TABLE OF CONTENTS

PART VI - SPECIFICATIONS

TABLE OF CONTENTS

TABLE OF CONTENTS

TABLE OF CONTENTS

PART 1 GENERAL SECTION 01 23 00 - SUMMARY OF WORK

1.1 PROJECT

A. Abbreviated Written Summary: Briefly and without force and effect upon the Contract Documents, the Work of the Contract ca be summarized as follows:
   1. The Project consists of the construction of Jane Hahn ADA improvements in accordance with all Plans, Specifications and Bid Documents, herein referred to as Project. The Project is located at 306 N Villa Ave, Willows CA and the Work of the Contract can be summarized as follows: ADA Improvements: Interior demolition of limited existing conditions, improvement of existing public counter, ADA signage at entry, remodel of existing restrooms and office space. The existing mechanical, plumbing and electrical are to be modified as needed to accommodate new layout.
   2. The Project is located in Willows, California, as shown on Documents prepared by Calpo Hom & Dong Architects.

1.2 GLENN COUNTY OCCUPANCY

A. Glenn County intends to occupy the Project 60 Days from the Notice to Proceed.
B. The Contractor shall schedule the Work to accommodate Glenn County occupancy.

1.3 CONTRACTOR USE OF SITE

A. Construction Operations: Limited to boundary of Work and private property (if private property the Contractor shall obtain written permission from the private property owner to use such site and provide the County with a copy of the agreement with the private property owner), exclusive of designated wetland area.
B. Provide access to and from site as required by law and by County:
   1. Emergency Building Exits During Construction: Keep all exits required by the 2019 California Building Code open during construction period; provide temporary exit signs if exit routes are temporarily altered.
   2. Do not obstruct roadways, sidewalks, or other public ways without permit from County.
C. Time Restrictions:
   1. Limit conduct of construction noise, malodorous, and dusty exterior Work to the hours of 7:00 a.m. to 7:00 p.m. daily, unless otherwise authorized by Engineer.
   2. Limit conduct of loading and unloading activities to the hours of 7:00 a.m. to 10:00 p.m., Monday through Friday, unless otherwise authorized by Engineer.
D. Utility Outages and Shutdown:
   1. Do not disrupt or shut down life safety systems, including but not limited to fire sprinklers and fire alarm system, without 14 calendar day notice and approval by County and authorities having jurisdiction.
   2. Prevent accidental disruption of utility services to other facilities.
E. Nonsmoking Building: Smoking is not permitted on the Project's site.

F. Controlled Substances: Use of tobacco products and other controlled substances on the Project's site is not permitted.

1.4 SPECIFICATION AND DRAWING CONVENTIONS

A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
   1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
   2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.

B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.

C. Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in the Technical Specifications. One or more of the following are
   1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
   2. Abbreviations: Materials and products are identified by abbreviations published as part of the U.S. National CAD Standard and scheduled on Drawings.
   3. Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Specification.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED
END OF SECTION

END OF SECTION

SECTION 01 23 00 - ALTERNATES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SECTION INCLUDES

A. Submission procedures.

B. Documentation of changes to Contract Price and Contract Time.

1.3 RELATED SECTIONS

A. Division 0 Sections

B. Section 01 25 13 - Product Substitution Procedures.

C. Section 01 33 00 – Submittal Procedures: Work schedule affected by Alternates.

1.4 DESCRIPTION

A. The items of work indicated below propose modifications to, substitutions for, additions to and/or deletions from the various parts of the Work specified in other Sections of the Specifications. The acceptance or rejection of any of the alternates is strictly at the option of the County subject to County's acceptance of Contractor's stated prices contained in this Proposal.

1.5 REQUIREMENTS

A. Submit Alternates with full description of the proposed Alternate and the effect on adjacent or related components.

B. Alternates quoted on Bid Forms will be reviewed and accepted or rejected at County's option. Accepted Alternates will be identified in the County-Contractor Agreement.

C. Coordinate related work and modify surrounding work to integrate the Work of each Alternate.

D. Where an item is omitted, or scope of Work is decreased, all Work pertaining to the item whether specifically stated or not, shall be omitted and where an item is added or modified or where scope of Work is increased, all Work pertaining to that required

to render same ready for use on the Project in accordance with the intention of the Drawings and Specifications shall be included in an agreed upon price amount.

1.6 SELECTION AND AWARD OF ALTERNATES

A. Indicate variation of Bid Price for Alternates described below and list in Bid Form Document or any supplement to it, which requests a 'difference' in Bid Price by adding to or deducting from the base bid price.

B. Bid will be evaluated on base bid price. After determination of preferred bidder, consideration will be given to Alternates and Bid Price adjustments.

1.7 SCHEDULE OF ALTERNATES

A. Alternates:

NONE

PART 2 - ADDITIVE ALTERNATE 1: PRODUCTS – NOT USED

PART 3 - EXECUTION – NOT USED

END OF SECTION 01 23 00

SECTION 01 25 00 - SUBSTITUTION PROCEDURES

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specifications Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for substitutions.

1.3 RELATED SECTIONS

A. Section 01 60 00 - Product Requirements, for submittal procedures and Contract document revisions initiated by Contractor.

1.4 DEFINITIONS

A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.
   1. Substitutions for Convenience: Changes proposed by Contractor or County that are not required in order to meet other Project requirements but may offer advantage to Contractor or County.
      a. Substitutions for Convenience shall include any comparable ("or equivalent") product, including proposed changes to named products, proposed changes to listed manufacturers and proposed changes to basis-of-design products, unless a Substitution for Cause regarding the comparable products are proposed in which case the Contractor shall provide information of the cause.
   2. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.

1.5 SUBMITTALS

A. Substitution Requests: Submit complete request by PDF or three hard copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
   1. Substitution Request Form: Appropriate form as approved by Owner.
   2. Documentation: Submit the information indicated below to provide the Owner with the minimum information necessary to fairly review and evaluate the proposed substitutions, proposed comparable products and proposed changes to specified products. Show compliance with requirements and the following, as applicable:
      a. Statement indicating why specified product or fabrication or installation cannot be provided, if applicable.
      b. Coordination information which shall be necessary to accommodate proposed substitution, including a list of changes or modifications needed to other parts of the Work and to construction performed by County and separate Contractors.
      c. Detailed side by side comparison of significant qualities of proposed substitution with those of the Work specified. Include annotated copy of applicable

specification section. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.

d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
e. Samples and mock-ups, where applicable or requested.
f. Certificates and qualification data, where applicable or requested.
g. List of similar installations for completed projects with project's names and addresses and names and addresses of Architects and Owners.
h. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
i. Research reports evidencing compliance with California Building Code in effect for Project, from ICC-ES or other recognized code organizations acceptable to authorities having jurisdiction.
j. Detailed comparison of Contractor's construction schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
k. Cost information, including a proposal of change, if any, in the Contract Sum.
l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.
m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.

3. Owner's Action: If necessary, Owner will request additional information or documentation for evaluation within seven days of receipt of a request for substitution. Owner will notify Contractor of acceptance or rejection of proposed substitution within fourteen calendar days of receipt of request, or within fourteen calendar days of receipt of additional information or documentation, whichever is later.
   a. Forms of Acceptance: Change Order or Construction Change Directive. Owner's Supplemental Instructions may be used for minor changes in the Work.
   b. Use product specified if Owner does not issue a decision on use of a proposed substitution within time allocated.

1.6 QUALITY ASSURANCE

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

1.7 PROCEDURES

A. Coordination: Modify or adjust affected Work as necessary to integrate Work of the approved substitutions.

PART 2 – PRODUCTS

2.1 SUBSTITUTIONS

A. Substitutions for Convenience: Per General Conditions, Section C - Control of Work; and the following:
   1. Conditions: If the following conditions are not satisfied, Owner will return requests as Rejected, noting noncompliance with these requirements:
      a. Requested substitution offers County a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities County must assume. County's additional responsibilities may include compensation to others for redesign and evaluation services, increased cost of other construction by County, and similar considerations.
      b. Requested substitution does not require extensive revisions to the Contract Documents.
      c. Requested substitution is consistent with the Contract Documents and will produce indicated results.
      d. Requested substitution provides sustainable design characteristics that specified product provided.
      e. Substitution request is fully documented and properly submitted.
      f. Requested substitution shall not adversely affect Contractor's construction schedule.
      g. Requested substitution has received necessary approvals of authorities having jurisdiction.
      h. Requested substitution is compatible with other portions of the Work.
      i. Requested substitution has been coordinated with other portions of the Work.
      j. Requested substitution provides specified warranty.
      k. If requested substitution involves more than one Contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

B. Substitutions for Cause: Submit requests for substitution immediately upon discovery of need for change, but not later than 14 days prior to time required for preparation and review of related submittals.
   1. Conditions: Owner will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Owner will return requests without action, except to record noncompliance with these requirements:
      a. Describe the non-convenience cause that is triggering the request for the change.
      b. Requested substitution is consistent with the Contract Documents and will produce indicated results.
      c. Requested substitution provides sustainable design characteristics that specified product provided.
      d. Substitution request is fully documented and properly submitted.
      e. Requested substitution will not adversely affect Contractor's construction schedule.

f. Requested substitution has received necessary approvals of authorities having jurisdiction.
g. Requested substitution is compatible with other portions of the Work.
h. Requested substitution has been coordinated with other portions of the Work.
i. Requested substitution provides specified warranty.
j. If requested substitution involves more than one Contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 26 00 - CONTRACT MODIFICATION PROCEDURES

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for handling and processing Contract modifications.
B. Related Requirements:
   1. Division 01 25 00 Section "Substitution Procedures" for administrative procedures for handling requests for substitutions made after Contract award.

1.3 MINOR CHANGES IN THE WORK

A. Owner may issue supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on the following form:
   1. AIA Document G710, "Supplemental Instructions" or similar form acceptable to the Owner.

1.4 PROPOSAL REQUESTS

A. County-Initiated Proposal Requests: Owner will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
   1. Proposal Requests issued by Owner are not instructions either to stop Work in progress or to execute the proposed change.
   2. Within the time specified in Proposal Request or twenty calendar days, when not otherwise specified, after receipt of Proposal Request, submit a quote estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
      a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
      b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
      c. Include costs of labor and supervision directly attributable to the change.
      d. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
      e. Quotation Form: Use form acceptable to Owner.
B. Contractor-Initiated Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate such modification by submitting a request for a change to Owner.

1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
4. Include costs of labor and supervision directly attributable to the change.
5. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
6. Comply with requirements in Division 01 25 00 Section "Substitution Procedures" if the proposed change requires substitution of one product or system for product or system specified.
7. Proposal Request Form: Use form acceptable to Owner.

1.5 CHANGE ORDER PROCEDURES

A. On County's approval of a Proposal Request, Owner will issue a Change Order for signatures of County and Contractor on AIA Document G701, or similar form.

1.6 CONSTRUCTION CHANGE DIRECTIVE

A. Construction Change Directive: Owner may issue a Construction Change Directive on AIA Document G714 or similar form. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
   1. Construction Change Directive contains a complete description of change in the Work. It also designates the method to be followed to determine change(s) in the Contract Sum or the Contract Time.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 29 00 - PAYMENT PROCEDURES

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specifications Sections, apply to this Section.

1.2 SUMMARY

A. This Section specifies administrative and procedural requirements necessary to prepare and process Applications for Payment.
B. Related Requirements:
   1. Division 01 26 00 Section "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.
   2. Division 01 30 00 Section "Submittal Procedures" for administrative requirements governing the preparation and submittal of the submittal schedule

1.3 DEFINITIONS

A. Schedule of Values: A statement furnished by Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

1.4 SCHEDULE OF VALUES

A. Coordination: Coordinate preparation of the schedule of values with preparation of Contractor's construction schedule.
   1. Correlate line items in the schedule of values with other required administrative forms and schedules, including the following:
      a. Application for Payment forms with continuation sheets.
      b. Submittal schedule.
      c. Items required to be indicated as separate activities in Contractor's construction schedule.
   2. Submit the schedule of values to Owner at earliest possible date but no later than ten days before the date scheduled for submittal of initial Application for Payment.
   3. Sub-schedules for Separate Design Contracts: Where the County has retained design professionals under separate Contracts who will each provide certification of payment requests, provide sub-schedules showing values coordinated with the scope of each design services Contract as described in Division 01 Section 01 10 00 "Summary."
B. Format and Content: Use the Specification's table of contents as a guide to establish line items for the schedule of values. Provide at least one line item for each Specification Section. Provide additional detail as required or requested.
   1. Identification: Include the following Project identification on the schedule of values:
      a. Project name and location.
      b. Name of Owner.
      c. County's Project number.
      d. Contractor's name and address.
      e. Date of submittal.
   2. Arrange schedule of values consistent with format of AIA Document G703.

3. Arrange the schedule of values in tabular form with separate columns to indicate the following for each item listed:
   a. Item number.
   b. Description of the Work.
   c. Dollar value.
      1) Labor.
      2) Materials.
      3) Equipment.
4. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the Specification's table of contents. Provide at least two line items for principal subcontract amounts in excess of five percent of Contract Sum, as follows:
   a. Labor
   b. Equipment and material.
5. Include separate line items under Division 01 heading for prime Contract and principal subcontracts for Project's closeout requirements in an amount of at least five percent of the Contract Sum and Sub-contract amounts.
6. Round all amounts to nearest whole dollar; total shall equal the Contract Sum.
7. Provide a separate line item in the schedule of values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
   a. Differentiate between items stored on-site and items stored off-site.
8. Provide separate line items in the schedule of values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
9. Allowances: Provide a separate line item in the schedule of values for each allowance. Show line-item value of unit-cost allowances, as a product of the unit cost, multiplied by measured quantity. Use information indicated in the Contract Documents to determine quantities.
10. Purchase Contracts: Provide a separate line item in the schedule of values for each purchase Contract. Show line-item value of purchase Contract. Indicate County payments or deposits, if any, and balance to be paid by Contractor.
11. 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.
    a. Temporary facilities and other major cost items that are not direct cost of actual Work-in-place may be shown either as separate line items in the schedule of values or distributed as general overhead expense, at Contractor's option.
12. Schedule Updating: Update and resubmit the schedule of values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

1.5 APPLICATIONS FOR PAYMENT

A. Each Application for Payment shall be consistent with previous applications and payments as certified by Owner and paid for by County.

1. Initial Application for Payment, Application for Payment at time of Project Completion, and final Application for Payment involve additional requirements.

B. Payment Application Times: The date for each progress payment is indicated in the Agreement between County and Contractor. The period of construction Work covered by each Application for Payment is the period indicated in the Agreement.

C. Payment Application Times: Progress payments shall be submitted to Owner by the twenty-fifth day of the month. The period covered by each Application for Payment is one month, ending on the last day of the month.
   1. Submit draft copy of Application for Payment five days prior to due date for review by Owner.

D. Application for Payment Forms: Use forms acceptable to Owner and County for Applications for Payment. Submit forms for approval with initial submittal of schedule of values.

E. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Owner will return incomplete applications without action.
   1. Entries shall match data on the schedule of values and Contractor's construction schedule. Use updated schedules if revisions were made.
   2. Include amounts for Work completed following previous Application for Payment, whether or not payment has been received. Include only amounts for Work completed at time of Application for Payment.
   3. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
   4. Indicate separate amounts for Work being carried out under County-requested Project acceleration.

F. Stored Materials: Include in Application for Payment amounts applied for materials or equipment purchased or fabricated and stored, but not yet installed. Differentiate between items stored on-site and items stored off-site.
   1. Provide certificate of insurance, evidence of transfer of title to County, and consent of surety to payment, for stored materials.
   2. Provide supporting documentation that verifies amount requested, such as paid invoices. Match amount requested with amounts indicated on documentation; do not include overhead and profit on stored materials.
   3. Provide summary documentation for stored materials indicating the following:
      a. Value of materials previously stored and remaining stored as of date of previous Applications for Payment.
      b. Value of previously stored materials put in place after date of previous Application for Payment and on or before date of current Application for Payment.
      c. Value of materials stored since date of previous Application for Payment and remaining stored as of date of current Application for Payment.

G. Transmittal: Submit three signed and notarized original copies of each Application for Payment to Owner by a method ensuring receipt within 24 hours. County's copy shall include waivers of lien and similar attachments.
   1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.

H. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's lien from entities lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by the payment.
   1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
   2. When an application shows completion of an item, submit conditional final or full waivers.
   3. County reserves the right to designate which entities involved in the Work must submit waivers.
   4. Waiver Forms: Submit waivers of lien on forms complying with California law, executed in a manner acceptable to County.

I. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's liens from Subcontractors, Sub-subcontractors, and suppliers for construction period covered by the previous application.
   1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
   2. When an application shows completion of an item, submit conditional final or full waivers.
   3. County reserves the right to designate which entities involved in the Work must submit waivers.
   4. Submit final Application for Payment with or preceded by conditional final waivers from every entity involved with performance of the Work covered by the application who could be lawfully entitled to a lien.
   5. Waiver Forms: Submit waivers of lien on forms, executed in a manner acceptable to County.

J. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
   1. List of Subcontractors.
   2. Schedule of values.
   3. Contractor's construction schedule (preliminary if not final).
   4. Submittal schedule (preliminary if not final).
   5. List of Contractor's principal consultants.
   6. Copies of building permits.
   7. Initial progress report.
   8. Report of preconstruction conference.

K. Application for Payment at Project's Completion: Submit an Application for Payment showing 100 percent completion for portion of the Work claimed as complete.
   1. Include documentation supporting claim that the Work is complete and a statement showing an accounting of changes to the Contract Sum.
   2. This application shall reflect any Certificates of Partial Project Completion issued previously for County occupancy of designated portions of the Work.
   3. Submit all outstanding Labor Compliance documents and forms.

L. Final Payment Application: After completing Project closeout requirements, submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:
   1. Evidence of completion of Project closeout requirements.

2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
3. Updated final statement, accounting for final changes to the Contract Sum.
4. Final, unconditional lien releases (in exchange for final payment).
5. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims."
6. AIA Document G706A, "Contractor's Affidavit of Release of Liens."
7. AIA Document G707, "Consent of Surety to Final Payment."
8. Evidence that claims have been settled.
9. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Project Completion or when County took possession of and assumed responsibility for corresponding elements of the Work.
10. Final liquidated damages settlement statement.
11. Final Labor Compliance documents.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 30 00 - SUBMITTAL PROCEDURES

PART 1 – GENERAL

1.1 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, quality control items, and Labor Compliance 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, and procedures have been established for submittal of design data and for its review by Owner and/or others.

1.2 RELATED SECTIONS

A. Division 00 - General Conditions.
B. Section 01 31 00: Project Management and Coordination.
C. Section 01 50 00: Temporary Facilities and Controls.
D. Section 01 60 00: Product Requirements

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 – EXECUTION

3.1 ELECTRONIC DOCUMENT SUBMITTAL SERVICE

A. All documents transmitted for purposes of administration of the Contract are to be in electronic (PDF) format and transmitted via an Internet-based submittal service that receives, logs and stores documents, provides electronic stamping and signatures, and notifies addressees via email.
B. Besides submittals for review, information, and closeout, this procedure applies to requests for information (RFIs), progress documentation, Contract modification documents (e.g. supplementary instructions, change proposals, change orders), applications for payment, field reports and meeting minutes, and any other document any participant wishes to make part of the Project record.
C. It is Contractor's responsibility to submit documents in PDF format.
D. Paper document transmittals will not be reviewed (except Deferred Approvals and Close-Out Maintenance & Operations Manuals); emailed PDF documents will not be reviewed.
E. All other specified submittal and document transmission procedures apply, except that electronic document requirements to not apply to samples or color selection charts.

3.2 GENERAL REQUIREMENT AND PROCEDURES

A. Contractor shall package each submittal appropriately for transmittal and handling and will then send Construction Manager and County representative submittal for review per

the Project plans and specifications. Submittals will not be accepted from sources other than from Contractor.

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 Owner review, Owner shall transmit submittals to Contractor. Contractor shall further distribute to Subcontractor's and others as required. Work shall not commence, unless otherwise approved by Owner 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 Owner, (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:
    1. In accordance with General Conditions, Contractor shall submit to the Owner, those Shop Drawings, Product Data, diagrams, materials lists, Samples and other submittals required by the Contract Documents.
    2. The Contractor shall submit within five (5) 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.
    3. Schedule of submittals shall be related to Work progress, and shall be so organized as to allow sufficient time for transmitting, reviewing, corrections, resubmission, and re-reviewing.
    4. Contractor shall coordinate submittal of related items and Owner reserves the right to withhold action on a submittal requiring coordination with other submittals until all related submittals are received by Owner.
    5. Contractor shall revise, update and submit submittal schedule to Owner on the first of each month, or as required by the County.
    6. Contractor shall allow in the Construction Schedule, at least fourteen (14) calendar days for Owner review following Owner receipt of submittal. For mechanical, plumbing, electrical, structural, and other submittals requiring joint review with Owner's Consultants, and/or others, Contractor shall allow a minimum of eighteen (18) calendar days following Owner receipt of submittal. Submittals will be reviewed with reasonable promptness, but Owner reserves the right of additional time where required based on, but not limited to, submittal size, and complexity.

