consultant to verify any work that the Project Inspector deems necessary in order to ensure compliance with the above specifications.

1.06 SUBMITTALS

A. Land Surveyor: Shall submit name, address and license number to District Representative, including any changes as they occur.

B. Field notes: Upon request by District Representative, submit copies of cut sheets, coordinate plots, data collector printouts, marked-up construction staking plans and other documentation as available to verify accuracy of field engineering work during and at completion of project. Submittals to District Representative must be signed and sealed by Surveyor and counter-signed by Contractor

C. Statement of Compliance: Contractor shall submit a statement of certification signed and sealed by Land Surveyor, counter-signed by Contractor indicating compliance with grades and alignment of construction plans at rough grade, fine grade, and top of rock stages. Project Inspector shall review survey submittals for each stage of construction prior to proceeding with Work.

D. Upon Substantial Completion, Contractor shall obtain and pay for reproducible survey drawings (or "As Built").

E. Completed record drawings shall be signed and certified as correct and within specified tolerances by licensed Land Surveyor. Originals and two sets of blueprints shall be submitted to District Representative.

1.07 RECORD DOCUMENTS

A. Maintain complete and accurate log of all control and survey documentation as work progresses.

B. Record, by coordinates, all new underground utilities outside building perimeter with top of pipe elevations, at major grade and alignment changes, rim, grate or top of curb and flow line elevations of all drainage structures and sewer manholes. For groups of conduits encased in a duct bank, provide coordinates and elevations of duct bank encasement

C. Indicate reference and control points on record drawings. The basis of elevation shall be one of the established benchmarks.

D. Upon Substantial Completion, obtain and pay for reproducible plans and provide to District Representative. Clearly indicate all differences between original drawings and completed work within specified tolerances. In addition, provide AutoCAD files of each survey performed for District records.

PART 2 – PRODUCTS (Not used)

PART 3 – EXECUTION

3.01 PREPARATION

A. Pre-mark areas of excavation in accordance with the requirements of "Dig-Alert". Request locators two (2) days before commencing excavation.

B. Before commencing Work, establish all horizontal and vertical reference points used in Contract Documents according to existing field conditions.

C. Preserve established reference lines and benchmarks.

D. Differentiate school and city datum as applicable.

E. Relocate bench marks that may interfere with Work.

F. Reset and re-establish reference marks damaged or lost during construction.

3.02 SURVEY REQUIREMENTS GENERAL

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

B. Indicate reference points, relative to benchmark elevation, on record drawings.

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

D. Calculate and layout proposed finished elevations and intermediate controls, as required, to provide smooth transitions between spot elevations indicated on Drawings.

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

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

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

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

I. Submit a certification signed by the Land Surveyor confirming the elevations and locations of improvements are in conformance with the Contract Documents. The statement shall include survey notes for the finish floor and building pad, showing the actual measured elevations on the completed sub-grade, recorded to the nearest 0.01 of a foot. Building pad tolerance will be plus or minus 0.1 of a foot.

J. Mark boundaries for rights-of-way dedications and easements for utilities prior to making location of buildings and utilities.

K. Layout all lines, elevations, and measurements needed for construction or installation of buildings, grading, paving utilities according to the following:

1. Identify site boundary, property lines.
2. Provide working benchmarks.
3. Set stakes for Bottom of Excavated Plane (B.E.P.).
4. Set gridlines, radii, working points etcetera, for foundation.
5. Set and verify building pad elevations.
6. Set finish floor elevations.
7. Stake location and elevations for exterior ramps and stairs.
8. Set gridlines, radii, working points, etc, for all floors of multi-story buildings.
9. Set storm drain and sanitary sewer inverts and other utilities as needed at 5-foot off-set from building lines.
10. For new facilities, establish permanent onsite Benchmark with 2-inch diameter brass disk. Location of Benchmark to be determined by District Representative.

3.03 SURVEY REQUIREMENTS FOR GRADING

A. Provide grade stakes and elevations as follows:

1. Removal limits (cut lines).
2. Rough grade staking: 60-foot maximum grid plus additional stakes at grade changes and pertinent locations. Flag all grade changes including ridges, flow lines and grade breaks.
3. Fine grade for top of dirt: 30-foot maximum grid plus additional stakes at grade changes and pertinent locations. Flag all grade changes including ridges, flow lines and grade breaks.

4. Verify fine grade for top of rock: 30-foot maximum grid plus additional stakes at grade changes and pertinent locations. Flag all grade changes including ridges, flow lines and grade breaks.

5. Finish grade marks on all buildings, structures and at pertinent locations.

6. Finish grades and offsets for all concrete work, flatwork, sidewalks, pavers, curbs and gutters, asphalt, utilities, landscape areas, and structures.

7. Provide controls and baselines for playground striping.

8. Offsite improvements: set grades and provide grade sheets as required by local authorities.

B. Provide a minimum of two permanent horizontal and vertical control points onsite, remote from building area, referenced to data established by survey control points.

3.04 SURVEY REQUIREMENTS FOR UTILITIES

A. Locate “wet” utility lines and provide vertical control proportionate to slope of line as required for accurate construction. “Dry” utilities shall have adequate horizontal and vertical control layout supplied by others.

B. Prior to back-filling trench, survey and record invert and flow line elevations. Survey and record top of curb and flow line elevations on finished surfaces at key locations (such as Back of Curbs, grade breaks, corners or angle points) in sufficient number to demonstrate Work complies with intent of Contract Documents.

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

1. Set grades for vaults one inch higher than adjacent surrounding design grades, unless noted otherwise.

D. Leave all trenches open until required inspection is completed.

3.05 SURVEY REQUIREMENTS FOR STRUCTURES

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

B. Submit a certification signed by Land Surveyor confirming elevations and locations of improvements are in conformance with Contract Documents. Statement shall include survey notes for finish floor and building pad, showing actual measured elevations on completed sub-grade, recorded to nearest 0.01 of a foot. Building pad tolerance will be plus or minus 0.1 of a foot.

END OF SECTION 01 71 23

SECTION 01 73 29 CUTTING AND PATCHING

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. This Section specifies procedural requirements for cutting and patching.

1.02 RELATED SECTIONS

A. Construction Services Agreement.

B. Section 01 29 73: Schedule of Values Procedures.

C. Section 01 31 13: Project Coordination.

D. Section 01 31 19: Project Meetings.

E. Section 01 32 13: Construction Schedule.

F. Section 01 33 00: Submittal Procedures.

G. Section 01 71 23: Field Engineering.

H. Section 01 78 36: Warranty Procedures.

1.03 SUBMITTALS

A. The word "cutting" as used in the Contract Documents includes, but is not limited to, cutting, drilling, chopping, and other similar operations and the word "patching" includes, but is not limited to, patching, rebuilding, reinforcing, repairing, refurbishing, restoring, replacing, or other similar operations.

B. Cutting and Patching Proposal: Contractor shall submit a work plan describing procedures well in advance of the time cutting and patching will be performed if the Contract Documents requires approval of these procedures before proceeding. Include the following information, as applicable, in the work plan:

1. Describe the extent of cutting and patching required. Denote how it will be performed and indicate why it cannot be avoided.

2. Describe anticipated results in terms of changes to existing construction. Include changes to structural elements and operating components as well as changes in the building's appearance or other significant visual elements.

3. List products to be used and firms or entities that will perform this Work.

4. Indicate dates when cutting and patching will be performed.

5. Utilities: List utilities that cutting and patching operations will disturb or affect. List utilities to be relocated and those that will be temporarily out-of-service. Indicate how long service will be disrupted.

6. Where cutting and patching involves adding reinforcement to structural elements, submit details and engineering calculations showing integration of reinforcement with the original structure.

7. Review by Architect and DSA prior to proceeding with cutting and patching does not waive Architect right to later require complete removal and replacement of defective Work.

1.04 QUALITY ASSURANCE

A. Requirements for structural Work: Do not cut and patch structural elements in a manner that would change their load-carrying capacity or load-deflection ratio.

1. Obtain approval from Architect and DSA of the cutting and patching work plan before cutting and patching the following structural elements:

a. Foundation construction.

b. Bearing and retaining walls.

c. Structural concrete.

d. Structural steel.

e. Lintels.

f. Timber and primary wood framing.

g. Structural decking.

h. Stair systems.

i. Miscellaneous structural metals.

j. Exterior curtain-wall construction.

k. Equipment supports.

l. Piping, ductwork, vessels, and equipment.

m. Any other structural systems not listed above.

B. Operational Limitations: Do not cut and patch operating elements or related components in a manner that would result in reducing their capacity to perform as intended. Do not cut and patch operating elements or related components in a manner that would result in increased maintenance or decreased operational life or safety.

1. Obtain review of the cutting and patching work plan before cutting and patching the following operating elements or safety related systems:

a. Primary operational systems and equipment.

b. Air or smoke barriers.

c. Water, moisture, or vapor barriers.

d. Membranes and flashings.

e. Fire protection systems.

f. Noise and vibration control elements and systems.

g. Control systems.

h. Communication and/or data systems.

i. Conveying systems.

j. Electrical wiring systems.

k. Any other operating systems not listed above.