7. No adjustments to the Contract Time and/or Milestones shall be authorized because of a failure to transmit submittals to Owner sufficiently in advance of the Work to permit review and processing.
8. In case of product substitution, Shop Drawing preparation shall not commence until such time Owner reviews said submittal relative to the General Conditions.

G. 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. Owner, or authorized agent, will stamp each submittal with a uniform, action stamp marking the stamp appropriately to indicate the action taken, as follows:
   1. Final Unrestricted Release: When Owner, 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 Owner, or authorized agent, marks a submittal "Make Corrections Noted" (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 Owner, or authorized agent, marks a submittal "Revise and Resubmit, Submit Specified Item, Rejected" 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's 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 Owner, or authorized agent, will return the submittal marked "Action Not Required".
   5. Not Required Submittal: Where a submittal is submitted for review but is not required to be submitted, the Owner, or authorized agent, will return the submittal identified with legend "No Action Taken".

I. Review and Approval of Submittals by the Owner: 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. Approval of a separate item as such will not indicate approval of the assembly in which the item functions. Approval of submittals shall not relieve the Contractor of responsibility for any 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.

3.3 SHOP DRAWINGS

A. Shop Drawings are original drawings in electronic format (except Deferred Approvals to be hard copies) 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 not be reviewed and shall be promptly returned to the Contractor.

B. Produce Deferred Approval Shop Drawings to an accurate scale that is large enough to indicate all pertinent features and methods. Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 24 x 36 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.

D. Provide two (2) spaces, approximately 4 by 5 inches, on the label or beside the title block on Shop Drawings to record Contractor and Owner 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 Owner.
   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.

3.4 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.

3.5 SAMPLES

A. Submit Samples of sufficient size, quantity, 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 County property, remain the property of Contractor and shall be removed from the Project's site prior to Beneficial Occupancy.
   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 Owner for review and selection by Owner.
   4. Required Copies and Distribution: Same as denoted in Section 3.02.

A. 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.
B. 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.

3.6 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.

3.7 CERTIFICATES

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

END OF SECTION

SECTION 01 31 00 - PROJECT MANAGEMENT AND COORDINATION

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
   1. General Project coordination procedures.
   2. Coordination drawings.
   3. Requests for Interpretation (RFIs).
   4. Project meetings.

B. Related Requirements:
   1. All the Division 01 sections, but especially the following:
   2. Division 01 30 00 Submittal Procedures.
   3. Division 01 70 00 Section "Execution" for procedures for coordinating general installation and field-Engineering services, including establishment of benchmarks and control points.
   4. Division 01 78 00 Section "Closeout Procedures" for coordinating closeout of the Contract.

1.3 DEFINITIONS

A. RFI: Request For Interpretation (RFI) from Owner or Contractor, seeking information from each other during construction.

1.4 INFORMATIONAL SUBMITTALS

A. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:
   1. Name, address, and telephone number of entity performing Subcontract or supplying products.
   2. Number and title of related Specification Section(s) covered by Subcontract.
   3. Drawing number and detail references, as appropriate, covered by Subcontract.

1.5 GENERAL COORDINATION PROCEDURES

A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections that depend on each other for proper installation, connection, and operation.
   1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.

2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
3. Make adequate provisions to accommodate items scheduled for later installation.

B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
   1. Prepare similar memoranda for County and separate Contractors if coordination of their Work is required.

C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
   1. Preparation of Contractor's construction schedule.
   2. Preparation of the schedule of values.
   3. Installation and removal of temporary facilities and controls.
   4. Delivery and processing of submittals.
   5. Progress meetings.
   6. Pre-installation conferences.
   7. Project closeout activities.
   8. Startup and adjustment of systems.

D. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.
   1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. Refer to other Sections for disposition of salvaged materials that are designated as County's property.

1.6 COORDINATION DRAWINGS

A. Coordination Drawings, General: Prepare coordination drawings in accordance with requirements in individual Sections, where installation is not completely shown on Shop Drawings, where limited space availability necessitates coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity.
   1. Content: Project-specific information, drawn accurately to a scale large enough to indicate and resolve conflicts. Prepare coordination drawings to comply with accepted industry drafting standards. Do not base coordination drawings on standard printed data. Include the following information, as applicable:
      a. Applicable Drawings may be used as a basis for preparation of coordination drawings, provide title blocks, stamps and certifications are removed. Prepare additional sections, elevations, and details as needed to describe relationship of various systems and components.
         1) Provide review stamp, with signature and date, of each trade proposed to Work within the opening or penetration.
      b. Coordinate the addition of trade-specific information to the coordination drawings by multiple Contractors in a sequence that best provides for coordination of the information and resolution of conflicts between installed components before submitting for review.

1) Provide review stamp, with signature and date, of each Contractor and trade proposed to Work within the opening or penetration.

c. Indicate functional and spatial relationships of components of Engineering, structural, civil, mechanical, and electrical systems.
   1) Grid lines and levels, and references to appropriate Contract drawings.
   2) Location and dimensions of openings and penetrations.

d. Indicate dimensions shown on the Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternate sketches to Engineer indicating proposed resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.

e. Indicate space requirements for routine maintenance and for anticipated replacement of components during the life of the installation.

f. Show location and size of access doors required for access to concealed dampers, valves, and other controls.

g. Indicate required installation sequences.

B. Coordination Drawing Organization: Organize coordination drawings as follows:
   1. Floor Plans and Reflected Ceiling Plans: Show Engineering and structural elements, and mechanical, plumbing, fire protection, fire alarm, and electrical Work. Show locations of visible ceiling-mounted devices relative to acoustical ceiling grid. Supplement plan drawings with section drawings where required to adequately represent the Work.
   2. Review: Owner will review coordination drawings to confirm that the Work is being coordinated, but not for the details of the coordination, which are the Contractor's responsibility. If the Owner determines that the coordination drawings are not being prepared in sufficient scope or detail, or are otherwise deficient, the Owner will so inform the Contractor, who shall make changes as directed and resubmit.
   3. Coordination Drawing Prints: Prepare coordination drawing prints in accordance with requirements of Division 01 Section "Submittal Procedures."

C. Coordination Digital Data Files: At Contractor's option, prepare coordination digital data files in accordance with the requirements of Division 01 Section "Submittal Procedures."
   1. File Preparation Format: DWG, Version, operating in Microsoft Windows operating system.

1.7 REQUESTS FOR INTERPRETATION (RFIs)

A. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.
   1. Owner will return RFIs submitted to Owner by other entities controlled by Contractor with no response.
   2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's Work or Work of Subcontractors.
   3. Submit one item for each RFI number.

B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:
   1. Project name.
   2. Project number.

3. Date.
4. Name of Contractor.
5. Name of Owner
6. RFI number, numbered sequentially.
7. RFI subject.
8. Specification Section number and title and related paragraphs, as appropriate.
9. Drawing number and detail references, as appropriate.
10. Field dimensions and conditions, as appropriate.
11. Contractor's suggested resolution. If Contractor's solution(s) impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
12. Contractor's signature.
13. Attachments: Include sketches, descriptions, measurements, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.
    a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.
    b. Photographs shall not be accepted as a substitute for Engineering sketches. Photographs may be submitted as supplements to properly prepared sketches and coordination drawings.

C. RFI Forms: Software-generated form acceptable to Owner.
   1. Attachments shall be electronic files in Adobe Acrobat PDF format.

D. Owner's and Owner's Action: Owner and Construction Manager will review each RFI, determine action required, and respond. Allow ten (10) calendar days for Engineer's response for each RFI.
   1. The types of RFIs listed below will be returned without action. The RFI process is not the proper mechanism to address such topics. Submit requests under appropriate procedures outlined in Contract Document.
      a. Requests for approval of submittals.
      b. Requests for approval of substitutions.
      c. Requests for approval of Contractor's means and methods.
      d. Requests for coordination information already indicated in the Contract Documents.
      e. Requests for adjustments in the Contract Time or the Contract Sum.
      f. Requests for interpretation of Owner's actions on submittals.
      g. Incomplete RFIs or inaccurately prepared RFIs.
   2. Owner's action may include a request for additional information, in which case Owner's time for response will date from time of receipt of additional information.
   3. Owner's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Division 01 26 00 Section "Contract Modification Procedures."
      a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Owner in writing within eight calendar days of receipt of the RFI response.
   4. Name and address of Owner.
   5. Date Owner's and Owner's response was received.

E. On receipt of Owner's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Owner within eight calendar days if Contractor disagrees with response.

1. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.
2. Identification of related Field Order, Work Change Directive, and Proposal Request, as appropriate.

1.8 PROJECT MEETINGS

A. General: Owner will schedule and conduct basic meetings and conferences at Project site, unless otherwise indicated.
   1. Attendees: Entity responsible for conducting meeting shall inform participants and others involved, and individuals whose presence is required, of date and time of each meeting.
   2. Agenda: Entity responsible for conducting meeting shall prepare and distribute the meeting agenda.
   3. Minutes: Entity responsible for conducting meeting shall record significant discussions and agreements achieved, and distribute the meeting minutes to everyone concerned, within seven calendar days of the meeting.

B. Preconstruction Conference: Owner shall schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner, but no later than fifteen calendar days after execution of the Agreement.
   1. Conduct the conference to review responsibilities and personnel assignments.
   2. Attendees: Owner and Owner's consultants; Contractor and its superintendent; major Subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
   3. Agenda: Discuss items of significance that could affect progress, including the following:
      a. Tentative construction schedules, including overall and rolling schedules
      b. Designation of key personnel and their duties.
      c. Lines of communications.
      d. Procedures for processing field decisions and Change Orders.
      e. Procedures for RFIs.
      f. Procedures for testing and inspecting.
      g. Procedures for processing Applications for Payment.
      h. Distribution of the Contract Documents.
      i. Submittal procedures.
      j. Sustainable design requirements.
      k. Use of the premises.
      l. Work restrictions.
      m. Working hours.
      n. County's occupancy requirements.
      o. Responsibility for temporary facilities and controls.
      p. Procedures for moisture and mold control.
      q. Procedures for disruptions and shutdowns.
      r. Construction waste management and recycling.
      s. Parking availability.
      t. Office, Work, and storage areas.
      u. Equipment deliveries and priorities.
      v. First aid.

w. Security.
x. Progress cleaning.
y. Labor law, including payment and reporting requirements.

4. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.

C. Project Closeout Conference: The Project closeout conference shall review requirements and responsibilities related to Project closeout.
1. If not conducted as part of a normally scheduled job progress meeting, Owner shall schedule and conduct a Project closeout conference, at a time convenient to Owner and Contractor, but no later than thirty calendar days prior to the scheduled date of Project Completion.
2. Attendees: Authorized representatives of Owner, Contractor and its superintendent; major Subcontractors; suppliers; and other concerned parties shall attend the meeting. Participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
3. Agenda: Discuss items of significance that could affect or delay Project closeout, including the following:
a. Preparation of record documents.
b. Procedures required prior to inspection for Project Completion and for final inspection for acceptance.
c. Submittal of written warranties.
d. Requirements for completing sustainable design documentation.
e. Requirements for preparing operations and maintenance data.
f. Requirements for delivery of material samples, attic stock, and spare parts.
g. Requirements for demonstration and training.
h. Preparation of Contractor's punch list.
i. Procedures for processing Applications for Payment at Project Completion and for final payment.
j. Submittal procedures.
k. Coordination of separate Contracts.
l. Requirements for completing sustainable design documentation.
m. County's partial occupancy requirements.
n. Installation of County's furniture, fixtures, and equipment.
o. Responsibility for removing temporary facilities and controls.
4. Minutes: Entity conducting meeting shall record and distribute meeting minutes.

D. Progress Meetings: Owner shall conduct progress meetings as needed.
1. Coordinate preparation of payment requests with dates of meetings.
2. Attendees: In addition to representatives of Owner, each Contractor, Subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
3. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule,

in relation to Contractor's construction schedule. Determine how construction behind schedule shall be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities shall be completed within the Contract Time.

1) Review schedule for next period.

b. Review present and future needs of each entity present, including the following:
   1) Interface requirements.
   2) Sequence of operations.
   3) Resolution of BIM component conflicts.
   4) Status of submittals.
   5) Status of sustainable design documentation.
   6) Deliveries.
   7) Off-site fabrication.
   8) Access.
   9) Site utilization.
   10) Temporary facilities and controls.
   11) Progress cleaning.
   12) Quality and Work standards.
   13) Status of correction of deficient items.
   14) Field observations.
   15) Status of RFIs.
   16) Status of proposal requests.
   17) Pending changes.
   18) Status of Change Orders.
   19) Pending claims and disputes.
   20) Documentation of information for payment requests.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

REQUEST FOR INTERPRETATION

Project Name:			RFI No.
To:		Contractor:	
Subject:			
Specified Section	Paragraph No.	Drawing No.	Detail No.
Category: ☐ Need for Clarification ☐ Unforeseen Condition ☐ Conflict Within Documents		☐ Coordination Problem ☐ Other	
Description:			
Contractor's Proposed Resolution:			
☐ Attachments: ☐ Cost Impact: $ (Estimated) ☐ Time Impact:			
Contractor Signature			Date:
Engineer's Response:			
☐ Attachments:			
Engineer Signature:			Date:

SECTION 01 50 00 - TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Temporary utilities.
B. Temporary sanitary facilities.
C. Temporary Controls: Barriers, enclosures, and fencing.
D. Security requirements.
E. Vehicular access and parking.
F. Waste removal facilities and services.

1.2 RELATED REQUIREMENTS

A. N/A

1.3 TEMPORARY UTILITIES

A. Provide and pay for all electrical power, lighting, water, ventilation, and janitorial service and supplies required for construction purposes.
B. Use trigger-operated nozzles for water hoses, to avoid waste of water.

1.4 TEMPORARY SANITARY FACILITIES

A. Provide and maintain required facilities and enclosures.
B. Provide at time of Project mobilization.
C. Provide sanitary facilities within each office trailer where office trailer is provided.
D. Maintain daily in clean and sanitary condition.
E. At end of construction, return facilities to same or better condition as originally found.

1.5 BARRIERS

A. Provide barriers to prevent unauthorized entry to construction areas, to prevent access to areas that could be hazardous to Workers or the public and to protect existing facilities and adjacent properties from damage from construction operations and demolition.
B. Provide barricades and covered walkways required by governing authorities for public rights-of-way and for public access to existing building.
C. Provide protection for landscape plantings designated to remain. Replace damaged plants.
D. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.
E. Traffic Controls: As needed per local authorities.

1.6 SECURITY

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

1.7 VEHICULAR ACCESS AND PARKING

A. Comply with regulations relating to use of streets and sidewalks, access to emergency facilities, and access for emergency vehicles.
B. Coordinate access and haul routes with Construction Manager.
C. Provide and maintain access to fire hydrants, free of obstructions.

1.8 WASTE REMOVAL

A. See Section 01 74 19 - Construction Waste Management and Disposal, for additional requirements.
B. Provide waste removal facilities and services as required to maintain the site and all temporary facilities in clean and orderly condition.
C. Provide containers with lids. Remove trash from site weekly, or as needed.
D. If materials to be recycled or re-used on the Project must be stored on-site, provide suitable non-combustible containers; locate containers holding flammable material outside the structure unless otherwise approved by the authorities having jurisdiction.

1.9 PROJECT TEMPORARY SIGNS - None

1.10 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

A. Remove temporary utilities, equipment, facilities, materials, prior to Final Application for Payment inspection.
B. Clean and repair damage caused by installation or use of temporary Work.
C. Restore existing facilities used during construction to original condition.
D. Restore new permanent facilities used during construction to specified condition.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 01 60 00 - PRODUCT REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. General product requirements.
B. Sustainable design-related product requirements.
C. Transportation, handling, storage and protection.
D. Product option requirements.
E. Substitution limitations and procedures.
F. Procedures for County-supplied products.
G. Maintenance materials, including extra materials, spare parts, tools, and software.

1.2 RELATED REQUIREMENTS

A. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions: Requirements for VOC-restricted product categories.
B. Section 01 74 19 - Construction Waste Management and Disposal: Waste disposal requirements potentially affecting packaging and substitutions.

1.3 REFERENCE STANDARDS

A. NFPA 70 - National Electrical Code; National Fire Protection Association; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.4 SUBMITTALS

A. Proposed Products List: Submit list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.
   1. For products specified only by reference standards, list applicable reference standards.
B. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.
C. Shop Drawing Submittals: Prepared specifically for this Project; indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.
D. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing Work.
   1. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.

PART 2 PRODUCTS

2.1 NEW PRODUCTS

A. Provide new products unless specifically required or permitted by the Contract Documents.
B. DO NOT USE products having any of the following characteristics:

2. Made using or containing CFC's or HCFC's.
3. Contain asbestos or lead-base paint:
    a. No materials shall be used in this Project or in any tools, devices, clothing or equipment used to affect this construction that contain asbestos or lead-based paint. All Work or materials found to contain asbestos or lead-base paint, or material installed with asbestos containing equipment or lead-base paint will be immediately rejected and this Work shall be removed by a certified EPA hazard material Contractor under the supervision of a certified hazard material consultant at no additional cost to County.
    b. Contractor and Subcontractors shall certify that no asbestos containing materials and no lead-base paint were used in this Project. Certification letter must be addressed to County, including Project and Contractors' information; to be notarized.

C. Where all other criteria are met, Contractor shall give preference to products that:
1. If used on interior, have lower emissions, as defined in Section 01 61 16.
2. If wet-applied, have lower VOC content, as defined in Section 01 61 16.
3. Are extracted, harvested, and/or manufactured closer to the location of the Project.
4. Have longer documented life span under normal use.
5. Result in less construction waste.

2.2 PRODUCT OPTIONS

A. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.
B. Products Specified by Naming One or More Manufacturers: Use a product of one of the manufacturers named and meeting specifications, no options or substitutions allowed. Where Basis of Design product is identified, it shall establish the level of quality for proposed equal products.
C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.
D. Equivalent Products: For products specified by name and accompanied by the term "approved equivalent," "or equal," or "or approved equal," or "or approved," comply with requirements in "Comparable Products" Article to obtain approval for use of an unnamed product.

2.3 MAINTENANCE MATERIALS

A. Furnish extra materials, spare parts, tools, and software of types and in quantities specified in individual specification sections.
B. Deliver to Project site; obtain receipt prior to final payment.

PART 3 EXECUTION

3.1 SUBSTITUTION PROCEDURES

A. See Section 01 2500 Substitution Procedures.
B. Instructions to Bidders specify time restrictions for submitting requests for substitutions during the bidding period. Comply with requirements specified in that section.

3.2 COUNTY-SUPPLIED PRODUCTS

A. County's Responsibilities:
   1. Arrange for and deliver County reviewed shop drawings, product data, and samples, to Contractor.
   2. Arrange and pay for product delivery to site.
   3. On delivery, inspect products jointly with Contractor.
   4. Submit claims for transportation damage and replace damaged, defective, or deficient items.
B. Contractor's Responsibilities:
   1. Review County reviewed shop drawings, product data, and samples.
   2. Receive and unload products at site; inspect for completeness or damage jointly with County.
   3. Handle, store, install and finish products.
   4. Repair or replace items damaged after receipt.

3.3 TRANSPORTATION AND HANDLING

A. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.
B. Transport and handle products in accordance with manufacturer's instructions.
C. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.
D. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.
E. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.
F. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

3.4 STORAGE AND PROTECTION

A. Designate receiving/storage areas for incoming products so that they are delivered according to installation schedule and placed convenient to Work area in order to minimize waste due to excessive materials handling and misapplication.
B. Store and protect products in accordance with manufacturers' instructions.
C. Store with seals and labels intact and legible.
D. Store sensitive products in weather tight, climate controlled, enclosures in an environment favorable to product.
E. For exterior storage of fabricated products, place on sloped supports above ground.
F. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.
G. Prevent contact with material that may cause corrosion, discoloration, or staining.
H. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
I. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

END OF SECTION

SECTION 01 61 16 - VOLATILE ORGANIC COMPOUND (VOC) CONTENT RESTRICTIONS

PART 1 GENERAL

1.1 SECTION INCLUDES

1.2 RELATED REQUIREMENTS
A. Section 01 30 00 - Administrative Requirements: Submittal procedures.
B. Section 01 60 00 - Product Requirements: Fundamental product requirements, substitutions and product options, delivery, storage, and handling.

1.3 DEFINITIONS
A. Interior of Building: Anywhere inside the exterior weather barrier.

1.4 REFERENCE STANDARDS
A. CAL (CDPH SM) - Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions From Indoor Sources Using Environmental Chambers; California Department of Public Health; v1.1, 2010.
B. CRI (GLP) - Green Label Plus Testing Program - Certified Products; Carpet and Rug Institute; Current Edition.

1.5 SUBMITTALS
A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
B. Product Data: For each VOC-restricted product used in the Project, submit evidence of compliance.

PART 2 PRODUCTS

2.1 MATERIALS
A. All Products: Comply with the most stringent of Federal, State, and local requirements, or these specifications.

PART 3 EXECUTION

3.1 FIELD QUALITY CONTROL
A. County reserves the right to reject non-compliant products, whether installed or not, and require their removal and replacement with compliant products at no extra cost to County.
B. All additional costs to restore indoor air quality due to installation of non-compliant products shall be borne by Contractor.