C. Visual Requirements: Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in the opinion of Architect, reduce the building's aesthetic qualities. Do not cut and patch construction in a manner that would result in visual evidence of cutting and patching. Remove and replace Work cut and patched in a visually unsatisfactory manner.

1.05 WARRANTY

A. Existing Warranties: Replace, patch, and repair material and surfaces cut or damaged by methods and with materials in such a manner as not to void any warranties required or existing.

PART 2 – PRODUCTS (Not applicable)

PART 3 – EXECUTION

3.01 INSPECTION

A. Examine surfaces to be cut and patched and conditions under which cutting and patching is to be performed before cutting. If unsafe or unsatisfactory conditions are encountered, take corrective action before proceeding.

1. Before proceeding, meet at the Project site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

3.02 PREPARATION

A. Temporary support: Provide adequate temporary support of existing improvements or Work to be cut.

B. Protection: Protect existing improvements and Work during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of existing improvements or Work that might be exposed during cutting and patching operations.

C. Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

D. Where the Work requires sandblasting of existing surfaces in order to receive new materials secured by cementitious, adhesive or chemical bond, completely remove existing finishes, stains, oil, grease, bitumen, mastic and adhesives or other substances deleterious to the new bonding or fastening of new Work. Utilize wet sand blasting for interior surfaces and for exterior surfaces where necessary to prevent objectionable production of dust.

3.03 PERFORMANCE

A. General: Employ skilled workmen to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time and complete without delay. Carefully remove existing Work to be salvaged and/or reinstalled. Protect and store for reuse into the Work. Verify compatibility and suitability of existing substrates before starting the Work.

B. Cutting: Cut existing construction using methods least likely to damage elements retained or adjoining Work. Where possible, review proposed procedures with the original installer; comply with the original installer's recommendations.

1. In general, where cutting, use hand or small power tools designed for sawing or grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.

C. Patching: Patch with durable seams that are as invisible as possible. Comply with required tolerances.

1. Where feasible, inspect and test patched areas to demonstrate integrity of the installation. Verify conditions of existing substrates prior to executing Work.

2. Restore exposed finishes of patched areas and extend finish restoration into retaining adjoining construction in a manner that will eliminate all evidence of patching and refinishing.

3. Non-Structural Concrete Flatwork: Finish placed concrete to match existing unless noted otherwise. Concrete shall have a compressive strength of 2,500 psi where installed to repair and match existing improvements, unless noted otherwise.

4. Metal Fabrications: Items to remain exposed shall have their edges cut and ground smooth and rounded.

5. Sheet Metal: Replace removed or damaged sheet metal items for new Work.

6. Glass: Install matching glass and re-seal exterior window assemblies.

7. Lath and Plaster: Install new lath materials to match existing and fasten to supports at 6-inch centers. Provide a 6-inch lap where new lath adjoins existing lath. Fasten new lath as required for new Work. Restore paper backings as required. Apply a bonding agent on cut edges of existing plaster. Apply three coat plaster of the type, thickness, finish, texture, and color to match existing.

8. Gypsum: Fasten cut edges of wallboard. Install patches with at least two opposite edges centered on supports and secure at 6-inch centers. Tape and finish joints and fastener heads. Patching shall be non-apparent when painted or finished.

9. Acoustical Ceilings: Comply with the requirements for new Work specified in related sections of the Contract Documents.

10. Resilient Flooring: Completely remove flooring and prepare substrate for new material.

11. Painting: Prepare areas to be patched, patch and paint as specified under related sections of the Contract Documents.

3.04 CLEANING

A. Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar items. Thoroughly clean piping, conduit, and similar features before applying paint or other finishing materials. Restore damaged coverings to their original condition.

END OF SECTION 01 73 29

SECTION 01 74 19 CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes: Preparation and implementation, including reporting and documentation, of a Waste Management Plan for reusing, recycling, salvage or disposal of non-hazardous waste materials generated during demolition and new construction (Construction and Demolition (C&D) Waste), to foster material recovery and re-use and to minimize disposal in landfills.

1.02 RELATED SECTIONS

A. General Conditions.

B. Section 01 32 29: Project Forms.

C. Section 01 33 00: Submittal Procedures.

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

1.03 REFERENCES

A. California Integrated Waste Management Act (IWMA) of 1989 (AB 939).

B. California Code of Regulations Title 14, Section 18700 et seq.

C. California Green Building Standards Code, Part 11 of Title 24.

1.04 SYSTEM DESCRIPTION

A. Collection and separation of all C&D waste materials generated on-site, reuse or recycling on-site, transportation to approved recyclers or reuse organizations, or transportation to legally designated landfills, for the purpose of recycling salvaging and reusing a minimum of 75% of the C&D waste generated.

1.05 SUBMITTALS

A. Per Section 01 32 29, Contractor to provide a C&D Waste Management Plan within ten (10) calendar days after the Notice to Proceed and prior to any waste removal. Submit the following to the District Representative for review and approval:

1. Materials to be recycled, reused, or salvaged, either onsite or offsite.

2. Estimates of C&D waste quantity (in tons) by type of material. (If waste is measured by volume, give factors for conversion to weight in tons.)

3. Procedures for recycling and reuse program.

4. Permit or license and location of Project waste-disposal areas.

5. Site plan for placement of waste containers.

B. Per Section 01 32 29, Contractor to provide a C&D Waste Management Monthly Progress Report, summarizing waste generated by Project and submitted monthly with Application for Payment. Include:

1. Firm(s) accepting the recovered or waste materials.

2. Type and location of accepting facilities (landfill, recovery facility, used materials yard, etcetera). If materials are reused or recycled on the Project site, location should be designated as “on-site reuse and recycling”.

3. Type of materials and net weight (tons) of each.

4. Value of the materials or disposal fee paid.

5. Attach weigh bills and other documentation confirming amount and disposal location of waste materials.

C. C&D Waste Management Final Compliance Report: Final update of Waste Management Plan to provide summary of total waste generated by Project.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION

3.01 IMPLEMENTATION

A. Implement approved Waste Management Plan including collecting, segregating, storing, transporting and documenting each type of waste material generated, recycled or reused, or disposed in landfills.

B. Designate an on-site person to be responsible for instructing workers and overseeing the sorting and recording of waste/recyclable materials.

C. Include waste management and recycling in worker orientation and as an agenda item for regular Project meetings.

D. Recyclable and waste bin areas shall be limited to areas approved on the Waste Management Plan. Keep recycling and waste bins neat and clearly marked to avoid contamination of materials.

END OF SECTION 01 74 19

SECTION 01 77 00 CONTRACT CLOSEOUT

PART 1 – GENERAL

1.01 SECTION INCLUDES

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

1. Inspection procedures.
2. Project record documents submittal.
3. Operation and maintenance manual submittal.
4. Owner orientation and instruction.
5. Final cleaning.

1.02 RELATED SECTIONS

A. Section 01 29 76: Progress Payment Procedures.

B. Section 01 32 13: Construction Schedule.

C. Section 01 32 29: Project Forms.

D. Section 01 33 00: Submittal Procedures.

E. Section 01 45 25: Testing, Adjusting, and Balancing of HVAC.

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

G. Section 01 74 19: Construction Demolition and Waste Management.

H. Section 01 78 36: Warranties.

1.03 REQUIREMENTS FOR PREPARATORY FINAL INSPECTION

A. All contract work completed.

B. Remove temporary facilities from the Project site.

C. Thoroughly clean the Buildings and Project site.

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

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

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

G. Submit to the District Representative, the material and equipment maintenance instructions, as specified in the body of the Specification Sections.

H. Submit to the District Representative, all warranties, guarantees, and bonds, as specified in the body of the Specification Sections.

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

J. Deliver all tools which are a permanent part of equipment installed in the Work to the District Representative.

K. Deliver all keys, construction and permanent, properly identified, to the District Representative.

L. Deliver all extra stock items, as directed by the District Representative, to a location within the District.

M. Contractor determined the Work has been completed. All life safety items are completed and in working order.

N. Electrical circuits scheduled in panels and disconnect switches labeled.

O. Grounds cleared of Contractor's equipment, raked clean of debris, and trash removed from Site.

P. Work cleaned, free of stains, scratches, marks, dirt, superfluous labels, and other foreign matter, replacement of damaged and broken material.

Q. Finished and decorative work shall have marks, dirt and superfluous labels removed.

R. Final cleanup complete.

PART 2 – PRODUCTS (Not used)

PART 3 – EXECUTION

3.01 SUBSTANTIAL COMPLETION

A. Inspection Procedures: After all requirements preparatory to the final inspection have been completed, as herein specified in the Specification Sections, the Contractor will notify the District Representative, Architect, and Project Inspector to perform the final inspection.

1. If after inspection of the Work, District Representative does not consider the Work complete, District Representative will notify Contractor.

2. If after inspection, District Representative considers the Work complete, Architect shall prepare a Punch List of items to be corrected.

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

1. Upon completion of inspection, District Representative will recommend Final Completion. If the Work is incomplete, District Representative will advise Contractor of Work that is incomplete or of obligations that have not been fulfilled but are required for Final Completion.

2. If necessary, re-inspection will be repeated, but may be assessed against Contractor if Owner is subject to additional professional service and or additional costs of inspection.

3.02 PROJECT RECORD DOCUMENT SUBMITTAL

A. General: Do not use project record documents for construction purposes. Protect record documents from deterioration and loss. Provide access to record documents for Architect, Project Inspector, and District Representative reference during normal working hours. Project record document shall be updated on a daily basis prior to work being concealed. Prior to submitting each application for payment, secure Project Inspector approval of project record documents.

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

1. Mark record sets with red erasable pencil. Use other colors to distinguish between variations in separate categories of the Work. Date and number entries in the same format as submitted. Call attention to entry by a "cloud" around the affected areas.

2. Mark new information important to Owner but was not shown on Drawings or Shop Drawings.

3. Utility mainlines and duct-banks within the building footprint shall be indicated by location and depth below finished grade. All utilities and above ceilings and attic spaces shall be fully dimensioned and indicated on record drawings. Dimensions shall be measured from building lines or permanent landmarks and shall be triangulated to those features.

4. Note related Change Order or Construction Directive numbers where applicable. RFI submissions shall be referenced on each affected sheet, Drawing and Shop Drawing.

5. Organize record drawing sheets into manageable sets. Bind sets with durable-paper cover sheets; print suitable titles, dates, and other identification on the cover of each set.

6. Prior to Contract Completion of the Work, review of the project record drawings by Architect; prepare a final set of project record drawings and submit to Architect.

C. Record Specifications: Maintain one (1) complete copy of the Specifications, including Addenda. Include with the Specifications two copies of other written Contract Documents, such as Change Orders or Construction Directives issued during construction.

1. Mark these record documents to show substantial variations in actual Work performed in comparison with the text of the Specifications and modifications.

2. Give particular attention to substitutions and selection of options and information on concealed Work that cannot otherwise be readily discerned later by direct observation.

3. Note related record document information with Product Data.

4. Prior to Contract Completion of the Work, submit record Specifications to Architect for Owner records.

D. Record Samples: Immediately prior to Substantial Completion, Contractor shall meet with Architect and District Representative at the Project site to determine which Samples are to be transmitted to Owner for record purposes. Comply with District Representative instructions regarding delivery to Owner storage area.

E. Miscellaneous Records: Refer to other Specification sections for requirements of miscellaneous record keeping and submittals in connection with actual performance of the Work. Prior to the date of Contract Completion, complete and compile miscellaneous records and place in good order. Identify miscellaneous records properly and bind or file, ready for continued use and reference. Submit to Architect for Owner records.

F. Maintenance Manuals: Shall be submitted and approved by the Architect prior to commissioning and startup of the corresponding system/product. Organize operation and maintenance data into suitable three (3) sets of manageable size. Bind properly, indexed data in individual, heavy-duty, three-inch 3-ring, vinyl-covered binders, with pocket folders for folded sheet information. Mark appropriate identification on front and spine of each binder. Provide a table of contents in front and all items shall be indexed with tabs. Each manual shall also contain a list of subcontractors, with their scope of work, addresses, phone numbers, email, and the names of persons to contact in cases of emergency. Identifying labels shall provide names of manufactures, their addresses, ratings, and capacities of equipment and machinery. Submit to Architect for Owner records. Include the following types of information.

1. Table of Contents (in each binder)

2. Emergency instructions.

3. Spare parts list.

4. Copies of warranties.

5. Wiring diagrams.

6. Recommended “turn-around” cycles.

7. Inspection procedures.

8. Shop Drawings and Product Data.

9. Fixture lamping schedule.

10. Note which items also have video training.

G. Provide one (1) electronic version of all documents listed above on one (1) flash drive to the District Representative.

3.03 OPERATION AND MAINTENANCE:

A. Operation and Maintenance Instructions: Prior to Substantial Completion, arrange for each installer of equipment that requires regular operation and maintenance to meet with designated Owner personnel to provide instruction in proper operation and maintenance. Provide instruction by manufacturer's representatives if installers are not experienced in operation and maintenance procedures. Include a detailed review of the following items:

1. Maintenance manuals.

2. Spare parts and materials.

3. Tools.

4. Lubricants.

5. Fuels.

6. Identification systems.

7. Control sequences.

8. Hazards.

9. Cleaning.

10. Warranties and bonds.

11. Maintenance agreements and similar continuing commitments.

B. As part of instruction for operating equipment, demonstrate the following procedures:

1. Start-up.

2. Shutdown.

3. Emergency operations.

4. Noise and vibration adjustments.

5. Safety procedures.

6. Economy and efficiency adjustments.

7. Effective energy utilization.

C. Notice of Termination: Contractor shall submit a Notice of Termination (NOT) to the District for District issuance to the local Regional Water Quality Control Board (RWQCB). Provide a copy of NOT to District Representative.

3.04 FINAL CLEANING

A. General: The Contractor shall be solely responsible for all cleaning operations during the Project.

B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to the condition expected in a normal, commercial building cleaning and maintenance program. Comply with manufacturer's instructions.

1. Complete the following cleaning operations before requesting inspection for a certificate of Substantial Completion.

a. Remove labels that are not permanent labels.

b. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other substances that are noticeable vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials.

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

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

e. Clean the Project site, including landscape development areas, of rubbish, litter, and other foreign substances. Sweep paved areas broom clean; remove stains, spills, and other foreign deposits. Rake grounds that are neither paved nor planted to a smooth, even-textured surface.

f. Complete the final filter change replacing all HVAC filters.

END OF SECTION 01 77 00

SECTION 01 78 36 WARRANTY PROCEDURES

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. This Section includes procedural requirements for warranties, including manufacturers and installer's standard warranties on products and special product warranties.

1.02 RELATED SECTIONS

A. General Conditions.

B. Section 01 32 29: Project Forms

C. Section 01 73 29: Cutting and Patching.

D. Division 2 through Division 32.

1.03 SUBMITTALS

A. Form of Submittal: In accordance with the General Conditions compile two (2) copies of each required final warranty properly executed by Contractor, or by Contractor and Subcontractor, installer, supplier, or manufacturer. Organize the warranty documents into an orderly sequence based on the Specifications and provide a table of contents.

B. Bind warranties and bonds in heavy-duty, commercial-quality, durable three ring, vinyl-covered loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8½ by 11 paper.

1. Provide heavy paper dividers with celluloid covered tabs for each separate warranty. Mark the tab to identify the item or installation. Provide a typed description of the product or installation, including the name of the product, and the name, address, and telephone number of the installer.

2. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project title and/or name, and name of Contractor.

3. When warranted Work requires operation and maintenance manuals, provide additional copies of each required warranty, as necessary, for inclusion in each required manual.

C. Provide one (1) electronic version of all documents listed above on one (1) flash drive to the District Representative.

D. Provide a Warranty Guarantee Form on the District's form provided in Section 01 32 29 as part of the Closeout documentation.

PART 2 – PRODUCTS (Not applicable)

PART 3 – EXECUTION (Not applicable)

END OF SECTION 01 78 36

SECTION 23 07 19 HVAC PIPING INSULATION

SCHEDULE 0 - RELATED DOCUMENTS

PRODUCT DATA SHEET 0 - Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

SCHEDULE 1 - SUMMARY

PRODUCT DATA SHEET 0 - Section includes insulating the following HVAC piping systems:

1.1 Heating hot-water piping.

SCHEDULE 2 - SUBMITTALS

PRODUCT DATA SHEET 1 - The Contractor, manufacturer, or vendor shall resubmit this specification section showing compliance with each respective paragraph and specified items in this section. All exceptions shall be clearly identified by referencing the respective paragraph and other requirements. Next to each specification item, indicate the following:

1.1 "No Exceptions Taken."
1.2 "Exception." All exceptions shall be clearly identified by referencing respective paragraph and other requirements along with the proposed alternative.

PRODUCT DATA SHEET 2 - Product Data: For each type of product indicated. Include thermal conductivity, water-vapor permeance, thickness, and jackets (both factory and field applied, if any). Clearly mark the materials being provided and its intended use of each product

SCHEDULE 3 - INFORMATIONAL SUBMITTALS

PRODUCT DATA SHEET 0 - Qualification Data: For qualified Installer.

PRODUCT DATA SHEET 1 - Field quality-control reports if requested by the Owner's Representative.

SCHEDULE 4 - QUALITY ASSURANCE

PRODUCT DATA SHEET 0 - Insulation materials shall be manufactured at facilities certified and registered with an approved registrar to conform to the ISO 9001 Quality Standard.

PRODUCT DATA SHEET 1 - All work shall conform to accepted industry and trade standards for commercial and industrial insulations and shall conform with manufacturer's recommendations.

PRODUCT DATA SHEET 2 - Installation shall be by licensed applicators.

PRODUCT DATA SHEET 3 - Insulation materials that have become wet or contaminated shall not be installed.

PRODUCT DATA SHEET 4 - Surface-Burning Characteristics: For insulation and related materials, as determined by testing identical products according to ASTM E 84, by a testing and inspecting 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.

1.1 Insulation Installed Indoors: Flame-spread index of 25 or less, and smoke-developed index of 50 or less.
1.2 Insulation Installed Outdoors: Flame-spread index of 75 or less, and smoke-developed index of 150 or less.

SCHEDULE 5 - DELIVERY, STORAGE, AND HANDLING

PRODUCT DATA SHEET 0 - Deliver all materials (insulation, coverings, tapes, cements, adhesives, coatings, etc.) to the jobsite in factory containers with manufacturer’s label showing manufacturer, product name and product hazard information.