END OF SECTION

SECTION 01 70 00 - EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Examination, preparation, and general installation procedures.
B. Cutting and patching.
C. Surveying for laying out the Work.
D. Cleaning and protection.
E. Closeout procedures

1.2 RELATED REQUIREMENTS

A. Section 01 74 19 - Construction Waste Management and Disposal: Additional procedures for trash/waste removal, recycling, salvage, and reuse.
B. Section 01 78 00 - Closeout Submittals 01 78 00: Project record documents, operation and maintenance data, warranties and bonds.

1.3 REFERENCE STANDARDS

A. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2013.

1.4 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
B. Survey Work:
   1. Submit a copy of site drawing signed by the Land Surveyor, showing that the elevations and locations of the Work are in conformance with Contract Documents.
   2. Submit surveys and survey logs for the Project record.
C. Cutting and Patching: Submit written request in advance of cutting or alteration that affects:
   1. Structural integrity of any element of Project.
   2. Integrity of weather exposed or moisture resistant element.
   3. Efficiency, maintenance, or safety of any operational element.
   4. Visual qualities of sight exposed elements.
   5. Work of County or separate Contractor.
D. Project Record Documents: Accurately record actual locations of capped and active utilities.

1.5 PROJECT CONDITIONS

A. Use of explosives is not permitted.
B. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion.
C. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.
D. Dust Control: Execute Work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere and over adjacent property.

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

1.6 COORDINATION

A. Coordinate scheduling, submittals, and Work of the various sections of the Specifications to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.
B. Notify affected utility companies and comply with their requirements.
C. Verify that utility requirements and characteristics of new operating equipment are compatible with building utilities. Coordinate Work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
D. Coordinate space requirements, supports, and installation of mechanical and electrical Work that are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
E. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.
F. Coordinate completion and clean-up of Work of separate sections.
G. After County occupancy of premises, coordinate access to site for correction of defective Work and Work not in accordance with Contract Documents, to minimize disruption of County's activities.

PART 2 PRODUCTS

2.1 PATCHING MATERIALS

A. New Materials: As specified in product sections; match existing products and Work for patching and extending Work.
B. Type and Quality of Existing Products: Determine by inspecting and testing products where necessary, referring to existing Work as a standard.
C. Product Substitution: For any proposed change in materials, submit request for substitution described in Section 01 60 00 - Product Requirements.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent Work. Start of Work means acceptance of existing conditions.
B. Verify that existing substrate is capable of structural support or attachment of new Work being applied or attached.
C. Examine and verify specific conditions described in individual specification sections.
D. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or miss-fabrication.

E. Verify that utility services are available, of the correct characteristics, and in the correct locations. Furnish information to local utility and County where necessary to adjust, move, or relocate existing utilities and appurtenances.
F. Prior to Cutting: Examine existing conditions prior to commencing Work, including elements subject to damage or movement during cutting and patching. After uncovering existing Work, assess conditions affecting performance of Work. Beginning of cutting or patching means acceptance of existing conditions.

1.2 PREPARATION

A. Clean substrate surfaces prior to applying next material or substance.
B. Seal cracks or openings of substrate prior to applying next material or substance.
C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

1.3 LAYING OUT THE WORK

A. Verify locations of survey control points prior to starting Work.
B. Promptly notify Construction Manager of any discrepancies discovered.
C. Contractor shall locate and protect survey control and reference points.
D. Control datum for survey is that indicated on Drawings.
E. Protect survey control points prior to starting site Work; preserve permanent reference points during construction.
F. Promptly report to Construction Manager the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.
G. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Construction Manager.
H. Utilize recognized Engineering survey practices.
I. Establish elevations, lines and levels. Locate and lay out by instrumentation and similar appropriate means:
    1. Site improvements including pavements; stakes for grading, fill and topsoil placement; utility locations, slopes, and invert elevations.
    2. Grid or axis for structures.
    3. Building foundation, column locations, ground floor elevations.
J. Periodically verify layouts by same means.
K. Maintain a complete and accurate log of control and survey Work as it progresses.
L. On completion of foundation walls and major site improvements, prepare a certified survey illustrating dimensions, locations, angles, and elevations of construction and site work.

1.4 GENERAL INSTALLATION REQUIREMENTS

A. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.
B. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.
C. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.

D. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.
E. Make neat transitions between different surfaces, maintaining texture and appearance.

1.5 CUTTING AND PATCHING

A. Whenever possible, execute the Work by methods that avoid cutting or patching.
B. Perform whatever cutting and patching is necessary to:
   1. Complete the Work.
   2. Fit products together to integrate with other Work.
   3. Provide openings for penetration of mechanical, electrical, and other services.
   4. Match Work that has been cut to adjacent Work.
   5. Repair areas adjacent to cuts to required condition.
   6. Repair new Work damaged by subsequent Work.
   7. Remove samples of installed Work for testing when requested.
   8. Remove and replace defective and non-conforming Work.
C. Execute Work by methods that avoid damage to other Work and that will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.
D. Employ original installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.
E. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.
F. Restore Work with new products in accordance with requirements of Contract Documents.
G. Fit Work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
H. Patching:
   1. Finish patched surfaces to match finish that existed prior to patching. On continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
   2. Match color, texture, and appearance.
   3. Repair patched surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching Work. If defects are due to condition of substrate, repair substrate prior to repairing finish.

3.7 PROGRESS CLEANING

A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.
B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.
C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.
D. Collect and remove waste materials, debris, and trash/rubbish from site periodically and dispose off-site; do not burn or bury.

3.8 PROTECTION OF INSTALLED WORK

A. Protect installed Work from damage by construction operations.
B. Provide special protection where specified in individual specification sections.
C. Provide temporary and removable protection for installed products. Control activity in immediate Work area to prevent damage.
D. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
E. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.
F. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.
G. Remove protective coverings when no longer needed; reuse or recycle plastic coverings if possible.

3.9 DEMONSTRATION AND INSTRUCTION (Not used)

3.10 ADJUSTING (Not used)

3.11 FINAL CLEANING

A. Execute final cleaning prior to Substantial Completion.
B. Use cleaning materials that are nonhazardous.
C. Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.
D. Remove all labels that are not permanent. Do not paint or otherwise cover fire test labels or nameplates on mechanical and electrical equipment.
E. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.
F. Clean filters of operating equipment.
G. Clean debris from roofs, gutters, downspouts, scuppers, overflow drains, area drains, and other drainage systems.
H. Clean site; sweep paved areas, rake clean landscaped surfaces.
I. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury.

3.12 CLOSEOUT PROCEDURES

A. Make submittals that are required by governing or other authorities.
    1. Provide copies to Construction Manager.
A. Submit a written request for final review for acceptance. On receipt of request, Construction Manager will either proceed with review or notify Contractor of unfulfilled requirements. Construction Manager will notify Contractor of construction that must be completed or corrected.
    1. Re-review: Request re-review when the Work identified in previous reviews as incomplete is completed or corrected.
    2. Following completion of all final review items, Contactor shall prepare and submit a final Certificate for Payment.

END OF SECTION

SECTION 01 73 29 - CUTTING AND PATCHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SECTION INCLUDES

A. Requirements and limitations for cutting and patching of Work.

B. Contractor shall be responsible for cutting, fitting and patching required to complete the following work:
   1. Make its parts fit together properly.
   2. Uncover work to provide for installation of ill-timed work.
   3. Remove and replace defective work.
   4. Remove and replace work not conforming to Contract Documents.
   5. Remove samples of installed work as required for testing.
   6. Provide routine penetrations of non-structural surfaces for installation of piping and electrical conduit. In-fill and patch openings left by removal of piping, conduit, etc.

C. Coordinate unanticipated cutting and demolition with the Construction Manager prior to executing work.

D. Provide special care to protect the areas of the building to be retained. Match surrounding materials and finishes.

E. Contractor shall be responsible for patching of existing walls and ceilings to a reasonably smooth condition. This may require the removal and cutting of existing ceiling framing, hangers and brackets and patching of the remaining indents and holes.
   1. Contractor shall be responsible for cutting, fitting and patching required to complete Work.
   2. Coordinate unanticipated cutting and demolition with the Contracting Officer prior to execution of the work.
   3. Provide special care to protect the historic fabric of the buildings scheduled to be retained. Match surrounding materials and finishes.

1.3 RELATED SECTIONS

A. Section 01 11 00 - Summary of Work: Work by County or by separate contractors.

B. Section 01 25 13 – Product Substitution Procedures.

C. Section 01 33 00 – Submittals Procedures.

D. Individual Product Specification Sections:
   1. Cutting and patching incidental to work of the Section.

2. Advance notification to other Sections of openings required in work of those Sections.
3. Limitations on cutting structural and other types of members.

1.4 SUBMITTALS

A. Shop Drawings: Submit prior to cutting of any structurally or visually significant portion of the Work which is not specifically shown on the Drawings. Obtain written permission for exact location and size of openings from the Construction Manager.
1. Before cutting into any portion of the structure, obtain written permission from the Construction Manager for each hole to be cut or enlarged. Submit shop drawings indicating exact location and size of detail of reinforcement of such openings.

B. Submit written request in advance of cutting or alteration which affects:
1. Structural integrity of any element of Project.
2. Integrity of weather-exposed or moisture-resistant element.
3. Efficiency, maintenance, or safety of any operational element.
4. Visual qualities of sight exposed elements.
5. Work of County or separate contractor.

C. Include in request:
1. Identification of Project.
2. Location and description of affected work.
3. Necessity for cutting or alteration.
4. Description of proposed work, and products to be used.
5. Alternatives to cutting and patching.
6. Effect on work of County or separate contractor.
7. Written permission of affected separate contractor.
8. Date and time work will be executed.

1.5 QUALITY ASSURANCE

A. Standards: Refer to Specification Sections.

1.6 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

2.1 MATERIALS

A. Primary Products: Identical to those required for original installation.
1. For exposed surfaces, use materials that virtually match existing adjacent surfaces to fullest extent possible if identical materials are unavailable or cannot be used.
2. Use materials whose installed performance will equal or surpass that of existing materials.

B. Product Substitution: For any proposed change in materials, submit request for substitution under provisions of Section 01 25 13.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Inspect existing conditions prior to commencing Work, including elements subject to damage or movement during cutting and patching.

B. After uncovering existing work, inspect conditions affecting performance of work.

C. Report unsatisfactory or questionable conditions to Construction Manager in writing; do not proceed with work until Construction Manager has provided further instruction.

D. Beginning of cutting or patching means acceptance of existing conditions.

3.2 PREPARATION

A. Provide temporary supports to ensure structural integrity of the Work. Provide devices and methods to protect other portions of Project from damage.

B. Provide protection from elements for areas which may be exposed by uncovering work.

C. Maintain excavations free of water.

D. Avoid cutting existing pipes, conduit, or ductwork serving building but scheduled to be removed or relocated until provisions have been made to bypass them.

E. Employ skilled workmen to perform cutting and patching. Proceed with cutting and patching at earliest feasible time and complete.
   1. Cut existing construction to provide for installation of other components or performance of other construction activities and subsequent fitting and patching required to restore surfaces to original condition.

3.3 PERFORMANCE

A. Execute work by methods to avoid damage to other Work, and which will provide appropriate surfaces to receive patching and finishing.

B. When warranty may be affected by alterations to original installation of weather exposed and moisture resistant elements, and sight-exposed surfaces, employ original installer to perform cutting and patching.

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

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

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

F. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material in accordance with Section 07_84_00, to full thickness of the penetrated element.

3.4 CUTTING AND PATCHING

A. General: Execute cutting, fitting, and patching including excavation and fill to complete work.
1. Fit products together, to integrate with other work.
2. Uncover work to install ill-timed work.
3. Remove and replace defective or non-conforming work.
4. Remove samples of installed work for testing when requested.
5. Provide openings in the work for penetration of mechanical and electrical work.

B. Cutting:
1. Perform cutting, associated structural reinforcing, and patching in a manner to prevent damage to other Work, and to provide proper surfaces for the installation of new materials, equipment and repairs. Adjust and fit products to provide a neat installation.
2. Cut rigid materials using masonry saw or core drill. Pneumatic tools are not allowed without prior written approval.

C. Gypsum Board and Plaster: At the Contractor's option, on existing walls and ceilings designated for cutting and patching work, the Contractor may use any of the following methods, or combination thereof, to match adjacent wall plane and finish, and as required to meet the required fire ratings:
1. Patch gypsum board walls or ceilings with new gypsum board the same thickness as existing surface.
2. Patch plaster walls or ceilings using plaster to match and align with the adjacent surface thickness.
3. Remove entire gypsum board or plaster surface plane and replace with new gypsum board to the corner of the wall or ceiling plane.

D. At partitions and ceilings indicated as "existing to remain", provide modification of finishes for new Work including, but not necessarily limited to, acoustical treatment, electrical, plumbing, etc. See Drawings for extent of work.
1. At Contractor's option, where modifications are required, finishes may be cut and patched, or removed and replaced on one or both sides.

E. Patching:
1. Patch surfaces to match adjacent surfaces. Finish to nearest intersection. For an assembly, refinish entire unit.
2. Patch to achieve security; strength; weather protection, as applicable; efficiency, operational life, maintenance, and safety of operational elements; and to preserve continuity of existing fire ratings.
3. Patch surfaces to successfully duplicate undisturbed adjacent profiles, materials, textures, finishes and colors. Use materials which match existing construction.
4. Where there is dispute as to whether duplication is successful or has been achieved to a reasonable degree, the Construction Manager's decision will be final.
5. Fit work to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

6. At penetrations of fire-rated walls, partitions, ceilings, and floor construction completely seal voids with fire-rated material in accordance with Section 07 8400, and U.L. specifications to full thickness of the penetrated element.

3.5 FINISHING

A. Finish or refinish, as applicable, cut and patched surfaces to match adjacent finishes. Replace materials which are damaged or abused and cannot be neatly repaired as a result of cutting and patching operations.

B. Refinish entire surfaces as necessary to provide even finish to match adjacent finishes:
   1. For continuous surfaces, refinish to nearest intersection or natural break.
   2. For an assembly, refinish entire unit.

C. Painting: Paint over complete surface planes, unless otherwise indicated or directed. Over patched wall and ceiling surfaces, paint to nearest cutoff line for entire surface, such as the intersection with adjacent wall or ceiling, beam, or to nearest opening frame, unless otherwise indicated or directed. Painted surfaces shall not appear spotty or touched-up.

END OF SECTION

SECTION 01 74 19 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 GENERAL

1.1 WASTE MANAGEMENT REQUIREMENTS

A. The Contractor shall review, understand and apply the requirements of the County's Municipal Code Title 30.
B. County requires that this Project generate the least amount of trash and waste possible.
C. County requires that this Project use one of the commercial haulers authorized to collect waste and recycling in Hamilton City.
D. Comply with Section 5.408 Construction Waste Reduction, Disposal and Recycling, and 5.408.3.1 Enhanced construction waste reduction – Tier 1, of the 2016 California Green Building Standards Code.
E. Employ processes that ensure the generation of as little waste as possible due to error, poor planning, breakage, mishandling, contamination, or other factors.
F. Minimize trash/waste disposal in landfills; reuse, salvage, or recycle as much waste as economically feasible.
G. Required Recycling, Salvage, and Reuse: The following may not be disposed of in landfills or by incineration:
    1. Aluminum and plastic containers.
    2. Corrugated cardboard and paper.
    3. Wood pallets.
    4. Clean dimensional wood.
    5. Bricks.
    6. Metals, including packaging banding, metal studs, sheet metal, structural steel, piping, reinforcing bars, door frames, and other items made of steel, iron, galvanized steel, stainless steel, aluminum, copper, zinc, lead, brass, and bronze.
    7. Glass.
    8. Gypsum drywall and plaster.
    9. Plastic buckets.
    10. Paint, solvents, cleaners, lubricants, adhesives and all other waste considered to be hazardous under State or Federal Regulations.
    11. Plastic sheeting.
    12. Rigid foam insulation.
    13. Windows.
    14. Batteries
H. Contractor shall submit Waste Disposal Reports along with every payment application; all landfill disposal, recycling, salvage, and reuse must be reported regardless of to whom the cost or savings accrues; use the same units of measure on all reports.
I. Methods of trash/waste disposal that are not acceptable are:
    1. Burning on the Project site.
    2. Burying on the Project site.
    3. Dumping or burying on other property, public or private.
    4. Other illegal dumping or burying.

J. Regulatory Requirements: Contractor is responsible for knowing and complying with regulatory requirements, including but not limited to Federal, State and local requirements.

1.2 RELATED REQUIREMENTS

A. Section 01 30 00 - Administrative Requirements 01 30 00: Additional requirements for Project meetings, reports, submittal procedures, and Project documentation.
B. Section 01 50 00 - Temporary Facilities and Controls: Additional requirements related to trash/waste collection and removal facilities and services.
C. Section 01 60 00 - Product Requirements: Waste prevention requirements related to delivery, storage, and handling.
D. Section 01 70 00 - Execution and Closeout Requirements: Trash/waste prevention procedures related to demolition, cutting and patching, installation, protection, and cleaning.

1.3 DEFINITIONS

A. Clean: Untreated and unpainted; not contaminated with oils, solvents, caulk, or the like.
B. Construction and Demolition Waste: Solid wastes typically including building materials, packaging, trash, debris, and rubble resulting from construction, remodeling, repair and demolition operations.
C. Hazardous: Exhibiting the characteristics of hazardous substances, i.e., ignitibility, corrosively, toxicity or reactivity.
D. Nonhazardous: Exhibiting none of the characteristics of hazardous substances, i.e., ignitibility, corrosively, toxicity, or reactivity.
E. Nontoxic: Neither immediately poisonous to humans nor poisonous after a long period of exposure.
F. Recyclable: The ability of a product or material to be recovered at the end of its life cycle and remanufactured into a new product for reuse by others.
G. Recycle: To remove a waste material from the Project site to another site for remanufacture into a new product for reuse by others.
H. Recycling: The process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for the purpose of using the altered form. Recycling does not include burning, incinerating, or thermally destroying waste.
I. Return: To give back reusable items or unused products to vendors for credit.
J. Reuse: To reuse a construction waste material in some manner on the Project site.
K. Salvage: To remove a waste material from the Project site to another site for resale or reuse by others.
L. Sediment: Soil and other debris that has been eroded and transported by storm or well production run-off water.
M. Source Separation: The act of keeping different types of waste materials separate beginning from the first time they become waste.
N. Toxic: Poisonous to humans either immediately or after a long period of exposure.
O. Trash: Any product or material unable to be reused, returned, recycled, or salvaged.
P. Waste: Extra material or material that has reached the end of its useful life in its intended use. Waste includes salvageable, returnable, recyclable, and reusable material.

1.4 SUBMITTALS

A. Submit Waste Management Plan after receipt of NTP (Notice to Proceed), or prior to any trash or waste removal, whichever occurs sooner; submit projection of all trash and waste that will require disposal and alternatives to landfilling.
B. Waste Disposal Reports: Submit at specified intervals, with details of quantities of trash and waste, means of disposal or reuse, and costs; show both totals to date and since last report.
    1. Submit updated Report with each Application for Progress Payment; failure to submit Report will delay payment.
    2. Submit Report on a form acceptable to County.
    3. Landfill Disposal: Include the following information:
        a. Identification of material.
        b. Amount, in tons or cubic yards (cubic meters), of trash/waste material from the Project disposed of in landfills.
        c. State the identity of landfills, total amount of tipping fees paid to landfill, and total disposal cost.
        d. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.
    2. Incinerator Disposal: Include the following information:
        a. Identification of material.
        b. Amount, in tons or cubic yards (cubic meters), of trash/waste material from the Project delivered to incinerators.
        c. State the identity of incinerators, total amount of fees paid to incinerator, and total disposal cost.
        d. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.
    3. Recycled and Salvaged Materials: Include the following information for each:
        a. Identification of material, including those retrieved by installer for use on other Projects.
        b. Amount, in tons or cubic yards (cubic meters), date removed from the Project site, and receiving party.
        c. Transportation cost, amount paid or received for the material, and the net total cost or savings of salvage or recycling each material.
        d. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.
        e. Certification by receiving party that materials will not be disposed of in landfills or by incineration.
    4. Material Reused on Project: Include the following information for each:
        a. Identification of material and how it was used in the Project.
        b. Amount, in tons or cubic yards (cubic meters).
        c. Include weight tickets as evidence of quantity.
    5. Other Disposal Methods: Include information similar to that described above, as appropriate to disposal method.

PART 2 PRODUCTS-NOT USED

PART 3 EXECUTION

3.1 WASTE MANAGEMENT PROCEDURES

A. See Section 01 50 00 for additional requirements related to trash/waste collection and removal facilities and services.
B. See Section 01 60 00 for waste prevention requirements related to delivery, storage, and handling.
C. See Section 01 70 00 for trash/waste prevention procedures related to cutting and patching, installation, protection, and cleaning.