PRODUCT DATA SHEET 1 - Insulation shall be delivered to the job site in original, unopened manufacturer’s containers.

PRODUCT DATA SHEET 2 - Insulation shall be stored in a dry location and kept dry throughout construction. Wet or damaged insulation shall be removed and replaced by the Contractor at no additional cost.

SCHEDULE 6 - COORDINATION

PRODUCT DATA SHEET 0 - Coordinate sizes and locations of supports, hangers, and insulation shields specified in Section 23 05 29 "Hangers and Supports for HVAC Piping and Equipment."

PRODUCT DATA SHEET 1 - Coordinate clearance requirements with piping Installer for piping insulation application. Before preparing piping Shop Drawings, establish and maintain clearance requirements for installation of insulation and field-applied jackets and finishes and for space required for maintenance.

SCHEDULE 7 - SCHEDULING

PRODUCT DATA SHEET 0 - Schedule insulation application after pressure testing systems. Insulation application may begin on segments that have satisfactory test results.

PART 2 - PRODUCTS

SCHEDULE 0 - INSULATION MATERIALS

PRODUCT DATA SHEET 0 - Products shall not contain CFC, asbestos, lead, mercury, or mercury compounds.

PRODUCT DATA SHEET 1 - Insulation shall meet fire and smoke hazard ratings as tested under procedure ASTM E-84, NFPA 255, and UL 723 and shall not exceed flame spread rating of 25 and maximum smoke developed rating of 50.

PRODUCT DATA SHEET 2 - Phenolic Pipe Insulation:

2.1 Products: Subject to compliance with requirements, provide one of the following:

A. Dyplast Products. Dytherm Phenolic
B. Resolco Inc. Insul-Phen Green.
C. Polyguard.

2.2 Preformed pipe insulation of rigid, expanded, closed-cell structure. Comply with ASTM C 1126, Type III, Grade 1.
2.3 Block insulation of rigid, expanded, closed-cell structure. Comply with ASTM C 1126, Type II, Grade 1.
2.4 Thermal conductivity (k-value): 0.18 Btu-in/hr-ft^2-°F at 75°F
2.5 Factory fabricate shapes according to ASTM C 450 and ASTM C 585

SCHEDULE 1 - ADHESIVES

PRODUCT DATA SHEET 0 - 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. Adhesives shall contain no flammable solvents if that option is available.

PRODUCT DATA SHEET 1 - ASJ Adhesive, and FSK Jacket Adhesive: Comply with MIL-A-3316C, Class 2, Grade A for bonding insulation jacket lap seams and joints.

2.1 Products: Subject to compliance with requirements, provide one of the following:

A. Design Polymerics DD2590-CA.
B. ITW TACC, Division of Illinois Tool Works; SP80, T1080
C. Marathon Industries, Inc.

2.2 For indoor applications use adhesive that has a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

PRODUCT DATA SHEET 2 - PVC Jacket Adhesive: Compatible with PVC jacket.

2.1 Products: Subject to compliance with requirements, provide one of the following:

A. Dow Chemical Company (The); 739, Dow Silicone.
B. Johns-Manville; Zeston Perma-Weld, CEEL-TITE Solvent Welding Adhesive.
C. P.I.C. Plastics, Inc.; Welding Adhesive.
D. Speedline Corporation; Speedline Vinyl Adhesive.

2.2 For indoor applications use adhesive that has a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

SCHEDULE 2 - MASTICS

PRODUCT DATA SHEET 0 - Materials shall water based and be compatible with insulation materials, jackets, and substrates; comply with MIL-PRF-19565C, Type II.

2.1 For indoor applications, use mastics that have a VOC content of 40 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

PRODUCT DATA SHEET 1 - Vapor-Barrier Mastic: Water based; suitable for indoor and outdoor use on below ambient services.

2.1 Products: Subject to compliance with requirements, provide one of the following:

A. Childers Products, Division of ITW; CP-35.
B. Design Polymerics 3040 with zero VOC's.
C. Foster Products Corporation, H. B. Fuller Company; 30-90.

2.2 Water-Vapor Permeance: ASTM E 96, Procedure B, 0.013 perm at 43-mil dry film thickness.
2.3 Service Temperature Range: Minus 20 to plus 180 deg F.
2.4 Solids Content: ASTM D 1644, 58 percent by volume and 70 percent by weight.
2.5 Color: White.

SCHEDULE 3 - SEALANTS

PRODUCT DATA SHEET 0 - Joint Sealants:

2.1 Joint Sealants for Cellular-Glass Products: Subject to compliance with requirements, provide one of the following:

A. Childers Products, Division of ITW; CP-76.
B. Foster Products Corporation, H. B. Fuller Company; 30-45.
C. Marathon Industries, Inc.; 405.

2.2 Materials shall be compatible with insulation materials, jackets, and substrates.
2.3 Permanently flexible, elastomeric sealant.
2.4 Service Temperature Range: Minus 100 to plus 300 deg F.
2.5 Color: White or gray.
2.6 For indoor applications, sealants shall have a VOC content of 420 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

PRODUCT DATA SHEET 1 - ASJ Flashing Sealants:

2.1 Products: Subject to compliance with requirements, provide one of the following:

A. Childers Products, Division of ITW; CP-76.
B. Or equal.

2.2 Materials shall be compatible with insulation materials, jackets, and substrates.
2.3 Fire- and water-resistant, flexible, elastomeric sealant.

2.4 Service Temperature Range: Minus 40 to plus 250 deg F.
2.5 Color: White.
2.6 For indoor applications and use sealants that have a VOC content of 420 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

SCHEDULE 4 - FACTORY-APPLIED JACKETS

PRODUCT DATA SHEET 0 - When factory-applied jackets are indicated, comply with the following:

2.1 ASJ: White, kraft-paper, fiberglass-reinforced scrim with aluminum-foil backing; complying with ASTM C 1136, Type I.
2.2 ASJ-SSL: ASJ with self-sealing, pressure-sensitive, acrylic-based adhesive covered by a removable protective strip; complying with ASTM C 1136, Type I.
2.3 FSK Jacket: Aluminum-foil, fiberglass-reinforced scrim with kraft-paper backing; complying with ASTM C 1136, Type II.

SCHEDULE 5 - FIELD-APPLIED JACKETS

PRODUCT DATA SHEET 0 - Field-applied jackets shall comply with ASTM C 921, Type I, unless otherwise indicated.

PRODUCT DATA SHEET 1 - PVC Jacket: High-impact-resistant, UV-resistant PVC complying with ASTM D1784, Class 16354-C; thickness as scheduled; roll stock ready for shop or field cutting and forming. Thickness is indicated in field-applied jacket schedules.

2.1 Products: Subject to compliance with requirements, provide one of the following:

A. Johns Manville; Zeston.
B. P.I.C. Plastics, Inc.; FG Series.
C. Proto Corporation; LoSmoke.
D. Speedline Corporation; SmokeSafe.

2.2 Adhesive: As recommended by jacket material manufacturer.
2.3 PVC Jacket Color:

A. Heating Hot Water Piping:

A. Heating Hot Water Supply: Dark Red
B. Heating Hot Water Return: Light Red

2.4 Factory-fabricated fitting covers to match jacket if available; otherwise, field fabricate.

A. Shapes: 45- and 90-degree, short- and long-radius elbows, tees, valves, flanges, unions, reducers, end caps, soil-pipe hubs, traps, mechanical joints, and P-trap and supply covers for lavatories.

PRODUCT DATA SHEET 2 - Moisture Barrier Jacket:

2.1 Manufacturer: Pittsburg Corning PITTWRAP or approved equal.
2.2 125 mil thick heat-seal multi-ply laminate consisting of three layers of a polymer-modified bituminous compound separated by glass reinforcement and aluminum foil.

SCHEDULE 6 - TAPES

PRODUCT DATA SHEET 0 - ASJ Tape: White vapor-retarder tape matching factory-applied jacket with acrylic adhesive, complying with ASTM C 1136.

2.1 Products: Subject to compliance with requirements, provide one of 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.

2.2 Width: 3 inches.
2.3 Thickness: 11.5 mils
2.4 Adhesion: 90 ounces force/inch in width.
2.5 Elongation: 2 percent.
2.6 Tensile Strength: 40 lbf/inch in width.
2.7 ASJ Tape Disks and Squares: Precut disks or squares of ASJ tape.

PRODUCT DATA SHEET 1 - FSK Tape: Foil-face, vapor-retarder tape matching factory-applied jacket with acrylic adhesive; complying with ASTM C 1136.

2.1 Products: Subject to compliance with requirements, provide one of the following:

A. ABI, Ideal Tape Division; 491 AWF FSK.
B. Avery Dennison Corporation, Specialty Tapes Division; Fasson 0827.
C. Compac Corporation; 110 and 111.
D. Venture Tape; 1525 CW NT, 1528 CW, and 1528 CW/SQ.

2.2 Width: 3 inches.
2.3 Thickness: 6.5 mils.
2.4 Adhesion: 90 ounces force/inch in width.
2.5 Elongation: 2 percent.
2.6 Tensile Strength: 40 lbf/inch in width.
2.7 FSK Tape Disks and Squares: Precut disks or squares of FSK tape.

PRODUCT DATA SHEET 2 - PVC Tape: White vapor-retarder tape matching field-applied PVC jacket with acrylic adhesive. Suitable for indoor and outdoor applications.

2.1 Products: Subject to compliance with requirements, provide one of the following:

A. Avery Dennison Corporation, Specialty Tapes Division; Fasson 0555.
B. Compac Corp.; 130.
C. Ideal Tape Co., Inc., an American Biltrite Company; 370 White PVC tape.
D. Venture Tape; 1506 CW NS.

2.2 Width: 2 inches.
2.3 Thickness: 6 mils.
2.4 Adhesion: 64 ounces force/inch in width.
2.5 Elongation: 500 percent.
2.6 Tensile Strength: 18 lbf/inch in width.

PRODUCT DATA SHEET 3 - Aluminum-Foil Tape: Vapor-retarder tape with acrylic adhesive.

2.1 Products: Subject to compliance with requirements, provide one of the following:

A. Avery Dennison Corporation, Specialty Tapes Division; Fasson 0800.
B. Compac Corp.; 120.
C. Ideal Tape Co., Inc., an American Biltrite Company; 488 AWF.
D. Venture Tape; 1525 CW, 1528 CW, and 1528 CW/SQ.

2.2 Width: 2 inches.
2.3 Thickness: 3.7 mils.
2.4 Adhesion: 100 ounces force/inch in width.
2.5 Elongation: 5 percent.
2.6 Tensile Strength: 34 lbf/inch in width.

SCHEDULE 7 - SECUREMENTS

PRODUCT DATA SHEET 0 - Aluminum Bands: ASTM B 209, Alloy 3003, 3005, 3105, or 5005; Temper H-14, 0.020-inch thick, 1/2 inch 3/4 inch wide with closed seal.

2.1 Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following]:

A. ITW Insulation Systems; Gerrard Strapping and Seals.
B. RPR Products, Inc.; Insul-Mate Strapping, Seals, and Springs.

PRODUCT DATA SHEET 1 - Staples: Outward-clinching insulation staples, nominal 3/4-inch wide, stainless steel or Monel.

PRODUCT DATA SHEET 2 - Wire: 0.062-inch soft-annealed, Monel.

2.1 Manufacturers: Subject to compliance with requirements, provide product by:

A. C & F Wire.
B. Childers Products.
C. PABCO Metals Corporation.
D. RPR Products, Inc.

PART 3 - EXECUTION

SCHEDULE 0 - EXAMINATION

PRODUCT DATA SHEET 0 - Examine substrates and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of insulation application.

3.1 Verify all inspection and acceptance testing of the piping as required by the specification has been completed and that the piping is ready for installation of insulation.
3.2 Verify that surfaces to be insulated are clean and dry.
3.3 Proceed with installation only after unsatisfactory conditions have been corrected.
3.4 Verify there is adequate clearance to install the pipe insulation in accordance with the operation performance parameters of the specification, such as access to controls, valves and for maintenance and repair.

SCHEDULE 1 - PREPARATION

PRODUCT DATA SHEET 0 - Surface Preparation: Clean and dry surfaces to receive insulation. Remove materials that will adversely affect insulation application.

SCHEDULE 2 - GENERAL INSTALLATION REQUIREMENTS

PRODUCT DATA SHEET 0 - Insulation shall not be installed until the following have been completed and documentation has been submitted to Owner for approval and record:

3.1 Cleaning and flushing
3.2 Pressure testing

PRODUCT DATA SHEET 1 - 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.

PRODUCT DATA SHEET 2 - Install insulation materials, forms, vapor barriers or retarders, jackets, and thicknesses required for each item of pipe system as specified in insulation system schedules.

PRODUCT DATA SHEET 3 - 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.

PRODUCT DATA SHEET 4 - Install insulation with longitudinal seams at top and bottom of horizontal runs.

PRODUCT DATA SHEET 5 - Install multiple layers of insulation with longitudinal and end seams staggered.

PRODUCT DATA SHEET 6 - Do not weld brackets, clips, or other attachment devices to piping, fittings, and specialties.

PRODUCT DATA SHEET 7 - Keep insulation materials dry during application and finishing.

PRODUCT DATA SHEET 8 - Install insulation with tight longitudinal seams and end joints. Bond seams and joints with adhesive recommended by insulation material manufacturer.

PRODUCT DATA SHEET 9 - Install insulation with least number of joints practical.

PRODUCT DATA SHEET 10 - Install rigid pre-insulated pipe supports to protect from compression of insulation material due to point loads.

PRODUCT DATA SHEET 11 - Provide aluminum sleeves at all pipe support joints, between hanger support and exterior layer of insulating systems, to protect from compression of insulation material due to point loads.

PRODUCT DATA SHEET 12 - Install insulation on piping accessories requiring future reoccuring access and service with factory fabricated insulation covers that are easily removed and reapplied.

PRODUCT DATA SHEET 13 - Where vapor barrier is indicated, seal joints, seams, and penetrations in insulation at hangers, supports, anchors, and other projections with vapor-barrier mastic.

3.1 Install insulation continuously through hangers and around anchor attachments.
3.2 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.
3.3 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.
3.4 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.

PRODUCT DATA SHEET 14 - Apply adhesives, mastics, and sealants at manufacturer's recommended coverage rate and wet and dry film thicknesses.

PRODUCT DATA SHEET 15 - Install insulation with factory-applied jackets as follows:

3.1 Draw jacket tight and smooth.
3.2 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.
3.3 Overlap jacket longitudinal seams at least 1.5 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.

3.4 Cover joints and seams with tape, according to insulation material manufacturer's written instructions, to maintain vapor seal.
3.5 Where vapor barriers are indicated, apply vapor-barrier mastic on seams and joints and at ends adjacent to pipe flanges and fittings.

PRODUCT DATA SHEET 16 - Cut insulation in a manner to avoid compressing insulation more than 75 percent of its nominal thickness.

PRODUCT DATA SHEET 17 - Finish installation with systems at operating conditions. Repair joint separations and cracking due to thermal movement.

PRODUCT DATA SHEET 18 - 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.

PRODUCT DATA SHEET 19 - For above-ambient services, do not install insulation to the following:

3.1 Vibration-control devices.
3.2 Testing agency labels and stamps.
3.3 Nameplates and data plates.
3.4 Manholes.
3.5 Handholes.
3.6 Cleanouts.

SCHEDULE 3 - PENETRATIONS

PRODUCT DATA SHEET 0 - Insulation Installation at Aboveground Exterior Wall Penetrations: Install insulation continuously through wall penetrations.

3.1 Seal penetrations with flashing sealant.
3.2 For applications requiring only indoor insulation, terminate insulation inside wall surface and seal with joint sealant. For applications requiring indoor and outdoor insulation, install insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.
3.3 Extend jacket of outdoor insulation outside wall flashing and overlap wall flashing at least 2 inches.
3.4 Seal jacket to wall flashing with flashing sealant.

PRODUCT DATA SHEET 1 - Insulation Installation at Interior Wall and Partition Penetrations: Install insulation continuously through walls and partitions.

SCHEDULE 4 - GENERAL PIPE INSULATION INSTALLATION

PRODUCT DATA SHEET 0 - Insulation Installation on Fittings, Valves, Strainers, Flanges, and Unions:

3.1 Install insulation over fittings, valves, strainers, flanges, unions, and other specialties with continuous thermal and vapor-retarder integrity unless otherwise indicated.
3.2 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.
3.3 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.
3.4 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.
3.5 Insulate strainers 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. Fill joints, seams, and irregular surfaces with insulating cement. Insulate strainers so strainer basket flange or plug can be easily removed and replaced without damaging the insulation and jacket. Provide a

removable reusable insulation cover. For below-ambient services, provide a design that maintains vapor barrier.

3.6 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.

3.7 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.

3.8 For services not specified to receive a field-applied jacket, install fitted PVC cover over elbows, tees, strainers, valves, flanges, and unions. Terminate ends with PVC end caps. Tape PVC covers to adjoining insulation facing using PVC tape.

3.9 Label the outside insulation jacket of each union with the word "union." Match size and color of pipe labels.

PRODUCT DATA SHEET 1 - Insulate instrument connections for thermometers, pressure gages, pressure temperature taps, test connections, flow meters, sensors, switches, and transmitters on insulated pipes. Shape insulation at these connections by tapering it to and around the connection with insulating cement and finish with finishing cement, mastic, and flashing sealant.

PRODUCT DATA SHEET 2 - Install removable insulation covers at locations indicated. Installation shall conform to the following:

3.1 Make removable flange and union insulation from sectional pipe insulation of same thickness as that on adjoining pipe. Install same insulation jacket as adjoining pipe insulation.

3.2 When flange and union covers are made from sectional pipe insulation, extend insulation from flanges or union long at least two times the insulation thickness over adjacent pipe insulation on each side of flange or union. Secure flange cover in place with stainless-steel or aluminum bands. Select band material compatible with insulation and jacket.

3.3 Construct removable valve insulation covers in same manner as for flanges, except divide the two-part section on the vertical center line of valve body.