3.2 WASTE MANAGEMENT PLAN IMPLEMENTATION

A. Manager: Designate an on-site person or persons responsible for instructing Workers and overseeing and documenting results of the Waste Management Plan.
B. Communication: Distribute copies of the Waste Management Plan to job site foreman, each Subcontractor, and Engineer.
C. Instruction: Provide on-site instruction of appropriate separation, handling, and recycling, salvage, reuse, and return methods to be used by all parties at the appropriate stages of the Project.
D. Meetings: Discuss trash/waste management goals and issues at project meetings.
    1. Pre-construction meeting.
    2. Regular job-site meetings.
E. Facilities: Provide specific facilities for separation and storage of materials for recycling, salvage, reuse, return, and trash disposal, for use by all Contractors and installers.
    1. As a minimum, provide:
        a. Separate area for storage of materials to be reused on-site, such as wood cut-offs for blocking.
        b. Separate dumpsters for each category of recyclable.
        c. Recycling bins at Worker lunch area.
    2. Provide containers as required.
    3. Provide temporary enclosures around piles of separated materials to be recycled or salvaged.
    4. Provide materials for barriers and enclosures that are nonhazardous, recyclable, or reusable to the maximum extent possible; reuse Project construction waste materials if possible.
    5. Locate enclosures out of the way of construction traffic.
    6. Provide adequate space for pick-up and delivery and convenience to Subcontractors.
    7. If an enclosed area is not provided, clearly lay out and label a specific area on-site.
    8. Keep recycling and trash/waste bin areas neat and clean and clearly marked in order to avoid contamination of materials.
F. Hazardous Wastes: Separate, store, and dispose of hazardous wastes according to applicable regulations.
G. Recycling: Separate, store, protect, and handle at the site identified recyclable waste products in order to prevent contamination of materials and to maximize recyclability of identified materials. Arrange for timely pickups from the site or deliveries to recycling facility in order to prevent contamination of recyclable materials.

H. Reuse of Materials On-Site: Set aside, sort, and protect separated products in preparation for reuse.
I. Salvage: Set aside, sort, and protect products to be salvaged for reuse off-site.

END OF SECTION

SECTION 01 78 00 - CLOSEOUT SUBMITTALS

PART 1 GENERAL

1.1 SECTION INCLUDES
A. Project Record Documents.
B. Operation and Maintenance Data.
C. Warranties.

1.2 RELATED REQUIREMENTS
A. General Conditions and Supplementary Conditions requirements.
B. Section 01 30 00 - Administrative Requirements: Submittals procedures, shop drawings, product data, and samples.
C. Individual Product Sections: Specific requirements for operation and maintenance data.
D. Individual Product Sections: Warranties required for specific products or Work.

1.3 SUBMITTALS
A. Project Record Documents: Submit documents to Engineer with Final Payment application. All documents will be in digital format noted below, except as otherwise noted.
B. Operation and Maintenance Data:
   1. For equipment, or component parts of equipment put into service during construction and operated by County, submit completed documents within ten calendar days after acceptance.
   2. Submit one copy of completed documents 15 calendar days prior to final inspection. This copy will be reviewed and returned after final inspection, with Engineer comments. Revise content of all document sets as required prior to final submission.
   3. Submit two sets of revised final documents in final form within 10 calendar days after final inspection.
C. Warranties and Bonds:
   1. For equipment or component parts of equipment put into service during construction with County's permission, submit documents within 10 calendar days after acceptance.
   2. Make other submittals within 10 calendar days after Date of Substantial Completion, prior to final Application for Payment.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.1 PROJECT RECORD DOCUMENTS
A. Maintain on site one set of the following record documents; record actual revisions to the Work:
   1. Drawings.
   2. Specifications.
   3. Addenda.

4. Change Orders and other modifications to the Contract.
5. Reviewed shop drawings, product data, and samples.
6. Inspection records.
7. Permits.

B. Ensure entries are complete and accurate, enabling future reference by County.
C. Store record documents separate from documents used for construction.
D. Record information concurrent with construction progress.
E. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
   1. Manufacturer's name and product model and number.
   2. Product substitutions or alternates utilized.
   3. Changes made by Addenda and modifications.
F. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction including:
   1. Measured depths of foundations in relation to finish first floor datum.
   2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
   3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
   4. Field changes of dimension and detail.
   5. Details not on original Contract drawings.
G. Provide two digital copies of all documents above (A through F) in high resolution PDF Format, with one digital copy on each USB thumb drive.

3.2 OPERATION AND MAINTENANCE DATA

A. Source Data: For each product or system, list names, addresses and telephone numbers of Sub-Contractors and suppliers, including local source of supplies and replacement parts.
B. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.
C. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawings.
D. Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.
E. Provide two digital copies of all documents above (A through D) in high resolution PDF digital format, with one digital copy on each USB thumb drive. Hard copies are not required.

1.3 OPERATION AND MAINTENANCE DATA FOR MATERIALS AND FINISHES

A. For Each Product, Applied Material, and Finish:
   1. Product data, with catalog number, size, composition, and color and texture designations.
B. Instructions for Care and Maintenance: Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental cleaning agents and methods, and recommended schedule for cleaning and maintenance.

C. Additional information as specified in individual product specification sections.
D. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.
E. Provide two digital copies of all documents above (A through D) in high resolution PDF digital format, with one digital copy on each USB thumb drive. Hard copies are not required.

1.4 ASSEMBLY OF OPERATION AND MAINTENANCE MANUALS

A. Assemble operation and maintenance data into high resolution PDF digital format for County's personnel use, with data arranged in the same sequence as, and identified by, the specification sections.
B. Where systems involve more than one specification section, provide separate digital tabbed divider for each system.
C. Cover: Identify each document with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of Project; identify subject matter of contents.
D. Project Directory: Title and address of Project; names, addresses, and telephone numbers of Engineer, Consultants, Contractor and subcontractors, with names of responsible parties.
E. Tables of Contents: List every item separated by a digital divider, using the same identification as on the divider tab; where multiple volumes are required, include all volumes Tables of Contents in each volume, with the current volume clearly identified.
F. Dividers: Provide digital tabbed subfolders for each separate product and system; identify the contents on the subfolder tab; immediately following the subfolder tab include a brief description of product and major component parts of equipment.
G. Text: Manufacturer's printed data, or typewritten data.
H. Drawings: Provide in high resolution PDF digital format.
I. Arrangement of Contents: Organize each volume in parts as follows:
    1. Project Directory.
    2. Table of Contents, of all volumes, and of this volume.
    3. Operation and Maintenance Data: Arranged by system, then by product category.
        a. Source data.
        b. Product data, shop drawings, and other submittals.
        c. Operation and maintenance data.
        d. Field quality control data.
        e. Photocopies of warranties and bonds.
J. Provide two digital copies of all documents above (A through I) in high resolution PDF Format, with one digital copy on each USB thumb drive. Hard copies are not required.

1.5 WARRANTIES

A. Refer to each specification section for specific warranty requirements.
B. Provide digital copies of warranties, executed in by responsible Subcontractors, suppliers, and manufacturers, within 10 calendar days after completion of the applicable item of

Work. Except for items put into use with County's permission, leave date of beginning of time of warranty until the date of Project Acceptance by the County.

C. Verify that documents are in proper format, contain full required information and terms, and are notarized.
D. Co-execute submittals when required.
E. Include in operation and maintenance manuals, indexed separately on Table of Contents.
F. Provide two digital copies of all documents above (A through E) in high resolution PDF Format, with one digital copy on each USB thumb drive. Hard copies are not required except where required by manufacturer in order to honor warranty.

END OF SECTION

SECTION 02 05 00 - DEMOLITION

PART 1 - GENERAL

1.01 SCOPE:

A. Remove portions of partitions, door, frames, windows, fixtures, equipment and materials, including but not limited to bolts, anchors, slabs and other existing miscellaneous and incidental work as indicated on Drawings and Schedules, and other items indicated on the Drawings, specified here, or as otherwise necessary to execute the work.

B. Remove demolished materials from site and disposal off-site.

C. Salvage and store for reuse all items specifically noted on the Drawings.

D. Demolish exterior items as indicated and as occur and as required to accommodate the new work, including concrete slabs, paving, walks, curbs, landscaping and Irrigation systems.

E. Protect existing construction and items to remain. Refer to Section 01 31 00 - Project Management and Coordination and Section 01 50 00 - Construction Facilities and Temporary Controls for additional requirements.

1.02 RELATED WORK DESCRIBED ELSEWHERE:

A. Cutting and Patching: Section 01 73 29

B. Mechanical: Refer to Mechanical Drawings.

C. Electrical: Refer to Electrical Drawings.

1.03 PROJECT/SITE CONDITIONS:

A. The Contractor shall assume complete responsibility for maintaining all necessary services to remaining portions of building not being remodeled.

B. Existing Utilities: Protect active utility lines that are to remain. Repair or replace any such utilities damaged by this Work at no additional cost to Owner.

C. Do not begin work of this Section until existing areas to remain have been properly prepared and supported.

1.04 SAFETY REQUIREMENTS AND STANDARDS:

Conform to local, state and federal codes, rules and regulations and ordinances for protection of workers, the public and property, and provide, install and maintain barricades, warning devices and other protection where required therefor.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

3.01 INSPECTION:

The Contractor shall inspect the existing areas to be demolished and notify the Architect of any problems in the Work.

3.02 PREPARATION:

A. Ensure safe passage of persons around area of demolition. Conduct operations to prevent injury to adjacent buildings, structures, other facilities, and persons. Erect temporary covered passageways as required.

B. Provide shoring, bracing, or support to prevent movement, settlement, or collapse of structures to be demolished, and adjacent facilities to remain.

3.03 DEMOLITION:

A. Proceed with demolition in a systematic manner, from top of structure to floor.

B. Saw cut, break up and remove concrete as indicated in conformance with Section 01 73 29 - Cutting and Patching.

C. Traffic: Perform demolition and clean up to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities.

D. Completely protect existing adjacent buildings and offsite buildings and property at all times from dust, dirt, moisture and demolition operations resulting from this work. Repair damage to satisfaction of the Architect and at no additional cost to the Owner.

F. Separation between work to be removed and work to remain shall present an even, straight line and smooth surface when portion to be demolished is removed.

G. Material removed during demolition may be reviewed by Owner, who may retain any materials with no change to the Contract amount or to the Contract Time. The Owner will remove from the site, at his own expense, any retained demolished

materials. Contractor shall legally dispose of remaining material.

H. Material identified for removal for reuse shall be carefully removed to prevent damage, and stored in a protected and secure location on site or at facilities provided by the Contractor until needed. Contractor shall remove, store and identify, as required for reinstallation, all fasteners, connectors, supports, backings, accessories, etc. associated with material identified for reuse.

J. No note or instruction in the contract documents shall be construed to imply that removal of materials containing or suspected of containing asbestos is part of this work; removal of asbestos containing materials will be performed by others and is not in the contract.

3.04 DEBRIS DISPOSAL:

A. Except as otherwise indicated or directed, debris resulting from work of this Section shall become this Contractor's property and shall be removed from site.

1. Location of disposal sites and length of hauls are Contractor's responsibility. On-site burning will not be permitted.

B. The Contractor may not use the Owner's trash bins or containers for disposal of demolished materials.

3.05 ADJUSTING AND CLEANING:

A. Clean up to leave the existing work in a condition ready to proceed with the remaining Work.

B. Remove from site debris, rubbish and other materials resulting from demolition operation and legally dispose of off site.

C. Promptly repair damages caused by this work to satisfaction of Architect at no additional cost to Owner.

END OF SECTION

SECTION 06 10 00 – ROUGH CARPENTRY

PART 1 - GENERAL

1.01 SCOPE

A. Provide all labor, materials, tools, facilities, and equipment required for the fabrication and installation of rough carpentry and associated items (except that which is specified elsewhere) indicated on Drawings and necessary to complete the Work. Items include, but are not necessarily limited to, the following:

1. Blocking, backing, stripping, furring, and nailers.

2. Rough hardware.

3. Preservative treatment.

1.02 RELATED WORK (See also Table of Contents)

A. Miscellaneous Metals: Section 05 50 00.

1.03 QUALITY ASSURANCE

A. General:

1. Coordinate the work of all trades to ensure proper placement of all materials, anchors, etc., as well as providing for openings and anchors for the installation of surface mounted materials and equipment.

2. Qualifications for Workmen: Provide sufficient skilled workmen and supervisors who shall be present at all times during execution of this portion of the work and who shall be thoroughly familiar with the type of construction involved and the materials and techniques specified.

3. Rejection: In the acceptance or rejection of rough carpentry, no allowance will be made for lack of skill on the part of the workmen.

B. Standards and References: (Latest Edition unless otherwise noted)

1. 2016 California Building Code (CBC)

2. Lumber: West Coast Lumber Inspection Bureau (WCLIB); Rule 17, Standard Grading Rules for West Coast Lumber.

3. Lumber: Western Wood Products Association (WWPA); Standard Grading Rules for Western Lumber.

4. Redwood: Redwood Inspection Service (RIS); Standard Specifications for Grades of California Redwood Lumber.

5. Wood Preservative: American Wood Preservative Bureau (AWPB):
   a. Standard for Softwood Lumber, Timber, and Plywood Pressure Treated with Volatile Petroleum Solvent (LPG) Penta Solution for Above Ground Use.

6. 1991 National Design Specification for Wood Construction (NDS).

C. Submittals: (Submit under provisions of Section 01 30 00)
   1. Certification:
      a. Preservative Treated Wood: Certification for waterborne preservative and that moisture content was reduced to 19% maximum, after treatment.

D. Tests and Inspections:

   1. If indicated on the structural drawings, load test expansion and epoxy anchors as indicated.

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Protection:

   1. After delivery, store all materials off the ground, covered, and in such a manner as to ensure proper ventilation and drainage and to protect against damage and the weather. Maintain wood at the maximum moisture levels indicated in Materials Section.

   2. Keep all material clearly identified with all grade marks legible; keep all damaged material clearly identified as damaged, and separately store to prevent its inadvertent use. Do not allow installation of damaged or otherwise non-complying material.

   3. Use all means necessary to protect the installed work and materials of all other trades.

   4. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the Architect and at no additional cost to the Owner

PART 2 - PRODUCTS

2.01 MATERIALS

A. Sawn Lumber:

1. Lumber (Wood Framing): Meet requirements of following minimum grades. All grades to WCLIB Grading Rules #17. Species shall be Douglas Fir - Larch

Item	Sizes	Grade	Maximum Moisture Content at Initial Use	Notes
Plates	2x	No. 2	19%	See "Wood Treatment"
Blocking & Nailers	2x	Construction	19%	

2. "At initial use" shall be that point at which nails, screws, bolts, split rings, shear plates or other fasteners or the holes for said fasteners are placed in the wood.

3. All sawn lumber is assumed to be enclosed in the dry building envelope in the final service condition, unless noted otherwise, and free to dry to moisture content less than 19%.

4. The Contractor shall use whatever means necessary, including site drying to ensure that the moisture contents above are not exceeded.

5. All studs, plates, joists, rafters, and beams shall be free of heart center in accordance with the specified grading standards.

B. Rough Hardware Fastenings and Connections: All types including bolts, lag screw, nails, spikes, screws, washers and other rough hardware, of kinds that may be purchased and that require no further fabrication, shall be furnished and installed for all finish and rough carpentry and shall conform to 1991 NDS Standards and dimensions. All exterior hardware shall be hot-dipped galvanized per ASTM A123 Standards.

1. Common wire nails or spikes unless noted otherwise on the drawings. Penetration of nails or spikes shall be one-half the length of the nail or spike into the piece receiving the point. However, to connect pieces 2" in thickness, 16d nails shall be

used unless noted otherwise. Bore holes for nails wherever necessary to prevent splitting. Use finish or casing nails for finish work, Nails for exterior wood trim shall be galvanized. Box nails and sinker nails are not permitted. Vinyl coating is permitted on common nails.

2. Bolts: Bolts shall conform to ASTM A307, grade A, Hex Head of sizes indicated. Holes shall be 1/16" larger than bolt diameter. Drive fit with washers under nuts. Malleable or plate washers shall be used where bolt heads or nuts bear on wood.

3. Lag bolts: Shall be screwed (not driven) into place. For the shank portion, holes shall be bored the same depth and diameter as shank. For threaded portion, holes shall be between 60% to 75% of the shank diameter. Tighten all bolts and screws before closing in. Use galvanized bolts wherever indicated. All bolt and lag bolt heads to be hex head where exposed. Bolts shall conform to ASTM A307, Grade A, Hexagonal heads, unless noted otherwise.

4. Washers: Washers for bearing against wood shall be provided under all bolt heads and nuts. Steel washers shall have a thickness not less than 1/10 the length of the washer's longest side. Malleable iron washers shall have a bearing surface for the nut or head equal in diameter to not less than the long diameter of the nut or head.

5. Powder Driven Fasteners: Tempered steel pins with special corrosive resistant plating or coating. Pins shall have guide washers to accurately control penetration. Fastening shall be accomplished by low-velocity piston-driven power activated tool. Pins and tool shall be as manufactured by Hilti Fastening Systems. See Drawings for size, type and embedment.

6. Expansion Bolts: Hilti Fastening Systems "Kwik-Bolt Concrete Expansion Anchors" to concrete; Ramset "Dynabolt Sleeve Anchors" to masonry or approved equal.

2.02 FABRICATION

A. Lumber:

1. All lumber shall be air or kiln-dried to the maximum moisture content indicated in Materials Section.

2. Furnish S4S unless otherwise noted.

3. Size to conform with rules of governing standard. Sizes shown are nominal unless otherwise noted.

B. Wood Treatment:

1. Preservative Treatment: The treating process and results thereof shall meet AWPA Standards as indicated in CBC Section 2304A.3.

2. After treatment and prior to shipping, air or kiln-dry lumber to maximum 19 percent moisture content.

3. All treated wood shall bear the manufacturer's preservative treated trademark.

4. The amount of preservative to be injected into the wood shall be as recommended by the manufacturer for each type of installation.

5. All wood in contact with concrete or masonry shall be preservative treated.

6. Apply two coats of same preservative used in original treatment to cut surfaces and bored holes.

C. Fire Treatment: All wood shall be identified with a UL Label certifying the required classification. The treating process and results thereof shall meet UBC Standard 23-5 as applicable in all above ground weather protected locations. Treater shall submit design and fastener valves for treated wood to Structural Engineer for review. See CBC Section 2304. See Drawings for location of fire treated wood.

2.03 SOURCE QUALITY CONTROL

A. Grade Mark each piece of lumber. Marking must be done by recognized agency.

1. Douglas Fir shall bear WCLIB grade stamp.

2. Pressure treated Douglas Fir shall bear AWPA Quality mark. Cuts and holes shall be pre-treated.

PART 3 - EXECUTION

3.01 SURFACE CONDITIONS

A. Inspection:

1. Prior to all work of this Section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly proceed.

2. Verify that rough carpentry may be performed in strict accordance with the original design and all pertinent codes and regulations.

B. Discrepancies: In the event of discrepancy, immediately notify Architect. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.

3.02 WORKMANSHIP

A. General: All rough carpentry shall produce joints true, tight, and well nailed with all members assembled in accordance with the Drawings and with all pertinent codes and regulations.

B. Selection of Lumber Pieces: Carefully select all members. Select individual pieces so that knots and obvious defects will not interfere with placing bolts or proper nailing or making proper connections. Cut out and discard all defects which will render a piece unable to serve its intended function.

C. Lumber may be rejected by the Architect, whether or not it has been installed, for excessive warp, twist, bow, crook, mildew, fungus, or mold, as well as for improper cutting and fitting.

D. Shimming: do not shim any framing component.

E. Notching and boring of members is in strict conformance with the Drawings and that there are no overcuts.

3.03 FASTENING

A. Nailing: Except as otherwise indicated on Drawings or specified, all nailing shall be as required by CBC 2304

1. Nails or Spikes shall be common wire unless noted otherwise. Penetration of nails or spikes shall be one-half the length of the nail or spike into the piece receiving the point. However, to connect pieces 2" in thickness, 16d nails shall be used unless noted otherwise.
   a. Bore holes for nails wherever necessary to prevent splitting.
   b. Use finish or casing for finish work.
   c. Use of nailing guns must be approved by Structural Engineer. Submittal of guns and nails is required. Nails installed with nail guns shall not penetrate into the outer plies deeper than hand nailing.

B. Bolts: Bolts shall be sizes indicated. Holes for bolts shall be 1/16" larger than the bolt. Drive fit with washers under nuts. Malleable or plate washers shall be used. Cut

washers are not permitted. Lag screws shall be screwed (not driven) into place for the shank, holes shall be bored the same depth and diameter as shank. For threaded portion, holes shall be between 60% and 75% of the shank diameter. Tighten all bolts and screws before closing in.

C. Framing Devices: As specified under Products, sizes as indicated. Use half-length nails where required.

3.04 MISCELLANEOUS HARDWARE

A. All other hardware indicated or required but not specified elsewhere shall be furnished and installed hereunder, including appropriate screws or other fastening devices.

3.05 MISCELLANEOUS CARPENTRY WORK

A. Miscellaneous Carpentry Work not included under other sections shall be indicated or required but not specified elsewhere shall be furnished and installed hereunder, including appropriate screws or other fastening devices. Contractor shall provide miscellaneous carpentry work for all sections and divisions of work identified.

B. Miscellaneous Carpentry Work not included under other sections shall be furnished and installed hereunder as indicated. Carefully locate and securely anchor items furnished by other trades or under other sections of these specifications to the structure or structural framing.

C. Shoring and Bracing: Shore or brace for temporary support of all work as required during the construction period except any shoring and bracing specified and included under other sections of these specifications.

D. Temporary Enclosures: Provide and maintain all barricades and enclosures required to protect the work in progress.

E. Protect all work in progress and all work installed, as well as the work of all other trades. Any work damaged as a result of the work under this section shall be corrected to its original condition or replaced if directed by the Architect at no increase in cost to the Owner.

3.06 MISCELLANEOUS WORK

A. All miscellaneous work and materials not otherwise specified or included under other sections of these specifications shall be furnished and installed hereunder.

B. Install all items under other sections specified to be furnished and installed in other sections which relate to the rough carpentry work.

END OF SECTION

SECTION 06 30 00 - FINISH CARPENTRY

PART 1 - GENERAL

1.01 WORK INCLUDED

Provide complete finish carpentry and millwork as indicated on the Drawings and specified herein.

1.02 RELATED WORK

A. Section 06 10 00: Rough Carpentry.

B. Section 06 40 00: Architectural Casework.

C. Section 08 21 00: Wood Doors

C. Section 09 90 00: Painting.

1.03 SUBMITTALS

A. Refer to Section 01 30 00.

B. Shop drawings: Submit shop drawings showing details of all millwork and mill instructions for all work being prepared by mill.

C. List of materials: Submit list of all materials proposed to be used including fasteners, sealants, and adhesives.

D. Samples: Submit for approval when specifically requested.

1.04 JOB MEASUREMENTS

Take as necessary for proper fitting. Report discrepancies between Drawings and field dimensions to the Architect before fabrication.

1.05 DELIVERY

Do not deliver millwork to job until building is in proper condition and arrangements have been made to properly handle, store and protect such work.

1.06 STANDARDS

Manufacture millwork in accordance with standards (latest revision) of Woodwork Institute,

(Latest) Edition, Manual of Millwork (WI) in Grade or Grades hereinafter specified except as modified on Drawings.

1.07 MOISTURE CONTENT OF MILLWORK

Between 6 and 12 percent, consistent with average atmospheric conditions at project location.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Interior trim and Base: WI, Section 4, Birch unless otherwise noted, Custom Grade, transparent finish. Grades and species as recommended in WI where not indicated.

B. Solid plastic adhesive and sealant: Use only adhesives and sealant as recommended by manufacturer for proposed application.

C. Caulking: Vulcatex, Kaukit, or approved equal, gun grade.

D. Fasteners:

1. Nails: Hot-dipped galvanized for all exterior work. Bright finish finishing nails for all interior work.

2. Bolts: Machine bolts, unless noted otherwise.

PART 3 - EXECUTION

3.01 MILLING

A. Mill to dimensions and profiles shown. Except where exact length can be determined, material shall be provided long for cutting and fitting in field.

B. "Back out" reverse side of trim when 5/8 inch or more thick or 1-5/8 inches or more wide.

3.02 INSTALLATION

A. Do not install millwork until wet operations are completed and concrete, work has thoroughly dried out, and millwork has been primed or sealed under "Painting Work". Reseal cut edges, surfaces, and ends in approved manner.

B. Trim members: Install level, plumb and true, with members neatly and accurately

scribed in place. Install standing trim in single lengths, running trim in as long lengths as practicable for species specified. Butt joints beveled together; exterior angles coped. All wood trim shall be back primed prior to installation per Section 09900.

C. Workmanship: Exposed surfaces of finish carpentry shall be free from tool marks, torn grain, cross sanding, or any workmanship defects that cannot be concealed by specified painter's finish.

END OF SECTION

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 06 40 00 – ARCHITECTURAL CASEWORK

PART 1 - GENERAL

1.01 SCOPE

A. Furnish and install all architectural woodwork, architectural casework, laminated plastic counters, hardware, and accessories as indicated on the Drawings and specified here.

1.02 RELATED WORK

A. Backing and Blocking: 06 10 00.

B. Finish Carpentry: Section 06 20 00.

C. Sheet Metal: Section 07 60 00.

D. Finish Hardware, except as specified here: Section 08 71 00.

E. Resilient Flooring and Base: Section 09 65 00

F. Paint (Opaque Finishes): Section 09 90 00.

G. Outlets and fittings built into architectural casework: Refer to Electrical Drawings.

1.03 QUALITY ASSURANCE

A. Comply with "Manual of Millwork" of the Woodwork Institute, (Latest) Edition, for the grades, types and styles specified.

B. Qualifications of fabricators and installers:

1. For actual fabrication and installation of architectural woodwork, use only personnel who are thoroughly trained and experienced in the products involved and in the recommended methods for their fabrication and installation.

2. In the acceptance or rejection of architectural woodwork, no allowance will be made for lack of skill on the part of the workmen.

1.04 SUBMITTALS

A. Comply with the provisions of Section 01 30 00 for submitting:

1. Complete materials list of all items proposed to be furnished and installed under this Section. Submittal required.

2. Product data, including full range of color samples. Submittal required.

3. Shop Drawings showing each item provided under this Section, completely detailing joinery, and other construction, including anchorage, and displaying the "Certificate of Compliance" of the Woodwork Institute for the grades specified. Submittal required.

4. Sufficient other data to demonstrate compliance with the specified requirements. Submit upon Architect's request only.

B. The approved manufacturer's recommended installation procedures will become the basis for inspecting and accepting or rejecting actual installation procedures used on the Work.

1.05 DELIVERY, STORAGE AND HANDLING

A. Do not deliver casework to job until notified by the General Contractor that buildings are enclosed, and suitable storage space is available.

B. Deliver undamaged products to site in manufacturer's sealed containers or wrappings with legends intact. Store on site secure from weather, soil and physical damage.

1.06 PROJECT CONDITIONS

A. Products shall be available at project when required for installation so as not to delay job progress. Installer for these products shall cooperate with installers performing work under other sections involved to effect proper installation.

B. Casework fabricator shall coordinate installation of any Owner supplied equipment when indicated on the Drawings.

PART 2 - PRODUCTS

2.01 HIGH PRESSURE LAMINATE COVERED CASEWORK

A. High Pressure Plastic Laminate Covered Casework shall be constructed in accordance with W.I.A. Section 15 and Supplemental No. 2 for the following requirements:

1. Construction Type II; Single length units to fit access openings.

2. Construction: Style A; Frameless.

3. Door and Drawer Construction: Not used.

4. Grade: Custom.

5. Exposed surfaces shall be covered in .028-inch (.71mm) thick high pressure laminated plastic in accordance with NEMA LD 3-1985, Type GP50. ,Nevamar, Formica, or approved equal. Matt finish.

6. Semi-exposed surfaces low pressure melamine in accordance with ALA-85.

7. Concealed surfaces shall be in accordance with grade standard unless otherwise indicated.

8. Edge Banding: All drawer and door edge banding shall be .028-inch (.71mm) thick high pressure laminated plastic to match color and texture of exposed surfaces.

9. Semi-exposed edges shall be banded with plastic "T" molding. Color as selected by Architect.

10. Colors shall be as selected by Architect from manufacturers full range of colors or as scheduled on the Drawings.

11. Semi-exposed cabinet backs shall be colorsealed tempered hardboard.

13. Countertop Type as indicated on the Drawings.

2.02 MISCELLANEOUS CASEWORK AND ARCHITECTURAL WOODWORK ITEMS

All miscellaneous casework and architectural woodwork items not specifically identified as to "Type" shall be constructed as indicated on the Drawings and shall meet WIC Custom Grade, Type I, Style A construction standards as specified in this Section.

2.03 COUNTERTOPS

A. General purpose grade plastic laminated covered countertops shall be constructed to requirements of WI Premium Grade.

1. Edges to be self-edged with same material as used on counter surface.

2. Splashes to be 4 inch (10cm) integral square butt joint splash with matching end splash unless otherwise indicated.

3. Laminated plastic to be 0.050-inch (1.3mm) thick for horizontal surfaces in accordance with NEMA LD 3-80, Type GP50 and FR50 at rated locations. Nevamar, Formica Corp., or approved equal. Matt Finish.

4. Core Material: Close-grained hardwood plywood with "Sound" (2) Grade Face Veneer and Crossband Veneer under the face veneer of Industrial (3) Grade or better, in accordance with W.I.C. standards, but in no case less than 3/4-inch (1.9cm) thick or with deflection greater than 3/16-inch (4.8mm) with 150-pound (68kg) load at midspan.

5. Color shall be as selected by Architect from manufacturer's full range of colors as scheduled.

6. Nosings shall be squared self-edged, custom.

2.05 ACCESSORY AND MISCELLANEOUS MATERIALS

A. Provide all accessories and materials as required for finish architectural casework.

B. Fasteners: Provide screws and adhesives in accordance with specified standards and as required. Staples and nails shall not be used for caseworkjoinery.

C. Bases and sleepers shall be in accordance with the referenced Standards and as indicated on the Drawings.

2.06 HARDWARE

A. Hardware shall be furnished and installed as required to provide a complete casework installation.

B. Hardware shall be US-26D finish unless specified otherwise.

C. The following hardware is listed to establish a quality of product. Choice of manufacturer and type or use of substitutions of equal quality products may be made at the option of the cabinet manufacturer but shall be subject to the approval of the Architect whose decision will be final.

1. Hinges: Not used.

2. Door and Drawer Pulls: Not used.

3. Magnetic Catches: Not used.

4. Elbow Catches: Not used.

6. Drawer Slides: Not used.

7. Adjustable Shelf Standards: Not used.

8. Adjustable Shelf Clips: KV 244, equivalent by Grant, Stanley CD1800, or approved equal with retention pins.

9. Cord Sleeve/Grommet: Plastic cord sleeve equal to product as manufactured by D. Mocket & Co., Inc. (213) 318-2441. Size and locations as indicated on the Drawings and or as directed by the Architect. Minimum at 4'-0" o.c. Color as selected by the Architect.

10. Provide additional hardware items as required for the complete and proper installation and operation of Architectural Casework and Woodwork items as indicated on the Drawings and as recommended by WI Supplemental No. 1 for Finish Hardware.

2.07 FABRICATION

A. Casework shall be flush overlay construction, unless otherwise indicated.

B. Shop fabricate items and deliver to job in largest unit sections as possible and in accordance with WI Construction Types specified. Where field joining is required, accurately fit and align in shop and make all provisions for rigid and permanent joining in field. Allow sufficient material to permit accurate scribing to adjacent walls and related work in accordance with the referenced Standards and as shown on the Drawings.

C. Make cutouts required for equipment and accessories mounted in or on casework items.

PART 3 - EXECUTION

3.01 INSPECTION

A. Prior to all work of this Section, carefully inspect, and verify that the installed work of all other trades is complete to the point where this work may properly commence.

B. Verify that specified items may be installed in accordance with the approved design.

C. In the event of discrepancy, immediately notify the Contractor. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.02 PREPARATION

A. Take all necessary measurements in the field to ensure proper dimensions for cabinets and countertops.

B. Coordinate work under this Section with other trades whose work adjoins, combines, or aligns with same.

3.03 INSTALLATION

A. Ensure that in-wall backing is properly located before wall finish is installed. Set casework in place, square, level, straight and plumb. Scribe and accurately fit to adjacent work. Secure to structure in position indicated with required fastenings, clip angles, bases, anchors, nailing, blocking, shimming and other fittings.

B. Provide closures and fillers, and scribe strips required to provide a neat and finished installation. All such exposed items shall match casework as needed.

C. Furnish miscellaneous metal support and bracing required for installation. Deliver these items to trades responsible for adjacent work and designate exact location for their installation.

1. Minimum horizontal anchorage along top and bottom edges of wall mounted and floor mounted casework shall be #12 x length to suit (minimum 2-1/2" (6.4cm)) sheet metal screws (plated) with finish washers at 12" (30cm) o.c. and 3" (10cm) from each end into solid backing or metal backing plate. Minimum three (3) fasteners each along top and bottom edges.

3.04 FIELD QUALITY CONTROL

Compliance: The Owner reserves the right to request an inspection by a representative of the Woodwork Institute at any time during the work of this Section to verify that all work of this Section has been performed in accordance with the referenced standards at any time during the work of this Section.

3.05 ADJUSTING AND CLEANING

A. Prior to final inspection and acceptance by the Architect, completely check each installed item and adjust for proper operation.

B. Remove all fingerprints, smudges, and the like from casework, vacuum clean drawers and interiors of dust, dirt and sawdust.

3.06 PROTECTION

A. Protect work and materials of this Section prior to and during installation and protect the installed work and materials of other trades.

B. In the event of damage, make all repairs and replacements necessary to the approval of the Architect at no additional cost to the Owner.

-END OF SECTION-

SECTION 07 21 00 – THERMAL AND ACCOUSTICAL INSULATION

PART 1 - GENERAL

1.01 SCOPE

A. Building insulation required for this work includes, but is not necessarily limited to:

1. Sound Insulation.

2. Thermal Insulation.

3. Drainpipe Insulation Wrap.

1.02 RELATED WORK

A. Section 07 25 50: Fire Safety Insulation.

B. Duct and pipe insulation as noted on the Drawings.

1.02 QUALITY ASSURANCE

Insulation shall meet minimum requirements set forth in California Code of Regulations, Title 24, Section 2-5311 "Installation of Certified Insulating Material" and CBC Section 707.

1.03 SUBMITTALS

A. Refer to Section 01 30 00.

B. Manufacturer's data: Submit data indicating types of materials proposed for use, and their locations.

C. Certification: Provide manufacturer's certification or identification on insulation that materials meet specified requirements.

1.04 PRODUCT DELIVER, STORAGE AND HANDLING

Deliver insulation to site in original, unbroken, and unopened containers. Store material off ground in dry, protected areas.

PART 2 - PRODUCTS

2.01 PRODUCT STANDARDS

A. Thermal resistance value (R): Thermal resistance calculated on value of material

itself, without regard to location or method of installation.

1. Match existing in areas of adjacent work.

2.02 MATERIALS

A. Thermal insulation: FS HH-I-521, mineral fiber batts or blankets, made from rock, slag or glass processed from molten state into fibrous form, membrane covered, in self supporting batt or blanket form, with integral vapor barrier on under or inside face and vapor permeance of not more than 1 perm when tested in accordance with ASTM E96.

1. Insulation to conform with CBC Section 707.3: All insulation materials including facings, such as vapor barriers or breather papers installed within roof-ceiling assemblies, walls, shall have a flame-spread rating not to exceed 25 and a smoke density not to exceed 450 when tested in accordance with U.B.C. Standard No. 8 -1.

2. Foil faced materials at exposed or rated applications.

3. Provide at all new infilled exterior wall openings.

B. Acoustical insulation: FS HH-1-521E Type 1, mineral fiber batts or blankets, full thickness in stud walls typical at all new interior walls, unless noted otherwise. USG "Sound Attenuation Blankets" or approved equal.

2.04 DRAINPIPE INSULATION WRAP

A. Drainpipe insulation wrap: Exposed drain and hot water supply plumbing lines under sinks and vanities shall be wrapped with an approved insulation wrap, shaped and formed to a neat and uniform appearance with tapered ends. Insulation shall be wrapped with a white washable vinyl tape as approved by the Architect.

1. Insulation wrap systems equal to TrueBro Handi Lav-Guard, Plumberex Handy-Shield, or approved equal pipe wraps systems are also acceptable.

2.05 MISCELLANEOUS MATERIALS

A. All other materials, such as additional insulation materials, fasteners, line wire, tape and retainers, not specifically described but required for a complete and proper installation of building insulation, shall be as selected by the Contractor subject to submittal approvals.

1. Additional insulation materials shall be selected from manufacturer's standard materials and shall conform to the specified Codes, Standards and

performance requirements as indicated on the Drawings or as required for the complete and proper construction of the building envelope.

PART 3 - EXECUTION

3.01 LOCATIONS

A. Provide mineral fiber batts at exterior stud walls and ceiling spaces where existing insulation envelope is affected by new work to create a complete thermal around inhabited space.

B. Provide acoustical insulation at all interior walls unless otherwise noted.

3.02 INSTALLATION OF THERMAL INSULATION

A. Metal Studs: Install friction fit thermal insulation batts or blankets with snug fit at sides and firmly butted ends with no open space at perimeter or in between. Lap and adhere flanges of vapor barrier in such manner that air leaks between insulation and joints are minimized.

B. Metal Ceiling Joists: Install friction fit thermal insulation in same manner specified for Metal studs.

C. Batt, Blanket Insulation: Provide insulation barrier system with no voids in system. Keep end joints to a minimum. Install with vapor barrier to warm side. Fit ends and edges tight to framing members. Keep all piping and other work on warm side of insulation. Provide tape vapor barrier joints. Tape as required.

3.03 INSTALLATION OF ACOUSTICAL INSULATION

A. Metal studs or joists: Install with friction fit between studs or joists in accord with manufacturer's recommendations, filling all voids.

B. Existing Wood studs or joists: Install with friction fit between studs or joists in accord with manufacturer's recommendations, filling all voids.

END OF SECTION

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 07 25 50 – FIRE SAFING MATERIALS

PART 1 - GENERAL

1.01 SCOPE

A. Provide fire safing and firestopping systems and smoke seals as indicated on the Drawings as well as the following areas, including:

1. All openings in fire-rated ceilings and walls both empty and those accommodating penetrating items such as cables, conduits, pipes, ducts, etc.

1.02 RELATED WORK.

A. Electrical: As noted on the Drawings.

1.03 QUALITY ASSURANCE

A. The approved manufacturer's recommended installation procedures will become the basis for inspecting and accepting or rejecting actual installation procedures used on the work.

B. Catalog Standards:

1. Manufacturer's catalog numbers may be shown on Drawings or convenience in identifying specific items. Unless modified by notation on Drawings or specified, catalog description for indicated number constitutes requirements for the item specified.

2. The use of catalog numbers and specific requirements set forth in Drawing and Specifications does not preclude use of any other manufacturer's products or procedures, which may be equivalent. Such numbers and requirements establish standards of design and quality for materials, construction, and workmanship.

C. Fire safing and firestopping materials shall conform to both Flame (F) and Temperature (T) ratings as tested by nationally accepted test agencies per ASTM E-814 or UL 1479 and E-119 fire tests. The F rating and T rating must be a minimum of one (1) hour, but not less than the fire resistance rating of the assembly being penetrated. The fire resistance rating of the assembly being penetrated. The fire test shall be conducted with a minimum positive pressure differential of 0.03 inches of water column.

D. Fire safing and fire stopping systems shall be performed by a Contractor trained or

approved by system manufacturer. Equipment used shall be in accordance with system manufacturer's written installation instructions.

1.04 SUBMITTALS

A. Refer to section 01 30 00 for submitting the following:

1. Submit manufacturer's printed product data indicating product characteristics, performance and limiting criteria. Submittal required.

2. Submit manufacturer's installation instructions for each type of firestop required by the project. Submittal required.

1.05 DELIVERY, STORAGE AND HANDLING

A. Deliver undamaged products to site in manufacturer's sealed containers or wrappings with legends and UL label intact. Store on site secure from weather, soil and physical damage.

B. Store in strict accordance with the manufacturer's recommendations.

1.06 PROJECT CONDITIONS

A. Products shall be available at project when required for installation so as not to delay job progress. Installer for these products shall cooperate with installers performing work under other sections involved to effect proper installation.

B. Conform to manufacturer's printed instructions for installation and when applicable, curing in accordance with temperature and humidity. Conform to ventilation and safety requirements.

PART 2 - PRODUCTS

2.01 FIRE SAFING SYSTEM

A. Fire safing systems shall be "Thermafiber life-safety insulation systems: as manufactured by United States Gypsum, FBX System as manufactured by Fibres, or approved equal.

B. Thickness, assemblies, and widths as required to achieve ratings as indicated.

C. Systems shall be in accordance with ratings requirements for ASTM E-119 and E-814.

D. Provide fasteners, retainers, clips, brackets, adhesives, sealants, or other system accessories as required by manufacturer for complete and proper installation.

2.02 FIRESTOPPING SYSTEMS

A. Acceptable manufacturers:

1. Bio Fireshield, Inc.

2. Dow Corning Corp.

3. Electrical Products Division, 3M Center.

4. Hilti Construction Chemicals, Inc.

B. Materials:

1. Materials shall be free of asbestos.

2. Materials shall provide a Flame (F) and Temperature (t) rating of at least one (1) hour, but not less than the fire resistance rating of assembly being penetrated, as tested per ASTM E-814.

3. Materials shall conform to all applicable governing codes.

4. Firestop Mortar: Single component Portland Cement fly ash mortar. Required no supports or anchoring devices to pass water hose stream tests. UL classified for both Flame (F) and Temperature (T) ratings. Firestop mortar shall restrict the transmission of temperature as well as the passage of flame, smoke, and water.

5. Firestop Sealant: Single or multiple component silicone sealant. Provides a flexible, air-tight, waterproof seal that bonds to most building materials. UL classified for both flame (F) and Temperature (T) ratings. Firestop sealant shall restrict the transmission of temperature as well as the passage of flame, smoke, and water.