3.4 When covers are made from block insulation, make two halves, each consisting of mitered blocks wired to stainless-steel fabric. Secure this wire frame, with its attached insulation, to flanges with tie wire. Extend insulation at least 2 inches over adjacent pipe insulation on each side of valve. Fill space between flange or union cover and pipe insulation with insulating cement. Finish cover assembly with insulating cement applied in two coats. After first coat is dry, apply and trowel second coat to a smooth finish.

3.5 Unless a PVC jacket is indicated in field-applied jacket schedules, finish exposed surfaces with a metal jacket.

SCHEDULE 5 - INSTALLATION OF PHENOLIC INSULATION

PRODUCT DATA SHEET 0 - General Installation Requirements:

3.1 Secure single-layer insulation with stainless-steel bands at 12-inch intervals and tighten bands without deforming insulation materials.

3.2 Install 2-layer insulation with joints tightly butted and staggered at least 3 inches. Secure inner layer with 0.062-inchwire spaced at 12-inchintervals. Secure outer layer with stainless-steel bands at 12-inchintervals.

PRODUCT DATA SHEET 1 - Insulation Installation on Straight Pipes and Tubes:

3.1 Secure each layer of insulation to pipe with wire or bands and tighten bands without deforming insulation materials.
3.2 Where vapor barriers are indicated, seal longitudinal seams, end joints, and protrusions with vapor-barrier mastic and joint sealant.
3.3 For insulation with factory-applied jackets on above-ambient services, secure laps with outward-clinched staples at 6 incheso.c.
3.4 For insulation with factory-applied jackets with vapor retarders on below-ambient services, 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.

PRODUCT DATA SHEET 2 - Insulation Installation on Pipe Flanges:

3.1 Install preformed pipe insulation to outer diameter of pipe flange.
3.2 Make width of insulation section same as overall width of flange and bolts, plus twice the thickness of pipe insulation.
3.3 Fill voids between inner circumference of flange insulation and outer circumference of adjacent straight pipe segments with cut sections of block insulation of same material and thickness as pipe insulation.

PRODUCT DATA SHEET 3 - Insulation Installation on Pipe Fittings and Elbows:

3.1 Install preformed insulation sections of same material as straight segments of pipe insulation. Secure according to manufacturer's written instructions.

PRODUCT DATA SHEET 4 - Insulation Installation on Valves and Pipe Specialties:

3.1 Install preformed insulation sections of same material as straight segments of pipe insulation. Secure according to manufacturer's written instructions.
3.2 Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.
3.3 Install insulation to flanges as specified for flange insulation application.

SCHEDULE 6 - FIELD-APPLIED JACKET INSTALLATION

PRODUCT DATA SHEET 0 - Where FSK jackets are indicated, install as follows:

3.1 Draw jacket material smooth and tight.
3.2 Install lap or joint strips with same material as jacket.
3.3 Secure jacket to insulation with manufacturer's recommended adhesive.
3.4 Install jacket with 1.5-inch laps at longitudinal seams and 3-inch wide joint strips at end joints.
3.5 Seal openings, punctures, and breaks in vapor-retarder jackets and exposed insulation with vapor-barrier mastic.

PRODUCT DATA SHEET 1 - Where PVC jackets are indicated, install as follows:

3.1 With 1-inch overlap at longitudinal seams and end joints; for horizontal applications.
3.2 Seal with manufacturer's recommended adhesive.
3.3 Apply two continuous beads of adhesive to seams and joints, one bead under lap and the finish bead along seam and joint edge.

PRODUCT DATA SHEET 2 - Where metal jackets are indicated, install as follows:

3.1 With 2-inch overlap at longitudinal seams and end joints.
3.2 Overlap longitudinal seams arranged to shed water.
3.3 Seal end joints with weatherproof sealant recommended by insulation manufacturer.
3.4 Secure jacket with stainless-steel bands 12 inches o.c. and at end joints.

SCHEDULE 7 - FIELD QUALITY CONTROL

PRODUCT DATA SHEET 0 - Perform tests and inspections.

PRODUCT DATA SHEET 1 - All insulation applications will be considered defective Work if sample inspection reveals noncompliance with requirements.

SCHEDULE 8 - PIPING INSULATION SCHEDULE, GENERAL

PRODUCT DATA SHEET 0 - Acceptable preformed pipe and tubular insulation materials and thicknesses are identified for each piping system and pipe size range.

SCHEDULE 9 - ABOVEGROUND PIPING INSULATION SCHEDULE

PRODUCT DATA SHEET 0 - Heating Hot Water Supply and Return, 200°F and below:

3.1 NPS 1.25 inch and smaller: Phenolic, pre-formed pipe insulation, 1.5 inches thick.
3.2 NPS 1.5 inch and larger: Phenolic, pre-formed pipe insulation, 2 inches thick.

SCHEDULE 10 - INDOOR, FIELD-APPLIED JACKET SCHEDULE

PRODUCT DATA SHEET 0 - Install jacket over insulation material. For insulation with factory-applied jacket, install the field-applied jacket over the factory-applied jacket.

PRODUCT DATA SHEET 1 - Piping, Concealed: None.

PRODUCT DATA SHEET 2 - Piping, Exposed: PVC, Color-Coded by system, 30 mils thick for all indoor applications.

SCHEDULE 11 - OUTDOOR, FIELD-APPLIED JACKET SCHEDULE

PRODUCT DATA SHEET 0 - Install jacket over insulation material. For insulation with factory-applied jacket, install the field-applied jacket over the factory-applied jacket.

PRODUCT DATA SHEET 1 - Piping, Concealed: None.

END OF SECTION 23 07 19

SECTION 23 21 13 HYDRONIC PIPING

PART 1 - GENERAL

SCHEDULE 12 - RELATED DOCUMENTS

PRODUCT DATA SHEET 0 - Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

SCHEDULE 13 - SUMMARY

PRODUCT DATA SHEET 0 - Section includes pipe and fitting materials and joining methods for the following:

3.1 Copper tube and fittings.
3.2 Joining materials.
3.3 Transition fittings.
3.4 Dielectric fittings.

SCHEDULE 14 - SUBMITTALS

PRODUCT DATA SHEET 0 - Format submittals per Section 23 00 00 “General Mechanical Requirements.”

PRODUCT DATA SHEET 1 - The Contractor, manufacturer, or vendor shall resubmit this specification section showing compliance with each respective paragraph and specified items in this section. All exceptions shall be clearly identified by referencing the respective paragraph and other requirements. Next to each specification item, indicate the following:

3.1 “No Exceptions Taken.”
3.2 “Exception.” All exceptions shall be clearly identified by referencing respective paragraph and other requirements along with the proposed alternative.

PRODUCT DATA SHEET 2 - Product Data: For each type of the following:

3.1 Piping, tubing and fittings data. Submit data indicating that pipe, tube and fittings are manufactured exclusively in the United States.
3.2 Fittings.
3.3 Joining materials.
3.4 Welding procedures.
3.5 Coating data. Include product information and coating procedures.

SCHEDULE 15 - INFORMATIONAL SUBMITTALS

PRODUCT DATA SHEET 0 - Qualification Data: For Installer.

PRODUCT DATA SHEET 1 - Welding certificates.

PRODUCT DATA SHEET 2 - Field quality-control reports.

SCHEDULE 16 - QUALITY ASSURANCE

PRODUCT DATA SHEET 0 - Installer Qualifications:

PRODUCT DATA SHEET 1 - Pipe Welding: Qualify procedures and operators according to ASME Boiler and Pressure Vessel Code: Section IX.

3.1 Comply with ASME B31.9, "Building Services Piping," for materials, products, and installation.
3.2 Certify that each welder has passed AWS qualification tests for welding processes involved and that certification is current.

SCHEDULE 17 - COORDINATION

PRODUCT DATA SHEET 0 - Coordinate layout and installation of hydronic piping and suspension system components with other construction, including light fixtures, HVAC equipment, fire-suppression-system components, and partition assemblies.

PRODUCT DATA SHEET 1 - Coordinate pipe fitting pressure classes with products specified in related Sections.

PART 2 - PRODUCTS

SCHEDULE 18 - PERFORMANCE REQUIREMENTS

PRODUCT DATA SHEET 0 - Hydronic piping components and installation shall be capable of withstanding the following minimum working pressure and temperature unless otherwise indicated:

3.1 Hot-Water Heating Piping: 150 psig at 200 deg F.

SCHEDULE 19 - COPPER TUBE AND FITTINGS

PRODUCT DATA SHEET 0 - Drawn-Temper Copper Tubing: ASTM B 88, Type L, ASTM B 88 Type K.

PRODUCT DATA SHEET 1 - Wrought-Copper Fittings: ASME B16.22.

3.1 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. Anvil International, Inc.
B. S. P. Fittings; a division of Star Pipe Products.

SCHEDULE 20 - JOINING MATERIALS

PRODUCT DATA SHEET 0 - Pipe-Flange Gasket Materials: Suitable for chemical and thermal conditions of piping system contents.

3.1 ASME B16.21, nonmetallic, flat, asbestos free, 1/8-inch maximum thickness unless otherwise indicated.

A. Full-Face Type: For flat-face, Class 125, cast-iron and cast-bronze flanges.
B. Narrow-Face Type: For raised-face, Class 250, cast-iron and steel flanges.