6. Firestop Sleeve: Prefabricated device used around plastic pipes in fire-rated floors and walls. The sleeve is made up of a steel collar lined with an intumescent material. UL classified for both Flame (F) and Temperature (T).

7. Intumescent Mastic Sealant: Single component, water-based intumescent. Classified for both Flame (F) and Temperature (T) ratings under ASTM E-814-83.

2.03 MISCELLANEOUS ITEMS

Provide all miscellaneous fasteners, clips, retainers, brackets, supports, connectors and accessory items as indicated on the Drawings or as required by the product manufacturer for a complete and proper installation of the materials, products or systems specified in this section.

PART 3 - EXECUTION

3.01 INSPECTION

A. Prior to installation of the work of this section, carefully inspect and verify that the installed work of all other trades is complete to the pint where this installation may properly commence.

B. Verify that specified items may be installed in accordance with the approved design.

C. In the event of discrepancy, immediately notify Contractor. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.02 PREPARATION

A. Clean surfaces and substrates of dirt, oil, loose materials and other foreign materials which may affect the proper bond or installation of the firestops in strict accordance with manufacturers written instructions.

B. Provide primers as required which conform to manufacturers recommendations for various substrates and conditions.

C. Do not apply fire safing and fire stops to surfaces previously painted or treated with a sealer, curing compound, water repellent or other coatings unless tests have been performed to ensure compatibility of materials. Remove coatings as required in compliance with manufacturers instructions.

D. Mask where necessary to protect adjoining surfaces. Remove excess material and stains on surfaces as required.

3.03 INSTALLATION

A. Install in strict accordance with manufacturers printed instructions to provide a Flame (F) and Temperature (T) rating of at least one hour, but not less than the fire resistance rating of the assembly being penetrated.

B. Ensure that anchoring devices back-up materials, clips, sleeves, supports, and other materials used in the actual fire tests are installed.

C. Install fire safings and firestops with sufficient pressure to properly fill and seal openings to ensure and effective smokeseal.

D. Tool or trowel exposed surfaces. Remove excess firestop or fire safing material promptly as work progresses and upon completion.

3.04 FIELD QUALITY CONTROL

A. Contractor shall immediately notify the Architect if the firestopping systems herein specified cannot meet the requirements of the specification.

B. Contractor shall examine firestops to ensure proper installation and full compliance Code authorities.

D. Correct unacceptable fire safing assemblies and firestops and provide addition inspection to verify compliance with this specification at no additional cost.

E. When finished, work will be visible. Clean adjacent surfaces in accordance with manufacturer's printed instructions.

F. If visible in the finished work, remove temporary dams after initial cure of firestops.

G. Correct staining and discoloring on adjacent surfaces.

H. Remove all debris and excess materials entirely from site and leave work in a neat and tidy condition.

3.05 PROTECTION

A. Protect work and materials of this Section prior to and during installation and protect the installed work and materials of other trades.

B. In the event of damage, make all repairs and replacements necessary to the approval of the Architect at no additional cost to the Owner.

-END OF SECTION-

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 07 92 00 – SEALANTS AND CAULKINGS

PART 1 - GENERAL

1.01 SCOPE

Provide all caulking and sealants for all interior and exterior joints as indicated on the Drawings and specified here or as otherwise required for and as required to accommodate new work or make a weather-tight building envelope.

1.02 RELATED WORK

A. Section 07 60 00: Sheet Metal Work

`

B. Section 09 25 00: Gypsum Wallboard

1.03 QUALITY ASSURANCE

A. Except as otherwise indicated, joint sealers are required to establish and maintain airtight and waterproof continuous seals on a permanent basis, within recognized limitations of wear and aging, as indicated for each application.

B. Failure of installed sealers to comply with this requirement will be recognized as failures of materials and workmanship.

C. Manufacturer's Representative: Arrange for technical representative to be on project site to advise installer of proper procedures and precautions for use of materials, and to check installation.

1.04 SUBMITTALS

A. Refer to Section 01 30 00 for submitting the following items:

1. Samples: Submit color charts for selection by Architect. Submittal required.

2. Product data and installation instructions for sealant, backing, and related materials. Submittal required.

B. Certification: Manufacturer's published data, letter of certification, or certified test laboratory report that materials are chemically compatible with each other and with substrate, comply with Specification requirements, and are intended for applications indicated. Submittal required.

1.05 DELIVERY, STORAGE AND HANDLING

A. Deliver caulking and sealing compounds to the job in unbroken, sealed containers bearing the manufacturer's mixing directions. Store materials in sealed containers in a dry protected area above the ground or floor.

B. Protect caulking materials before, during and after installation, and installed work of other trades during installation.

C. Do not use caulking materials that have been stored for a period exceeding the maximum recommended shelf life.

1.06 JOB CONDITIONS

A. Do not proceed with installation of sealant if joint width is less than designed, unless written notification is submitted to Contractor and a written order to proceed is provided by the Contractor.

B. Do not proceed with the installation of sealants under conditions when joint to be sealed is damp, wet or frozen, or when temperatures are below or above the manufacturer's recommended limitations for installation. Consult the manufacturer for specific instructions before proceeding.

1.07 WARRANTY

A. Installer warrants workmanship for a period of two (2) years in accordance with the terms of the Contractor's written warranty. Materials are warranted in accordance with the manufacturer's written warranty.

B. Submit in accordance with Section 01 78 00.

PART 2 - PRODUCTS

2.01 PRODUCT DESCRIPTION

A. General: All sealants, caulking compounds, primers, etc. shall be non-staining to adjacent exposed materials. Areas having similar application shall be of the same manufacturer's standard matching colors.

B. Sealants and caulking compounds used on this project shall be compatible with the substrate and with other sealing materials where intersections occur.

2.02 MATERIALS

A. Polysulfide (Type 1):

1. Two-part conforming to Fed Spec TT-S-00227E, Class A, Type 1 (self leveling) or Type 2 (non sag) as recommended by manufacturer for application.

2. Acceptable products:

   a. Synthacalk GC-5, from Pecora Corp.

   b. Sonolastic, from Sonneborn-Contech, Inc.

   c. RC-350, from PRC.

B. Modified Polyurethane (Type 2):

1. Two or three-part conforming to Fed Spec TT-S-000227E, Class A, Type II.

2. Acceptable products:

   a. Dymeric, from Tremco.

   b. Dynatrol II, from Pecora.

   c. NP2, from Sonneborn-Contech, Inc.

   d. RC-2, RC-270, from PRC.

C. Polyurethane (Type 3):

1. Two-part conforming to Fed Spec TT-S-000227E, Class A, Type 1 or II.

2. Acceptable Products:

   a. NR-200, from Pecora.

   b. RC-270, from PRC.

   c. Sonolastic Paving Joint Sealant, from Sonneborn-Contech.

   d. THC-900/901, from Tremco.

D. Acrylic, Solvent Cure (Type 4):

1. One part, Fed Spec TT-S-00230.

2. Acceptable products:

a. Mono, from Tremco.

b. Unicrylic, from Pecora.

c. Permacryl, from Schnee-Morehead Chemicals, Inc.

E. Nondrying, Nonskinning (Type 5):

1. One-part sealing compound.

2. Acceptable products:

a. Curtain Wall Sealant, from Tremco.

b. BR-06, from Pecora.

c. GC-55 Noncuring, from Goal Chemical.

F. Foam Sealant (Type 6):

1. Two-part foamed silicone elastomer.

2. Acceptable Product:

a. 3-6548 Silicone RTV Foam, from Dow-Corning.

b. PR-850, from PRC.

G. Acoustical Sealant (Type 7):

1. One-part non-sag, acrylic latex polymer.

2. Acceptable products:

a. AC-20, from Pecora.

b. 834 from Tremco.

c. USG.

2.03 ACCESSORIES

A. Sealant Primer: Suitable to substrate surfaces as recommended by the sealant manufacturer. Knowledge of whether the primer is staining, or non-staining should

be obtained prior to application.

B. Joint Backing: Preformed compressible, resilient, non-waxing, non-extruding, non-staining strips (polyethylene foam, urethane foam, or butyl) as recommended by the sealant manufacturer. Backing shall be of sizes and shapes to suit the various conditions and should be compatible with sealant, primers, and substrates.

C. Bond Breaker: As recommended by the sealant manufacturer.

D. Cleaning Agent: As recommended by the sealant manufacturer.

E. Masking Tape: Pressure sensitive adhesive paper tape.

F. Sealant Tape:

1. Compressible adhesive-cohesive tape of cross-linked butyl polyisobutylene rubber that accommodates variations and movement, sized as necessary to allow for joint movement of ± 25%.

2. Acceptable Product: PTI 606, from Protective Treatments, Inc.

G. Colors: As selected by Architect from manufacturer's standard color chart.

H. Expansion Joint Filler:

1. Closed cell polyethylene compatible with sealant.

2. Acceptable product:

a. Sonoflex, from Sonneborn-Contech.

b. Poly-Tite, from Sandell Mfg.

PART 3 - EXECUTION

3.01 INSPECTION

A. Examine joints to be sealed for construction defects which would adversely affect execution of work. Report all known detrimental conditions immediately in writing to the Contractor, for correction by the Contractor.

3.02 PREPARATION

A. Cleaning: Clean joint surfaces using joint cleaner as necessary to be free of dust, dirt, oil, grease, rust, lacquers, laitance, release agents, liquid water repellent, moisture, or

other matter which might adversely affect sealant adhesion.

B. Primer: Apply primer, if recommended by sealant manufacturer, to dry surfaces prior to joint backing, bond breaker, or sealants.

C. Joint Backing: In joints where the depth of the joint exceeds the required depth of the sealant, install joint backing to provide backing and uniform depth of sealant. Joint backing shall be installed with approximately 30% of compression. Do not stretch, twist, puncture or tear joint backing. Butt joint backing at intersections.

D. Bond Breaker Tape: Install bond breaker tape smoothly at back of joint where joint backing is not required or cannot be installed. (Sealant shall adhere only to the sides and not to the back of the joint so as to eliminate three-sided adhesion.)

3.03 INSTALLATION

A. Sealant Application: Apply sealant in accordance with manufacturer's application manual and instructions, using handguns or pressure equipment with proper nozzle size, on clean, dry, properly prepared substrates. Force sealant into joint against sides of joint to make uniform. Avoid pulling of the sealant from the sides. Fill sealant space completely with sealant.

B. Tooling: Tooling is required to ensure firm full contact with the interfaces of the joint. Tool joints to form smooth, uniform beads with slightly concave surfaces. Finished joints shall be straight, uniform, smooth, and neatly finished. Remove any excess sealant from adjacent surfaces of joint, leaving the work in a neat, clean condition.

C. Where an irregular surface or insensitive joint border exists, the applicator shall apply masking tape at the edge of the joint to insure joint neatness and protection. Remove tape after sealant is applied.

3.04 CLEANING

A. Remove excess materials adjacent to joints by mechanical means or with oxylol, xylene, or mineral spirits as work progresses to eliminate evidence of spillage or damage to adjacent surfaces.

3.05 PROTECTION

A. Cure sealants and caulking compounds in compliance with manufacturer's instructions and recommendations, to obtain high early bond strength, internal cohesive strength, and surface durability. Advise contractor of procedures required for cure and protection of joint sealers during construction period, to prevent deterioration or damage (other than normal wear and weathering) at time of

Substantial Completion. Cure and protect sealants in a manner which will minimize increases in modulus of elasticity and other accelerated aging effects. Replace or restore sealants which are damaged or deteriorate during construction period.

3.06 SEALANT SCHEDULE

A. Interior and exterior joints subject to movement: Type 1 or 2 at Contractor's option and as recommended by manufacturer for joint condition.

B. Interior and exterior horizontal joints subject to foot and vehicular traffic: Type 3, self-leveling.

C. Interior horizontal and vertical joint not subject to movement (not including traffic): Type 4.

D. In contact with roofing or waterproofing materials: Type 3 or Type 4, low modulus, unmodified.

E. Unexposed wall joints: Type 5.

F. Fire stops and penetration seals: Type 6.

G. Acoustical Wall Edges: Type 7

END OF SECTION

THIS PAGE INTENTIONALLY LEFT BLANK

METAL DOORS AND FRAMES - SECTION

PART 1 - GENERAL

1.01 RELATED WORK

A. Section 06 20 00: Finish Carpentry.

B. Section 08 21 00: Wood Doors.

C. Section 08 71 00: Finish hardware.

D. Section 09 90 00: Painting.

1.02 SUBMITTALS

A. Refer to Section 01 30 00.

B. Shop drawings: Submit drawings showing completed details of door and frame construction.

1.03 DELIVERY, STORAGE AND HANDLING

A. Store doors under cover and off ground. Doors with dents or other defects not repairable will be rejected.

B. Store frames in upright position.

PART 2 - PRODUCTS

2.01 HOLLOW METAL DOORS

A. Shop fabricate and finish to required sizes and shapes. Form and weld with straight arises, edges, and corners; surfaces free from warp, wave, buckle, dents, or other defects. Use of excessive metallic filler to conceal manufacturing defects is not acceptable.

1. As standards of quality, exterior doors shall be equal to Steelcraft "B Series", Ceco "Medallion Series", Curries "747 Series", or Republic "DS Series".

2. As a standard of quality, interior doors shall be equal to Steelcraft "LF Series", Ceco "Regent Series", Curries "707 Series", or Republic "DE Series".

B. Fabrication:

1. Flush doors, 1-3/4 inches thick, 18 gage steel face sheets over stiffeners, faces free of seams or joints. Close top and bottom edges by welding flush or with recessed 18 gage spot welded channels. Weatherproof top edge of exterior doors. Turn face sheets over vertical edges of doors and mechanically interlock, or weld to 18 gage vertical edge channels.

C. Insulation: Door manufacturer's standard sound deadening material on door interior. Sound deadening material in labeled doors shall conform to UL requirements.

D. Cutouts: Make cutouts for required glazing and louvers; provide steel non-removable stops on outside face and removable stops on interior face.

E. Preparation for hardware: Factory prepare and reinforce doors for indicated finish hardware. Make cutouts and mortises for mortise hardware.

1. Provide 10 gage flat steel reinforcement for hinges: 16 gauge for locksets and surface applied hardware. All gages minimum.

2. Internal reinforcing shall prevent collapse of face sheets by stress of lockset installation. Provide reinforcement on both faces of doors for surface mounted closers, whether or not closers are indicated.

3. Perform drilling and tapping for mortise hardware at factory to templates furnished by hardware vendor. Drilling and tapping for surface applied hardware by hardware installer.

4. Comply with SDI-100, paragraph 2, 5, and Table IV, and SDI-107.

2.02 PRESSED METAL FRAMES

A. Frames shall be welded or knock-down type in accordance with CS242 as minimum requirements, plus additional requirements specified herein. Shop fabricates and finish with straight arises, edges and corners, surface free from warp, wave, buckle, dents, or other defects. Use of excessive metallic filler to conceal manufacturing defects is not acceptable. As a standard of quality knockdown or three-part frames shall be equal to “C Series” as manufactured by Timely.

1. Welded frames shall be field painted per Section 09 9000.

2. Knock-down or three-part frames shall be pre-finished at the factory. As a standard of quality, appearance and available colors, pre-finished frames shall be equal to those of Timely Products.

1. Primed frames will not be considered as pre-finished and shall be field painted per specification 09 90 00.

B. Fabrication: Manufacturer's standard, 16 gage steel (18 gauge minimum at interiors), cross section profile as shown, depth to suit wall thickness. Provide applied metal door and glazing stops where required.

1. Welded frames shall have header and jambs secured at corners by internal welding of faces or by welding or mechanical interlock, exposed joints neat and tight. Provide temporary metal spreaders at bottom of welded frames to maintain rigidity. Welding per applicable standards of AWS for high grade hollow metal work.

2. Transom frames shall be extension of jambs in one-piece, same profile as jambs unless otherwise shown. Provide glazing stops.

C. Anchors: Provide 3 anchors per door jamb, minimum, manufacturer's standard type, to securely fasten frames to wall construction involved (wire anchors not acceptable); also provide adjustable floor anchor at bottom of each door jamb. Provide minimum 2 anchors at end of frames. Anchors shall provide stiffness and rigidity to keep frames square, in accurate position without twisting, buckling, or warping. Anchors for labeled frames shall conform to UL requirements.

D. Preparation for hardware: Factory prepare and reinforce door frames for approved finish hardware. make cutouts and mortises for mortise hardware. Provide 10 gage steel reinforcement for hinges, 12 gage for lock strikes and closers, and 14 gage for surface applied hardware.

1. Provide reinforcement at head of frames for surface mounted closers whether or not closers are indicated.

2. Punch lock jambs of frames; install rubber door silencers per Section 08 71 00.

3. Provide steel housing closures for hardware mortise to prevent intrusion of plaster, mortar, or concrete.

4. Perform drilling and tapping for mortise hardware at factory to templates furnished by hardware vendor. Drilling and tapping for surface applied hardware will be done by hardware installer.

E. Sound deadening: Door frames shall have inside (concealed) faces coated with fibered asphalt emulsion similar to autobody undercoating. Apply over shop primer

1/8 inch thick and thoroughly dry before handling.

F. Metal frames for glass lights in metal doors to be door manufacturers standard, minimum, two-piece, 18-gauge steel with mitered and welded corners, counter sunk for boltheads, factory baked-on primer finish with field painted finish, complete with oval head sex bolts

2.03 PRIMING

A. Bonderize and factory paint doors and frames with one coat of baked-on rust inhibitive primer.

B. Back coat frames with asphaltic emulsion wherever frames will be in contact with concrete.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Pressed metal frames: Coordinate with trades involved. Install frames level, plumb and square, fit bottom of jambs snugly to floor. Securely brace frames to prevent damage or distortion; remove temporary braces and spreaders when no longer required.

B. Sealant: Seal perimeter of frames only where shown or required to fill space between frame and adjoining material. Sealant materials and application shall conform to applicable requirements of Section 07 92 00. Where sealant is entirely concealed and wall components forming door opening are not designed for differential movement, oil-based caulking compound may be used; otherwise, use one-part synthetic rubber sealant.

C. Doors: Install metal doors; hardware installation is specified in Section 08710. Conform to clearance specified therein.

D. Doors: Hang with clearances of 1/8 inch at head and jambs, and 3/8 inch at thresholds, unless otherwise indicated or required for rated assemblies. Apply hardware in accordance with SDI-100 and the manufacturer's written instructions.

E. Set wire glass with wire glass pattern to opening.

F. Coordinate installation of hardware.

3.03 ADJUST AND CLEAN

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

B. Check and re-adjust operating finish hardware items, leaving metal doors and frames undamaged and in complete operating condition.

3.04 PROTECTION

A. Protect work and materials of this Section prior to and during installation and protect the installed work and materials of other trades.

B. In the event of damage, immediately make all repairs and replacements necessary to the approval of the Architect and at no cost to the Owner.

- END OF SECTION-

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 08 21 00 – WOOD DOORS

PART 1 - GENERAL

1.01 RELATED WORK

A. Metal Frames: Section 08 10 00

B. Section 08 71 00: Door hardware

C. Section 09 90 00: Painting

1.02 SUBMITTALS

A. Refer to Section 01 30 00 - SUBMITTALS.

B. Manufacturer's data: Submit complete specifications of door construction and manufacturer's literature for each type of door required.

C. Certification: Submit letter with doors, certifying that doors comply with applicable portions of Section 20, Manual of Millwork of Woodwork Institute (WI), latest revision.

D. Guarantee: Guarantee doors against warping or twisting (not to exceed 3/16 inch from straight line measured top to bottom of door), face-checking or other defects. Guarantee period shall be life of installation for interior doors. Guarantee shall cover replacement of door plus costs of hanging and finishing.

1.03 DELIVERY, STORAGE AND HANDLING

Carefully pack and protect doors against damage while in transit and in storage. Materials that will stain or discolor hardwood finishes shall not be used. Store under cover in heated rooms, and in manner that will best protect materials from damage, including excess humidity.

PART 2 - PRODUCTS

2.01 MATERIALS AND CONSTRUCTION

A. Solid core flush veneered wood doors: WI Custom Grade, 5-ply, made up of face veneers, cross-bandings, and core unit, or 7-ply made up of face veneers, cross-bands, back veneers, and core unit; securely bonded together by hot plate process.

1. Use CS35 Type I (fully waterproof) adhesive for bonding face and back veneers and cross-banding to each other and to core; use Type II (water

resistant) adhesive for bonding core unit strips and edge banding.

2. Bonded core field may be particle board per ANSI A208.1 and CS 236-66, or any combination of blocks or strips, with end joints tight, well staggered in adjacent rows, and with blocks or strips securely edge glued together under pressure. No open spaces between core blocks or strips; no defects in core blocks or strips large enough to show through face or materially affect strength of door.

3. Provide vertical edge bands, not less than 1 inch thick, any hardwood species closely matching face veneer in density and appearance. Provide top and bottom edge bands 2-1/4" inch thick with hardwood edge band, any species having density same as core species. Securely glue edge bands to core. Top and bottom bands may be secured in place with machine joint. Doweling of vertical to horizontal edge bands for oversize doors is permitted.

4. Face veneers for painted finishes: Meet requirements of paragraph 3.11.1 of NWMA I-S.1 birch species, uniform light, for paint and transparent finishes. Match for color at joints. Provide paint grade at locations as noted.

   A. Rotary cut Birch for Paint finishes.

5. Cutouts: Article III D, Section 20, WI, shall apply. Seal edges of cutouts with spar varnish. Provide two sets of glazing molds, with one side removable. Set molds back from edges of openings not more than total thickness of face veneer and cross-banding.

6. Provide solid blocking at all locations for mounting of hardware.

7. Doors shall be delivered to the project site fully primed or sealed and finished according to the door schedule.

B. Caulking and sealant at glazing at vision panels shall be rated.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install wood doors plumb and square. Prepare doors to receive hardware; hardware installation is specified in Section 08 71 00.

B. Fit doors to clearance indicated in "Door Clearance" and "Hardware Placement" articles in Hardware Section. Do not trim fitted doors more than 1/4 inch from any edge.

END OF SECTION

THIS PAGE INTENTIONALLY LEFT BLANK

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Furnish and install all aluminum window types, as indicated in the Drawings and specified herein. Coordinate with all trades involving glazing materials.

1.02 RELATED WORK

A. Section 03300: Concrete

B. Section 04220: Concrete masonry unit.

C. Section 06100: Rough carpentry.

D. Section 07410: Metal siding.

E. Section 07920: Sealants.

F. Section 08410: Storefront

G. Section 08800: Glazing.

H. Section 09320: Thin brick veneer.

1.02 TESTING AND PERFORMANCE REQUIREMENTS

A. Test Procedures and Performance:

1. Specifications for Windows, Doors and Unit Skylights: AAMA/WDMA/CSA 101/I.S.2/A440- 05, A440-08

2. Air Infiltration Test: ASTM E 283, at 6.24 psf static air pressure differential. Air infiltration shall not exceed 0.30 CFM per sq. ft.

3. Water Resistance Test: ASTM E 331 and ASTM E 547, no water leakage at 15 psf static air pressure differential.

4. Operation and Cycling Performance: AAMA 910-10, life cycled and retested for air and water.

5. Uniform Load Deflection Test: ASTM E 330, at static air pressure of +/- 65 psf. No member shall deflect more than 1/175 of its span.

6. Uniform Load Structural Test: ASTM E 330, at static air pressure difference of +/- 97.5 psf.

7. Condensation Resistance Test: AAMA 1503.1, CRF frame value not less than 60.

8. Thermal Transmittance Test: AAMA 1503.1, U-Value not greater than .45

9. Forced Entry Resistance: ASTM-F588, Type A – Grade: 40 Minimum.

1.03 REFERENCES

A. AAMA (American Architectural Manufacturers Association)

B. ANSI (American National Standards Institute)

C. ASTM (American Society for Testing and Materials)

D. GANA (Glass Association of North America)

1.04 SUBMITTALS

A. Refer to Division 1.

B. Provide submittals in a timely manner to meet required construction completion schedule and in accordance with specifications.

1. Shop Drawings:
   a. Show components complete with dimensions, material and details of anchoring and fastening.
   b. Show finishes, sealants and other information indicating compliance with specifications.
   c. Submit test report per 1.02 TESTING AND PERFORMANCE REQUIREMENTS.
2. Samples:
   a. Components: submit samples of anchors, fasteners, hardware, assembled corner sections and other materials and components if requested by architect.
   b. Finish: submit full range color samples for approval by Architect.
3. Warranties: submit written copies in accordance with - 1.06 WARRANTIES.

1.05 DELIVERY, STORAGE AND HANDLING

A. Protect materials from damage before installation per instructions and in accordance with specifications.

1.06 WARRANTIES

A. Window System:
Qualified window manufacturer, with proven financial responsibility and years of experience of at least the length of the warranty period shall provide written 10-year warranty against defects in materials and workmanship. Submit 5 year written guarantee for water tightness of windows and perimeter seal and joints. Guarantee shall cover damage from leaks due to defective materials or workmanship.

PART 2 - PRODUCTS

2.01 MANUFACTURER

A. Oldcastle Building Envelope®. Drawings and Specifications are based on Signature™ Series Fixed, which are used in this specification as a standard.

2.02 MATERIALS

A. Aluminum: 6063-T5 alloy shall have 0.062” wallthickness.

1. Extrusions: comply with ASTM B 221. Extrusion tolerances shall meet ANSI H35.
2. Sheet: comply with ASTM B 209.
3. Frame Depth: 4"
4. Ventilators:
   a. Depth: 4"
   b. Design: flush with perimeter frame
5. Thermal Barrier: Crimped-in-place glass reinforced polyamide 6/6 nylonstrut

B. Hardware: material shall be corrosion resistant and compatible with aluminum. Hardware must prove its strength and suitability by being installed on units that are tested in accordance with specifications.

1. Fasteners: provide non-magnetic stainless-steel screws,epoxy

adhesives, or other material warranted by the manufacturer.

2. Operating Hardware: Manufacturer's standard
   a. Sweep locks
   b. Stainless steel rollers
   c. plunger locks
   d. Balances: Ultra Lift

C. Sealants: color of exposed sealants shall be compatible with adjacent window materials. Comply with AAMA 803.3.

D. Glazing: windows shall be factory glazed unless too large or unsafe for handling.

1. Glass: provide in accordance with Section 08800.
2. Glazing Materials: units shall be exterior wet glazed using silicone sealant, setting blocks, edge blocks, and accessories as recommended by and in accordance with GANA Glazing Manual.

E. Weatherstripping: shall be non-shrinking, resistant to ultraviolet degradation, and replaceable closed cell elastomer shall meet ASTM C 509. Dense elastomer shall meet ASTM C 864.

1. Ventilators: provide two rows of pile type gasket that is easily replaceable.

F. Screens: shall be 18 x 16 black aluminum mesh, standard, with frames the same finish as window surface.

2.03 FABRICATION

A. Frames: shall be machined, mechanically fastened and sealed to form a watertight joint.

B. Ventilators: machined, mechanically fastened, and sealed to form a watertight joint.

C. Component Forming: all aluminum components shall be formed, free of scratches and burrs, before application of finish.

2.04 FINISHES

A. Cover all exposed areas of aluminum windows and components. Overall finish shall be 70% Polyvinylidene Fluoride.

1. Type: high performance baked-on organic coating.
2. AAMA Specification: Comply with AAMA 2605.

3. Aluminum Association Designation: AA-M10-C22-A4X.
4. Color to be selected from Manufacturer's standard colorrange.

PART 3 - EXECUTION

3.01 INSPECTION

A. Verify that openings are dimensionally within allowable tolerances, plumb, level, clean, provide a solid anchoring surface and are in accordance with approved shopdrawings.

3.02 INSTALLATION

A. Install windows with skilled tradesman in accordance with approved shop drawings and specifications.

B. Unfinished aluminum shall be insulated from direct contact with steel, masonry concrete, and non-compatible materials by bituminous paint, zinc chromate primer or othersuitable insulating material.

C. Install vapor retarder/air barrier in accordance specifications between window perimeter and adjoining collateral materials and existingwall barriers to assurecontinuity.

D. Plumb window faces in a single plane for each wall plane. Erect square and true. Anchor to maintain position when subjected to normal thermal and building movement, seismic forces and specified wind loads.

E. Apply sealants at joints and intersections and at opening perimeters in accordance with approved shop drawings and Section 07900 to provide watertightinstallation.

3.03 FIELD QUALITY CONTROL

A. Conduct on-site air and water infiltration tests in accordance with AAMA 502, ASTM E 783, ASTM E 1105 and with Architect and window manufacturer's representative present. Architect will select units to be tested. Air infiltration shall not exceed 1.5 x air infiltration amount specified for laboratory testing.

B. Tested units not meeting specified requirements and units having similar deficiencies shall be corrected at no cost to owner.

C. Cost for successful tests shall be paid by owner. Unsuccessful tests shall be paid by contractor.

D. Testing shall be by agency acceptable to architect and window manufacturer and employed by contractor.

3.04 ADJUSTING AND CLEANING

A. After installation and testing, windows and glazing shall be inspected, adjusted, and left clean and free of labels and dirt. Protect finished installation against damage.

B. Final cleaning of anodized finish shall be in accordance with AAMA 609.1; painted finish shall be in accordance with AAMA 610.1.

END OF SECTION

SECTION 08 71 00 – FINISH HARDWARE

PART 1 - GENERAL

1.01 SCOPE:

A. Furnish and install as directed finish or "builders" hardware in accordance with Drawings and as specified. Finish hardware includes hardware for all doors, and other movable parts of building.

B. Intent of this section is to include all items of finish builder's hardware, except only those items specifically excluded here or noted on Drawings as NIC (Not in Contract). Hardware supplier shall be responsible for examining Drawings and Specifications and furnishing all hardware indicated on Drawings and/or specified here.

C. Verify hardware items specified or indicated on Drawings for intended installation, proper size, function, code, and Label requirements. Discrepancies shall be called to Architect's attention, not less than 7 days prior to bid opening, for instructions. No extra cost shall be allowed for changes necessary to these hardware items. Provide finish hardware with proper strikes, fasteners, and accessories to suit job conditions.

D. Provide low voltage wiring for access control equipment and electrified door hardware. Furnish conduit to suit.

E. Furnish miscellaneous locks, cores and cylinders to work described under other sections of these specifications.

1.02 RELATED WORK

A. Section 06 20 00: Finish Carpentry

B. Section 08 10 00: Metal Doors and Frames.

C. Section 08 20 00: Wood Doors.

1.03 SUBMITTALS

A. Refer to Section 01 30 00 - for submitting the following:

1. List finish hardware proposed for this project, giving manufacturer's name and catalog number with specified item, and name of manufacturer if a substitute item is offered. Submittal required.

2. Product data. Submittal required.

3. Hardware Schedule (upon request): Submit at least five copies of the final Hardware Schedule in format specified, complying with the construction progress schedule requirements (for each draft). Hardware schedules are intended for coordination of the Work. Review and acceptance by the Architect does not relieve the Contractor of his exclusive responsibility to fulfill requirements as indicated and specified in a timely manner. Submittal required.

4. Samples (upon request): Furnish only upon request, prior to submittal of the last draft of the Hardware Schedule, and prior to delivery of the hardware. Submit one sample of each exposed hardware unit, finished as required, and tagged with full description for coordination with the schedule. Sample will be reviewed by the Architect or his representative for design, color, and texture only. Compliance with other requirements is the exclusive responsibility of the Contractor.

    a. Samples will be returned to the supplier. Units which are acceptable and remain undamaged through submittal, review, and field comparison procedures may, after final check of operation, be used in the Work.

5. Certification or copies of closer testing conformance and 10-year manufacturer's warranty. Submittal required.

1.04 TEMPLATES

Furnish templates for hardware to be secured to metal work, and for other hardware requiring templates, to provide accurate setting and fitting. Furnish in ample time so as not to delay work.

1.05 PROTECTION

Protect hardware against deterioration and damage. Store in clean, dry area until installed.

1.06 QUALITY ASSURANCE

A. Qualifications of Supplier: The finish hardware supplier shall provide the services of an Architectural Hardware Consultant (AHC), a member of the Door & Hardware Institute for consultation at no additional cost to the Owner during course of construction.

B. Reference: ANSI standards A115 and A156 are to be used to define quality standards for Finish Hardware.

C. Catalog Standards: Manufacturer's catalog numbers in the Specifications are for convenience in identifying items; catalog descriptions of these items constitute minimum requirements.

1. The use of catalog numbers and specific requirements set forth in Drawings and Specifications does not preclude the use of any other acceptable manufacturer's products or procedures which may be equivalent but establish a standard of design and quality for materials, construction, and workmanship.

1.07 DOOR CLEARANCES

A. Unless detailed otherwise on Drawings, provide following door clearances:

1. Clearance:

Labeled doors	3/8" max over floor or threshold
No threshold	3/4" max for metal doors
	5/8" max for wood doors
Threshold	1/8" typical
Carpet	1/8" over top of nap

2. Head and jamb clearance: 1/8" max.

1.08 HARDWARE PLACEMENT

Unless detailed otherwise, place hardware at following height above finish floor:

Latch set (centerline)	40-5/16"
Hinges	Per Title 24, Manufacturer's Standard
Door pull (centerline)	42"

PART 2 - PRODUCTS

2.01 KEYING

A. Provide wrought boxes for strikes.

B. Factory key cylinders.

C. Furnish the following keying. Provide 5 keys per each new keyed lock

D. Key into existing keyway system.

2.02 BUTTS AND HINGES

All butts shall have security lugs and non-removable pins for exterior doors. All butts for doors shall be ball or oilite bearing unless otherwise indicated. Labeled doors shall have steel butts, sheradized or zinc-plated prior to final plating. Interior butts shall be steel. All butts shall be of proper width to clear trim projection when the door swings 180 degrees. Non removable pins at security side of lock set s.

2.03 CLOSERS

Key value type. Furnish one key for each 5 closers. Fasten with 2 sex bolts per closer. Provide 180 degree opening where indicated. Provide parallel arms with jamb attachment for all out-swinging doors. Provide correct brackets at flush transom panel doors. All closers to have hold/open capabilities and integral stops. Closing effort shall not exceed a maximum operating effort of 8.5 lbs for exterior doors; 5.0 lbs for interior doors; 15.0 lbs for fire rated doors.

2.04 SCREWS, BOLTS, AND FASTENING DEVICES

Exposed heads oval Phillips type in countersunk holes, unless otherwise specified or required. Use screws, bolts, washers, grommets, nuts, and other fastening devices of appropriate length, type, head, metal and finish, as necessary for proper match and application of hardware.

2.05 LOCKSETS AND LATCHSETS

A. Heavy-duty cylinder type with lever handle; style and finish as to match existing.

2.06 HANDLING AND MARKING

Furnish hardware in proper "hand" for doors. package and mark hardware for door number, hardware type and location.

2.07 FINISHES

In general, provide finishes as follows, unless otherwise indicated:

Hinges: Match existing, US 26D (626)/US (32D)
Locks: Match existing, US 26D (626)
Closers SPRAYED ALUM
Trim: Match existing, US 32 (630)
Stops US 26D (626)
Special Items: Match existing, MILL FINISH
Others: Match existing, US 26D (626)

2.08 KICK PLATES

BBW No. 37 -2" LDW x 12 or equal. Provide at Restrooms and as scheduled on the Drawings

2.09 CLOSERS

LCN 4010 Series and 4110 parallel arm to suit swing.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install hardware in precise manner, in accordance with manufacturer's instructions; door clearance and hardware placement as specified. Predrill pilot holes in wood for screws. Drill and tap for surface mounted hardware on metal. Set hinge leaves snug and flat in mortises; turn screws to flat seat (do not drive).

B. Mount door closers for maximum swing of door before setting stops. Silencers in place before adjusting strikes. Drive hinge pins down and tighten set screws.

C. Install locks with keyways in proper position, and knobs, roses and escutcheons firmly affixed.

D. Set thresholds in waterproof sealant and secure with lead shields and countersunk screws of same finish as threshold.

E. Except for hinges, do not install hardware until completion of painting and finishing work.

F. Adjust hardware so that moving parts operate freely without bind or excessive play. Installed hardware shall be free from paint, corrosion or damage.

G. Adjust closers for closing speed, latching speed, back checking, and adjust hold-open devices for full control of door.

3.02 INSTALLATION AIDS, INSTRUCTION AND MAINTENANCE GUIDES

Upon completion of installation and adjustment, turn over to Owner dogging keys, closer valve keys, lock spanner wrenches, and other factory furnished installation aids, instructions and maintenance guides.

3.03 HARDWARE TYPES LIST

A. Catalog numbers used herein are those of following manufacturers:

Hinges……	Stanley
Locksets, Cores and Cylinders……	Match Existing
Closers……	LCN
Panic Exit Device……	Von Duprin
Trim……	Glynn Johnson, Pemko
Floor/Wall Stops……	Glynn Johnson
Silencers……	BBW
Thresholds/Smokeseals/Soundseals……...	Pemko

B. Hardware of same quality, material, and function by other manufacturers will be accepted, subject to approval of the Architect.

C. Hardware Groups:

GROUP A: (Single, SC Wood, Privacy lock, non-rated)
Unisex Restrooms

1 1/2 pr.	Butts	Stanley FBB179 - 4 1/2" x 4 1/2"
1	Privacy Lockset	ANSI F76 x Lever
1	Self-closer	LCN
3	Silencers	BBW W-07
1	Wall Stop	GJ WB9X

GROUP 2: (Single, SC Wood, Passage, non-rated)
Open office

1 1/2 pr.	Butts	Stanley FBB179 - 4 1/2" x 4 1/2"
1	Office Lockset	ANSI F82 x Lever
3	Silencers	BBW W-07
1	Wall Stop	GJ WB9X

GROUP 3 (Single, Hollow Metal, Exterior Entry, non-rated),
Lobby & Hall

1 1/2 pr.	Butts	Stanley FBB179 - 4 1/2" x 4 1/2" S/S NRP
1	Exit Device	Rim Exit Device CD99L-NL x 992L-Rx06 lever
1	Cylinder	Match existing key-way
1	Storeroom Lockset	ANSI F86 x Lever

1	Closer	LCN
1	Weatherstripping	Pemko 297AS
1	Automatic drop seal	Pemko 420SL (concealed)
1	Floor stop	Trimco F1211
1	Door bottom drip	Pemko 345 width door
1	Door head drip	Pemko 346C width door plus 4”
1	Threshold set	Pemko 195A, 192A (3"), (196A as occurs)
1	Card Reader	TBD

GROUP 4 (Single, Hollow Metal, non-rated)
(Exterior Entry)

	1 1/2 pr. Butts FBB179 - 4 1/2" x 4 1/2" S/S	Stanley NRP
1	Exit Device	Rim Exit Device CD99L-NL x 992L-Rx06 lever
1	Entry Lockset	ANSI F102 x Lever
1	Cylinder	Match existing key-way
1	Closer	LCN
1	Weatherstripping	Pemko 297AS
1	Automatic drop seal	Pemko 4131 NBL (concealed)
1	Floor stop	Trimco F1211
1	Door bottom drip	Pemko 345 width door
1	Door head drip	Pemko 346C width door plus 4”
1	Threshold set	Pemko 195A, 192A (3"), (196A as occurs)
1	Card Reader	TBD

- END OF SECTION-

THIS PAGE INTENTIONALLY LEFT BANK

008 82 00 - GLAZING

PART 1 - GENERAL

1.01 SCOPE

A. Provide glass and glazing as shown on Drawings and specified here, including glazing materials and accessories as required.

1.02 RELATED WORK

A. Section 08 41 13 – Aluminum Entrance at Storefront

1.03 SUBMITTALS

A. Refer to Section 01 33 00 - Submittals.

B. Samples: Submit sample of each type of glass with identifying labels.

C. List of materials: Submit list of materials proposed for use, with glazing conditions and locations for each material, together with manufacturer's statements certifying that materials and methods proposed are recommended for accomplishing best results for each condition.

1.04 QUALITY ASSURANCE

A. Glass delivered to job site shall be labeled with glass manufacturer's identity, type of glass, thickness and quality or an affidavit or other satisfactory evidence may be submitted for glass furnished unlabeled as "stock to cut".

B. Specified thicknesses are subject to normal commercial tolerances. Watertight and airtight installation of each piece of glass is required. Each installation must withstand normal temperature changes, wind loading, impact loading (for operating sash and doors) without failure of any kind including loss or breakage of glass, failure of glazing compound or glazing beads or gaskets to remain watertight and airtight, deterioration of glazing materials and other defects in the work. Glazing channel dimensions as shown, are intended to provide for necessary minimum bite on the glass, minimum channel thickness and edge clearance and adequate glazing compound thicknesses, with reasonable tolerances.

C. Conform to Flat Glass Marketing Association Glazing Manual, as modified herein, or as modified by glass manufacturer's instructions. Recommended materials and methods are mandatory (where words "work by other" are used, they shall mean "work in other sections of these specifications").

D. Notify Architect in writing prior to bid opening, of any scheduled or specified glass that exceeds manufacturer's limitations. If this notification is not given, Contractor shall be responsible for providing proper thickness of glass at no additional cost to Owner, for a discrepancy between glass scheduled and manufacturer's recommendations.

E. Glass not specifically called for herein shall be furnished similar to other openings and of thickness recommended by glass manufacturer, labeled with the manufacturer's name and the grade or quality grade. Labels shall remain intact until completion of work or until removal is directed.

008 82 00 - GLAZING

1.05 REFERENCES

A. "Glazing Manual" and "Glazing Sealing Systems Manual" of Flat Glass Marketing Association and printed recommendation of the manufacturer of materials being used, except as hereinafter modified.

B. Federal Specification DD-G-451.

C. Safety Standard for Architectural Glazing Materials (16 CFR 1201) of the Consumer Product Safety Commission, as amended to date.

D. American Society for Testing and Materials, C1036-85 and C1048-85.

E. CBC, California Building Code, Chapter 24.

1.06 SUBMITTALS

A. Refer to the General Conditions for submitting the following:

1. Product Data. Submittal required.

2. Installation instructions upon Architect's request only.

3. Samples:

a. Submit approximately 6" x 6" samples of each type of glass to be used.