PRODUCT DATA SHEET 1 - Flange Bolts and Nuts: ASME B18.2.1, carbon steel if unexposed, 316 stainless steel if flange is exposed.

PRODUCT DATA SHEET 2 - Solder Filler Metals: ASTM B 32, lead-free alloys. Include water-flushable flux according to ASTM B 813.

PRODUCT DATA SHEET 3 - Brazing Filler Metals: AWS A5.8/A5.8M, BCuP Series, copper-phosphorus alloys for joining copper with copper; or BAg-1, silver alloy for joining copper with bronze or steel.

PRODUCT DATA SHEET 4 - Welding Filler Metals: Comply with AWS D10.12M/D10.12 for welding materials appropriate for wall thickness and chemical analysis of steel pipe being welded.

SCHEDULE 21 - DIELECTRIC FITTINGS

PRODUCT DATA SHEET 0 - General Requirements: Assembly of copper alloy and ferrous materials with separating nonconductive insulating material. Include end connections compatible with pipes to be joined.

PRODUCT DATA SHEET 1 - Dielectric Unions:

3.1 Manufacturers: Subject to compliance with requirements, provide products by one of the following:

A. Capitol Manufacturing Company.
B. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
C. Wilkins; a Zurn company.

3.2 Description:

A. Standard: ASSE 1079.
B. Pressure Rating: 125 psig minimum at 180 deg F
C. End Connections: Solder-joint copper alloy and threaded ferrous.

PRODUCT DATA SHEET 2 - Dielectric Flanges:

3.1 Manufacturers: Subject to compliance with requirements, provide products by one of the following:

A. Capitol Manufacturing Company.
B. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
C. Wilkins; a Zurn company.

3.2 Description:

A. Standard: ASSE 1079.
B. Factory-fabricated, bolted, companion-flange assembly.
C. Pressure Rating: 175 psig.
D. End Connections: Solder-joint copper alloy and threaded ferrous; threaded solder-joint copper alloy and threaded ferrous.

PRODUCT DATA SHEET 3 - Dielectric-Flange Insulating Kits:

3.1 Manufacturers: Subject to compliance with requirements, provide products by one of the following:

A. Advance Products & Systems, Inc.
B. Calpico, Inc.
C. Central Plastics Company
D. Pipeline Seal and Insulator, Inc.

3.2 Description:

A. Nonconducting materials for field assembly of companion flanges.
B. Pressure Rating: 150 psig
C. Gasket: Neoprene or phenolic.
D. Bolt Sleeves: Phenolic or polyethylene.
E. Washers: Phenolic with steel backing washers.

PRODUCT DATA SHEET 4 - Dielectric Nipples:

3.1 Manufacturers: Subject to compliance with requirements, provide products by one of the following:

A. Elster Perfection
B. Grinnell Mechanical Products
C. Matco-Norca, Inc.
D. Precision Plumbing Products, Inc.
E. Victaulic Company

3.2 Description:

A. Standard: IAPMO PS 66.
B. Electroplated steel nipple, complying with ASTM F 1545.
C. Pressure Rating: 300 psig at 225 deg F.
D. End Connections: Male threaded or grooved.
E. Lining: Inert and noncorrosive, propylene.

PART 2 - EXECUTION

SCHEDULE 22 - PIPING APPLICATIONS

PRODUCT DATA SHEET 0 - Hot-water heating piping, aboveground, NPS 2-1/2 and smaller, shall be the following:

3.1 Type L drawn-temper copper tubing, with 95-5 soldered wrought-copper fittings.
3.2 Insulated per Section 23 07 19 HVAC Piping Insulation.

SCHEDULE 23 - PIPING INSTALLATIONS

PRODUCT DATA SHEET 0 - Drawing schematics and diagrams indicate general location and arrangement of piping systems. Install piping as indicated unless deviations to layout are approved on Shop Drawings.

PRODUCT DATA SHEET 1 - Install piping in concealed locations unless otherwise indicated and except in equipment rooms and service areas.

PRODUCT DATA SHEET 2 - 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.

PRODUCT DATA SHEET 3 - Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.

PRODUCT DATA SHEET 4 - Install piping to permit valve servicing.

PRODUCT DATA SHEET 5 - Install piping at indicated slopes.

PRODUCT DATA SHEET 6 - Install piping free of sags and bends.

PRODUCT DATA SHEET 7 - Install fittings for changes in direction and branch connections.

PRODUCT DATA SHEET 8 - Install piping to allow application of insulation.

PRODUCT DATA SHEET 9 - Select system components with pressure rating equal to or greater than system operating pressure.

PRODUCT DATA SHEET 10 - Install groups of pipes parallel to each other, spaced to permit applying insulation and servicing of valves.

PRODUCT DATA SHEET 11 - Install piping at a uniform grade of 0.2 percent upward in direction of flow.

PRODUCT DATA SHEET 12 - Reduce pipe sizes using eccentric reducer fitting installed with level side up.

PRODUCT DATA SHEET 13 - Install branch connections to mains using mechanically formed tee fittings or integrally reinforced forged branch outlet fittings in main pipe, with the branch connected to the bottom of the main pipe. For up-feed risers, connect the branch to the top of the main pipe.

PRODUCT DATA SHEET 14 - Install unions in piping, NPS 2 and smaller, adjacent to valves, at final connections of equipment, and elsewhere as indicated.

PRODUCT DATA SHEET 15 - Install shutoff valve immediately upstream of each dielectric fitting.

SCHEDULE 24 - DIELECTRIC FITTING INSTALLATION

PRODUCT DATA SHEET 0 - Install dielectric fittings in piping at connections of dissimilar metal piping and tubing.

PRODUCT DATA SHEET 1 - Dielectric Fittings for NPS 2and Smaller: Use dielectric unions.

PRODUCT DATA SHEET 2 - Dielectric Fittings for NPS 2-1/2 and Larger: Use dielectric flange kits.

SCHEDULE 25 - HANGERS AND SUPPORTS

PRODUCT DATA SHEET 0 - Comply with requirements in Section 23 05 29 "Hangers and Supports for HVAC Piping and Equipment" for hanger, support, and anchor devices. Comply with the following requirements for maximum spacing of supports.

PRODUCT DATA SHEET 1 - Comply with requirements in Section 23 05 48 "Vibration and Seismic Controls for HVAC" for seismic restraints.

PRODUCT DATA SHEET 2 - Install the following pipe attachments:

3.1 Adjustable steel clevis hangers for individual horizontal piping less than 20 feet long
3.2 Adjustable roller hangers and spring hangers for individual horizontal piping 20 feet or longer.
3.3 Pipe Roller: MSS SP-58, Type 44 for multiple horizontal piping 20 feet or longer, supported on a trapeze.
3.4 Spring hangers to support vertical runs.
3.5 Provide copper-clad hangers and supports for hangers and supports in direct contact with copper pipe.
3.6 On plastic pipe, install pads or cushions on bearing surfaces to prevent hanger from scratching pipe.

PRODUCT DATA SHEET 3 - Install hangers for steel piping with the following maximum spacing and minimum rod sizes:

3.1 NPS 3/4: Maximum span, 7 feet.
3.2 NPS 1: Maximum span, 7 feet.
3.3 NPS 1-1/2: Maximum span, 9 feet.
3.4 NPS 2: Maximum span, 10 feet.
3.5 NPS 2-1/2: Maximum span, 11 feet.
3.6 NPS 3 and Larger: Maximum span, 12 feet.

PRODUCT DATA SHEET 4 - Install hangers for drawn-temper copper piping with the following maximum spacing and minimum rod sizes:

3.1 NPS 3/4: Maximum span, 5 feet; minimum rod size, 1/4 inch.
3.2 NPS 1: Maximum span, 6 feet; minimum rod size, 1/4 inch.
3.3 NPS 1-1/4Maximum span, 7 feet; minimum rod size, 3/8 inch.
3.4 NPS 1-1/2: Maximum span, 8 feet; minimum rod size, 3/8 inch.
3.5 NPS 2: Maximum span, 8 feet; minimum rod size, 3/8 inch.
3.6 NPS 2-1/2: Maximum span, 9 feet; minimum rod size, 3/8 inch.
3.7 NPS 3 and Larger: Maximum span, 10 feet; minimum rod size, 3/8 inch.

SCHEDULE 26 - PIPE JOINT CONSTRUCTION

PRODUCT DATA SHEET 0 - Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.

PRODUCT DATA SHEET 1 - Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.

PRODUCT DATA SHEET 2 - Soldered Joints: Apply ASTM B 813, water-flushable flux, unless otherwise indicated, to tube end. Construct joints according to ASTM B 828 or CDA's "Copper Tube Handbook," using lead-free solder alloy complying with ASTM B 32.

PRODUCT DATA SHEET 3 - 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:

3.1 Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.
3.2 Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.

PRODUCT DATA SHEET 4 - Flanged Joints: Select appropriate gasket material, size, type, and thickness for service application. Install gasket concentrically positioned. Use suitable lubricants on bolt threads.

SCHEDULE 27 - TERMINAL EQUIPMENT CONNECTIONS

PRODUCT DATA SHEET 0 - Sizes for supply and return piping connections shall be the same as or larger than equipment connections.

PRODUCT DATA SHEET 1 - Install control valves in accessible locations close to connected equipment.

PRODUCT DATA SHEET 2 - Install ports for pressure gages and thermometers at coil inlet and outlet connections. Comply with requirements in Section 23 05 19 "Meters and Gages for HVAC Piping."

SCHEDULE 28 - FIELD QUALITY CONTROL

PRODUCT DATA SHEET 0 - Prepare hydronic piping according to ASME B31.9 and as follows:

3.1 Leave joints, including welds, uninsulated and exposed for examination during test.
3.2 Inspect finish of exposed, hydronic piping, including outlets, valves, specialties, and devices, after installation is complete. Remove burrs, dirt, and debris. Repair damaged finishes including chips, scratches, and abrasions.
3.3 Provide temporary restraints for expansion joints that cannot sustain reactions due to test pressure. If temporary restraints are impractical, isolate expansion joints from testing.
3.4 Flush hydronic piping systems with minimum 5 ft/s velocity clean water; then remove and clean or replace strainer screens. Promptly passivate and chemically treat piping systems after flush per requirements in Section 23 25 13 “Water Treatment for Closed-Loop Hydronic Systems.”
3.5 Isolate equipment from piping. If a valve is used to isolate equipment, its closure shall be capable of sealing against test pressure without damage to valve. Install blinds in flanged joints to isolate equipment.
3.6 Install safety valve, set at a pressure no more than one-third higher than test pressure, to protect against damage by expanding liquid or other source of overpressure during test.

PRODUCT DATA SHEET 1 - Perform the following tests on hydronic piping:

3.1 Use ambient temperature water as a testing medium unless there is risk of damage due to freezing. Another liquid that is safe for workers and compatible with piping may be used.
3.2 While filling system, use vents installed at high points of system to release air. Use drains installed at low points for complete draining of test liquid.
3.3 Isolate expansion tanks and determine that hydronic system is full of water.
3.4 Subject piping system to hydrostatic test pressure that is not less than 1.5 times the system's working pressure. Test pressure shall not exceed maximum pressure for any vessel, pump, valve, or other component in system under test. Verify that stress due to pressure at bottom of vertical runs does not exceed 90 percent of specified minimum yield strength or 1.7 times the "SE" value in Appendix A in ASME B31.9, "Building Services Piping."
3.5 After hydrostatic test pressure has been applied for at least 10 minutes, examine piping, joints, and connections for leakage. Eliminate leaks by tightening, repairing, or replacing components, and repeat hydrostatic test until there are no leaks.
3.6 Prepare written report of testing.

PRODUCT DATA SHEET 2 - Perform the following before operating the system:

3.1 Open manual valves fully.
3.2 Inspect pumps for proper rotation.
3.3 Set makeup pressure-reducing valves for required system pressure.
3.4 Inspect air vents at high points of system and determine if all are installed and operating freely (automatic type), or bleed air completely (manual type).
3.5 Set temperature controls so all coils are calling for full flow.
3.6 Inspect and set operating temperatures of hydronic equipment, such as boilers, chillers, cooling towers, to specified values.
3.7 Verify lubrication of motors and bearings.

SCHEDULE 29 - CLEANING AND PROTECTION

PRODUCT DATA SHEET 0 - Remove all packaging, unused fasteners, and other installation materials from the project site.

PRODUCT DATA SHEET 1 - Provide protection as required to leave the work in undamaged condition at the time of completion.

END OF SECTION 23 21 13

SECTION 23 21 16

HYDRONIC PIPING SPECIALTIES

PART 4 - GENERAL

SCHEDULE 0 - RELATED DOCUMENTS

PRODUCT DATA SHEET 0 - Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

SCHEDULE 1 - SUMMARY

PRODUCT DATA SHEET 0 - Section includes:

4.1 Coil piping packages.

SCHEDULE 2 - SUBMITTALS

PRODUCT DATA SHEET 0 - Submittals shall be formatted per Section 230000 “General Mechanical Requirements”.

PRODUCT DATA SHEET 1 - The Contractor, manufacturer, or vendor shall resubmit this specification section showing compliance with each respective paragraph and specified items in this section. All exceptions shall be clearly identified by referencing the respective paragraph and other requirements. Next to each specification item, indicate the following:

4.1 “No Exceptions Taken.”
4.2 “Exception.” All exceptions shall be clearly identified by referencing respective paragraph and other requirements along with the proposed alternative.

PRODUCT DATA SHEET 2 - Product Data: For each type of product:

4.1 Include construction details and material descriptions for hydronic piping specialties.
4.2 Include rated capacities, operating characteristics, and furnished specialties and accessories.
4.3 Include flow and pressure drop curves based on manufacturer's testing for calibrated-orifice balancing valves and automatic flow-control valves.

SCHEDULE 3 - CLOSEOUT SUBMITTALS

PRODUCT DATA SHEET 0 - Operation and Maintenance Data: For air-control devices, hydronic specialties, and special-duty valves to include in emergency, operation, and maintenance manuals.

SCHEDULE 4 - MAINTENANCE MATERIAL SUBMITTALS

PRODUCT DATA SHEET 0 - Differential Pressure Meter: For each type of balancing valve and automatic flow control valve, include flowmeter, probes, hoses, flow charts, and carrying case.

SCHEDULE 5 - QUALITY ASSURANCE

PRODUCT DATA SHEET 0 - Pipe Welding: Qualify procedures and operators according to ASME Boiler and Pressure Vessel Code: Section IX.

PRODUCT DATA SHEET 1 - Safety valves and pressure vessels shall bear the appropriate ASME label. Fabricate and stamp air separators and expansion tanks to comply with ASME Boiler and Pressure Vessel Code: Section VIII, Division 1.

PART 5 - PRODUCTS

SCHEDULE 0 - COIL PIPING PACKAGE

PRODUCT DATA SHEET 0 - Manufacturers: Subject to compliance with requirements, provide products by one of the following:

5.1 NuTech Hydronic Specialty Products.
5.2 Flow Design Inc.
5.3 Griswold Controls.

PRODUCT DATA SHEET 1 - Coil Piping Package – 1/2" to 2”:

5.1 Supply Side:

A. Manual air vent with pressure/temperature port.

A. Brass body, EPDM core and O-ring, knurled handle and cap.
B. Side vent with 1/8" hose barb and 1/4" NPT.
C. Extended length.
D. Minimum rating of 250 PSIG at 250°F.

B. Combination Y-strainer with integral pressure/temperature port.

A. Forged or cast brass body. EPDM O-ring. Plated steel handle with vinyl grip. Blow out-proof stem. Chrome plated ball with Teflon seats.
B. Strainer with 20 mesh stainless steel screen with removable cap. Strainer shall be fitted with a hose end blow down valve with cap and chain.
C. Minimum rating of 400 PSIG at 250°F.

C. The isolation ball valve with extended handle shall be independent from piping package.

5.2 Return Side:

A. Union with pressure/temperature port and manual air vent.

A. Brass O-ring type union. EPDM O-ring. Knurled handle and cap. Blowout-proof stem. Side vent with 1/8" hose barb. 1/4" and 1/2" NPT. Extended length.
B. Minimum Ratings 400 PSIG at 250°F.

B. Integral union with pressure/temperature port.

A. Forged or cast brass body. EPDM O-ring. Plated steel handle with vinyl grip. Blow out-proof stem. Chrome plated ball with Teflon seats.
B. Minimum rating of 400 PSIG at 250°F.

C. The isolation ball valve with extended handle shall be independent from piping package.
D. No manual or automatic balancing valves required on main pipe.

PRODUCT DATA SHEET 2 - Automatic Balancing Valves:

5.1 Provide automatic balancing valves at pot feeder to maintain minimum flow.
5.2 Flowrate shall be factory set and shall valve shall automatically limit the rate of flow to within ±5% of the specified GPM over at least 95% of the control range.
5.3 For 3/4" valve, the flow cartridge shall be removable from the Y-body housing without the use of special tools to provide access for cartridge change-out, inspection and cleaning without breaking the main piping.
5.4 Valve pressure loss shall not exceed seven feet.
5.5 Valve shall have 2 pressure and temperature ports.
5.6 The valve handle shall be fitted with a fine tuning memory stop handle to allow for adjusting the control range.
5.7 The differential pressure across the automatic balancing valve shall be measured for flow verification and to determine the amount of system over heading or under pumping.
5.8 Provide pressure and temperature test kit with the ability to read differential pressure from 0 to 75 PSIG, and temperature from -10 to 230°F.

PART 6 - EXECUTION

SCHEDULE 0 - VALVE APPLICATIONS

PRODUCT DATA SHEET 0 - Install shutoff-duty valves at each branch connection to supply mains and at supply connection to each piece of equipment.

PRODUCT DATA SHEET 1 - Install calibrated-orifice, balancing valves in the return pipe of each heating or cooling terminal.

SCHEDULE 1 - HYDRONIC SPECIALTIES INSTALLATION

PRODUCT DATA SHEET 0 - Install manual air vents at high points in piping, at heat-transfer coils, and elsewhere as required for system air venting.

SCHEDULE 2 - TERMINAL EQUIPMENT CONNECTIONS

PRODUCT DATA SHEET 0 - Sizes for supply and return piping connections shall be per drawings.

PRODUCT DATA SHEET 1 - Install control valves in accessible locations close to connected equipment.

END OF SECTION 23 21 16