(1) Exception: Where type of glass to be furnished is trade name specified, submit only requested samples.

1.07 DELIVERY, STORAGE AND HANDLING

A. Deliver glass in suitable containers that will protect glass from weather and breakage.

B. Deliver sufficient glass to allow for normal breakage.

C. Carefully store materials in a safe place where breakage can be reduced to a minimum.

1.08 PROJECT CONDITIONS

A. Pre-Installation: Meet with Glazier and other trades affected by glass installation prior to beginning of installation. Do not perform work under adverse weather or job conditions. Install liquid sealants when temperatures are within lower or middle third of temperature range recommended by manufacturer.

B. Do not apply any compound or sealant at temperatures lower than 40 degrees F or on a damp, dirty, or dusty surface.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Guardian Glass. (Specified)

B. Versalux

C. Libby Owens Ford Company

D. Ford Motor Company; Glass Division.

E. Approved equal.

2.02 MATERIALS

B. Type 14FT: Clear tempered float glass; ASTM C1048-85 and Federal Specification DD-G-1043b, Type 1, Class 1, Quality q3. Heat strengthened by manufacturer's standard process (after cutting to final size) to achieve a flexural strength 4 times normal glass strength; 1/4" thickness. All tempered glass to have permanent logo signifying compliance with the Consumer Product Safety Commission 16 CFR 1201 C1 and C11.

C. Type 14F: Clear float glass; ASTM C1036-85 and Federal Specification DD-G-451d, Type 1, Class 1, Quality q3; 1/4" thickness. Provided twin-ground glass which has been ground simultaneously on both faces by manufacturer's standard process to make faces parallel and thickness uniform.

D. Type 14BT: Tempered Blue tinted float glass; Visible light transmittance of 51%, shading coefficient of .27, SHGC .23, reflectance of 14% ASTM C 1048-85 and Federal Specification DD-G-1403, Type 1, Class 1, Quality q3. Heat strengthened by manufacturer's standard process (after cutting to final size) to achieve a flexural strength 4 times normal glass strength; 1/4" thickness. All tempered glass to have permanent logo signifying compliance with the Consumer Product Safety Commission 16 CFR 1201 C1 and C11. Equal to ¼" Guardian Glass SNX 51/23.

E. Type 14BF: Blue tinted float glass; Visible light transmittance of 51%, shading coefficient of .27, SHGC .23, reflectance of 14% ASTM C1036-85 and Federal Specification DD-G-451, Type 1, Class 1, Quality q3; 1/4" thickness. Equal to ¼" Guardian Glass SNX 51/23.

F. Type 1GTI:

1. Insulated dual glazed units with Type 14FT interior lite and Type 14GT exterior lite. Overall thickness: 1" (25 mm). System: Visible light transmittance of 51%, shading coefficient of .27, SHGC of .23, reflectance of 14% ASTM C1036-85 and Fed. Spec. DD-G-451.

a. Type 14BT: Tempered blue tinted float glass; Equal to Guardian Glass SNX 51/23.

b. Type 14FT: Clear tempered float glass.

c. 1/2" (12.7 mm) thick sealed air space.

G. Type 1GFI:

1. Insulated dual glazed units with Type 14F interior lite and Type 14GF exterior lite. Overall thickness: 1" (25 mm). System: Visible light transmittance of 35%, shading coefficient of .27, SHGC of .23, reflectance of 14% ASTM C1036-85 and Fed. Spec. DD-G-451.

a. Type 14GF: Blue tinted float glass; Equal to Guardian Glass SNX 51/23.

b. Type 14F: Clear float glass.

c. 1/2" (12.7 mm) thick sealed air space.

H Glazing materials: Best quality materials, factory mixed, recommended by manufacturers for each type of glazing condition. Provide glazing and bedding putties not requiring painting (to match color of frame), sealants, tapes, and other materials necessary to perform glazing work properly. Provide setting blocks, shims, compression seals, felt and neoprene or vinyl glazing channels as required for first quality job.

I. Butyl glazing tape: 3M #1202T or approved equal.

J. Sealant: One-part silicone; "Dow Corning 790" or approved equal.

K. Sealant: Two-part silicone; "Dow Corning 983", "GE Ultraglaze 4400" or approved equal.

PART 3- EXECUTION

3.01 INSPECTION

A. Inspect all sash, frames, and surrounds to be glazed, and notify Contractor of any defects, improper materials or workmanship or other conditions which will affect satisfactory installation of glass. Do not proceed with glazing until such conditions have been corrected. Absence of notification, or beginning of glazing, shall constitute acceptance of all previously placed related work executed by other trades; later claims of defects in such work will not relieve glazier from responsibility to produce satisfactory work. Following work will be executed by other trades, but before starting glazing work, verify compliance with stated requirements:

1. That sash and frames are firmly anchored in proper position, plumb and square within 1/8 inch (3.2 mm) of nominal dimensions on Drawings and approved Shop Drawings.

2. That all rivet, screws, bolts or nail heads, welding fillets and other projections are removed from glazing rabbets to provide required clearances.

3. That all corners and fabrication intersections are sealed, and sash and frames are

weathertight.

3.02 PREPARATION

A. Sizes of glass indicated on Drawings are approximate only; determine actual sizes required by measuring frames to receive glass at Project Site. Dimensions for glass and glass holding surrounds shall be coordinated to provide required minimum clearances.

B. Preparation of Glass and Rabbets: Clean sealing surfaces, including removal of protective coating from aluminum, at perimeter of glass and sealing surfaces of rabbets and stop beads before applying any glazing sealant or tape. Use only approved solvents and cleaning agents recommended by the compound manufacturer.

3.03 INSTALLATION OF GLASS

A. Glazing Fixed Glass Frames with Removable Stops:

1. Center glass in glazing rabbet to maintain required Clearances at perimeter on all four sides. Maintain centered position of glass in rabbet and provide glazing tape of required thickness (1/16 inch minimum) on both sides of glass. Whenever glass dimensions exceed 50 united inches, provide setting blocks at sill and spacer shims on all four sides; locate setting blocks 1/4 way in from each end of glass.

2. Apply butyl tape, full width of stop face, to each face of stops with evenly applied pressure, and allow it to overlap sight line. Place setting blocks and spacer shims as required. Press glass into position and secure in place by application of removable stops. Secure metal stops with self-tapping oval head machine screws. Dimple frames to countersink screw heads.

3. Trim excess tape flush on both sides of glass to provide clean sight line. Apply sealant to result in assembly that is completely air and watertight and neat in appearance.

B. Glazing Lights in Doors with Metal Glass Lite Frames:

1. Bed glass between metal glass lite frames with glazing tape. Apply tape full width of each stop face with evenly applied pressure, allowing it to overlap sight line. Apply stops to each side of glass with evenly distributed firmness and tighten binder post through bolts so as to apply firm, uniform pressure to tape. Trim excess tape flush on both sides of glass to provide clean sight line. Tape thickness on each side of the glass shall be 1/16-inch (1.6 mm) nominal.

3.04 ADJUSTING AND CLEANING

Upon completion of glazing, thoroughly clean all glass surfaces, correct all imperfections, replace all damaged glass, and leave all labels on the glass until they have been inspected and approved by the Architect but remove all labels immediately thereafter.

3.05 CURE, PROTECTION AND CLEANING

008 82 00 - GLAZING

A. Cure glazing sealants and compounds per manufacturer's instructions and recommendations.

B. Protect exterior glass from breakage immediately upon installation by attachment of crossed streamers to framing held away from glass. Do not apply markers of any type to surfaces of glass.

C. Protect finished surfaces from scratches, abrasions and other damage; marred or damaged work will be rejected.

D. Remove and replace glass which is broken, chipped, cracked, abraded, or damaged in other ways during the construction period at no additional cost to the Owner.

E. Maintain glass in a reasonably clean condition during construction, so that it will not be damaged by corrosive action and materials which might contribute (by wash-off) to the deterioration of glazing materials and other work.

F. Leave all labels on the glass until they have been inspected and approved by the Architect but remove all labels immediately thereafter.

G. Wash and polish glass on both faces not more than 4 days prior to Owner's acceptance of the work in each area. Comply with glass manufacturer's recommendations.

END OF SECTION 08 80 00

SECTION 09 10 00 – LIGHTGAUGE METAL FRAMING

PART 1 - GENERAL

1.01 SCOPE

A. Provide non-bearing interior light gauge metal framing and support systems including but not limited to studs, tracks, fabrications, anchors, fasteners, connectors, bracing, backing, furring and related accessories as shown on Drawings and specified here.

B. Provide and install all formed and fabricated sheet metal shapes which are part of the light gauge metal framing and support systems as indicated on the Drawings.

C. Provide and install all formed and fabricated sheet metal shapes which act as closers and retainers at expansion joints at light gauge framed partitions and furrings and at junctions of light gauge framed partitions and furrings to other walls and partitions, as indicated on the Drawings.

D. Provide flat, radiused and domed suspension systems including hangers and bracing to interior gypsum wallboard ceilings and soffits.

E. Provide and install all sheet metal anchored to horizontal suspended light gauge framing and support systems at gypsum board ceilings where indicated on the Drawings.

F. Provide and install all clips, anchors and attachment devices as required and as shown on the Drawings to secure metal framing and support systems to structure.

1.02 RELATED WORK

A. Section 05 50 00: Miscellaneous Metals

B. Section 06 10 00: Rough Carpentry

C. Section 07 21 00: Insulation

D. Section 09 25 00: Gypsum Wallboard

1.03 REFERENCES

A. The following references, codes and standards are hereby made a part of this Section and light gauge metal framing and suspension systems shall conform to the applicable requirements therein except as otherwise specified herein or shown on the Drawings. Nothing in the Drawings or these Specifications shall be construed as

permitting work, which is contrary to code requirements.

1. Specification for the Design of Cold-Formed Steel Structural Members, Current Edition, American Iron and Steel Institute (AISI) Cold Formed Steel Design Manual.

2. Specification for Metal Lathing and Furring, Metal Lath/Steel Framing Association.

3. American Society for Testing Materials ASTM A-446, Specification for Steel Sheet, Zinc Coated (Galvanized) by the Hot-Dip Process, Physical (Structural) Quality.

4. ASTM A-570, Specification for Hot-Rolled Carbon Steel Sheets and Strip, Structural Quality.

5. ASTM A-611, Specification for Steel, Cold-Rolled Sheet, Carbon, Structural.

6. American National Standards Institute ANSI A97-2, Installation of Steel Framing to Members to Receive Screw Attached Gypsum Wallboard and Backing Board.

7. California Building Code CBC, 2019 edition.

8. Lightweight Steel Framing Systems Manual, Current Edition, as published by Metal Lath/Steel Framing Association.

9. Specifications for Structurally Welding Sheet Steel in Structures (D1.3); American Welding Society (AWS): Structural Welding Code (D1.1).

10. ASTM Specifications C 754-82, "Installation of Steel Framing Members to Receive Screw-Attached Gypsum Wallboard, Backing Board or Water-Resistant Backing Board".

B. Metal framing for fire-rated assemblies, including materials and methods of application used, shall be approved by the I.C.B.O.

1.04 SUBMITTALS

A. Refer to Section 01 30 00 for submitting the following:

1. Product data, including structural properties. Submit upon Architect's request only.

2. Shop drawings: Submit documents illustrating materials, shop coatings, steel

thicknesses, details of fabrication, details of attachment to adjoining work, size, location, and spacing of fasteners for attaching framing to itself, details of attachment to the structure, accessories and their installation, and critical installation procedures. Drawings may include plans, elevations, sections, and details. Submit upon Architect's request only.

3. Samples: Samples shall be representative pieces of all framing component parts and accessories. Unless otherwise specified, pieces shall be 12" (304.8mm) long, tagged with name of part and manufacturer. Submit samples only on request.

4. Calculations: Engineering calculations or data shall be submitted verifying the framing assembly's ability to meet or exceed design requirements as required by local codes and authorities. Submit upon Architect's request only.

   a. Steel framing used to support rigid materials shall be designed for allowable deflection of L/360. Steel framing used to support semi-rigid materials shall be designed for an allowable deflection of L/240.

1.05 DELIVERY, STORAGE AND HANDLING

A. Deliver undamaged products to site in manufacturer's sealed containers or wrappings with legends and labels intact. Store on site secure from weather, soil and physical damage.

B. Handle and transport metal framing and support system products in accordance with the "Handling and Transportation" recommendations contained in the Lightweight Steel Framing Systems Manual, Current Edition, as published by the Metal Lath/Steel Framing Association.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Dale/Incor Light gauge Metal Framing, Dale Industries. (Specified)

B. Marino/ Ware, Ware Industries, Inc.

C. Ceco Corporation.

D. Superior Steel Studs, Inc.

E. Western Metal Lath Company.

F. Approved equal.

2.02 METAL FRAMING MATERIALS

A. All metal studs, runners, and accessories, unless otherwise specifically approved by the Architect, shall be galvanized steel.

B. Light gauge metal studs shall conform to ASTM C645 and the following additional requirements:

1. Formed from hot-dipped galvanized steel sheet; minimum coating G60 in accordance with ASTM A525.

2. All metal studs and accessories shall meet or exceed the minimum requirements of Federal Specification QQS-698 and QQS-775d, class D, for the item and use intended.

C. Studs and runners shall be channel-type, roll-formed, in the following sizes and gauges unless otherwise noted on the Drawings.

1. Interior Studs:

a. 20 gauge for 3-5/8" and greater studs (typical).

b. 18 gauge for 3-5/8" and greater studs at tiled walls. (Non-bearing or non-shear walls when approved by the Architect.)

c. 25 gauge for 3-5/8" studs at locations indicated or where approved by the Architect.

d. 20 gauge for 6" studs

e. 16-gauge studs in sizes and at locations as indicated on the Drawings.

f. 25 gauge for 1 5/8 studs.

2. Stud Design Characteristics:

a. 2-1/2" x 20-gauge steel studs: C-stud x 2-1/2" x 1-5/8" flange x 20 gauge similar to Dale/Incor CN product.

b. 3-5/8" x 18- and 20-gauge steel studs: C-stud x 3-5/8" x 1-5/8" flange x 18 and 20 gauge similar to Dale/Incor CN product.

c. 4" x 18- and 20-gauge steel studs: C-stud x 4" x 1-5/8" flange x 18 and 20 gauge similar to Dale/Incor CN product.

d. 6" x 18- and 20-gauge steel studs: C-stud x 6" x 1-5/8" flange x 18 and 20 gauge similar to Dale/Incor CN product.

e. 2-1/2", 3-5/8", 4" and 6" x 18- and 20-gauge tracks, stud tracks and track runners: 2-1/2", 3-5/8", 4" and 6" x 1-1/4" flange x 18 and 20 gauge similar to Dale/Incor TC products.

f. 1 5/8" x 25-gauge steel studs, tracks, and track runners to suit.

3. At all interior tiled walls, unless otherwise indicated, provide 18 gauge (minimum) galvanized punched C-studs, runners, and accessories equal to Dale/Incor CN and TC products. Subject to approval by the Architect at non-shear and non-bearing walls.

4. At locations as indicated on the Drawings, provide 16 gauge galvanized punched C-studs, runners and accessories equal to Dale/Incor CN and TC products.

5. Provide double studs at each side of all door openings, window openings and other framed openings equal to the same gauge of wall studs, but not less than 20 gauge, unless otherwise indicated on the Drawings.

6. 14 gauge galvanized cold rolled angle (CRA): 1-1/4" x 1-1/4" x 14 gauge as indicated on the Drawings or as otherwise required similar to Dale/Incor products.

7. 16 gauge galvanized cold rolled channel (CRC): 1-1/2" x 9/16" x 16 gauge as indicated on the Drawings or as otherwise required similar to Dale/Incor products.

Refer to Drawings for additional stud size and gauge information.

12-, 14-, 16- and 18-gauge steel joists equal to Dale/Incor JW, JWE and SCJ sections suitably sized and as indicated on the drawings.

D. Provide studs with web shaving not less than 2 knockouts, one of which being no more than 12" from bottom end of stud and at least one in upper 1/4 of stud length. Provide studs with at least 1 additional knockout located at approximate mid-height of stud at studs 12' in length and longer. Punch knockouts for horizontal alignment.

E. Provide lintels and headers fabricated from suitably sized double galvanized steel

joist sections equal to Dale/Incor JW, JWE and SCJ Joists.

2.03 FLOOR AND CEILING RUNNERS

A. Floor and ceiling runners for use with light gauge non-bearing metal studs shall be 16 gauge where indicated and stud manufacturer's regular type for size of studs required elsewhere, runners shall be same width and of equal or heavier gauge.

B. Where studs extend to underside of deck or structure above, ceiling runners shall not be attached to the deck or structural element, but shall be attached to specified ceiling deflection track, double receiving channels, or detailed slippage joints as indicated or scheduled below.

1. Ceiling deflection tracks shall be used at locations where studs are 20 gauge and lighter. Deflection tracks shall be equal to Superior #53, 20-gauge product.

2. Double receiving channels shall be used at full height wall locations where the stud size is heavier than 20 gauge and slippage joints are not otherwise detailed. Construction of double receiving channels shall consist of upper channels doubled back-to-back with legs at uppermost channel slipped over a receiving channel.

   a. Fabricate receiving channel from 16 gauge at interior walls, zinc coated steel sheet; 2-inch legs; width between outside face of flanges to provide tight slip-fit with stud ceilings runnerchannel.

   b. Top ceiling runner channels shall be fabricated from 16-gauge zinc coated steel sheet to same overall width as standard runner track and shall have 1-1/2 inch legs. Lower ceiling runners of back-to-back pair shall be manufacturer's standard as hereinbefore specified.

3. For 18- or 16-gauge studs to underside of structure at interiors provide SLP-TRK by Slip Systems, Inc., or approved equal.

4. Refer to the Drawings for special slippage joint details.

C. Floor and ceiling runners for use with metal studs shall conform to ASTM C645.

D. Form floor and ceiling runners from hot-dipped galvanized sheet steel; minimum coating G60 in accordance with ASTM A525.

E. Face of flanges of floor and ceiling runners to be heavily knurled for positive screw attachment.

2.04 METAL FURRING

A. Light gauge Furring Channel shall conform to ASTM C645 and the following additional requirements:

1. Formed from hot-dipped galvanized steel sheet; minimum coating G60 in accordance with ASTM A525.

2. Minimum 25 Galvanized Sheet Gauge, minimum 0.297 lbs./ft.

3. Hat-shaped in section with minimum 1-3/8" wide crown and minimum 7/8" deep. Brim formed with 1/2" flanges, stiffened with folded edges or longitudinally formed rib at centerline of each flange. Flanges may be 3/8" when 1/8" stiffened edge is upturned 90 degrees from brim. Crown shall be slightly recessed. Face of crown to be heavily knurled for positive screw alignment.

B. Steel Furring Channel: Hot-rolled or cold-rolled steel, galvanized or with rust-inhibitive paint; minimum weight in accordance with following:

Channel Size (inches)	Weight (pounds per 1000 lineal feet) Hot-Rolled	Cold-Rolled
3/4	300	300
1	410	410
1-1/2	1120	475

C. Curved Drywall Ceilings: Heavy duty USG Suspension System complete with cross tees and accessories for radius and dome installations as indicated on the drawings. Provide completely designed system complying with requirements of UBC Standard 25-2 and specified herein.

1. Requirements of UBC Standard 25-2 from Section 25-201 through Section 25.216.

2.05 METAL BACKING

A. Provide metal backing for all equipment, wall door hold open, wall door stops, grab bars and other items anchored to light gauge metal framing work, and as indicated. Fabricate from zinc coated steel sheet (ASTM A-526 with Commercial grade zinc coating in accordance with ASTM A-525). Except where heavier gauge and/or larger size is indicated, fabricate from not lighter than 16-gauge steel (12 gauge for grab bars) at least 6 inches wide, terminate on framing member each end. Refer to Drawings for additional information.

2.06 ACCESSORIES

A. Zinc-Coated Steel Sheet: ASTM A525, coating G60 minimum.

B. Hanger and Tie Wire: Galvanized, soft annealed carbon steel wire conforming to Federal Specification AA-W-461, AISI number 1010, or 1006, Class 1 zinc coating; U.S. Steel Wire Gauge, unless otherwise specified.

1. Hanger Wire: Prestraightened; gauges as specified.

2. Tie Wire: Gauges as specified.

C. Bridging: Cold formed steel channel or stud manufacturer's regular type bridging for studs with which used. Bridging shall be coated with a rust-inhibitive material.

D. Attachment Devices: Devices for attaching framing members to supports, or to each other, shall be galvanized steel wire, or sheet metal depending on use and manufacturer's requirements.

E. Welding Electrodes: AWS E60-XX.

F. Additional materials required for a complete and proper installation of metal studs shall be new, first quality, in strict accordance with the recommendations of the manufacturer of the metal furring used, and subject to approval of the Architect.

2.07 TOLERANCES

Partition and suspended ceiling framing and furring shall be sufficiently even to contact a 10' long straightedge, in any direction, with a tolerance of 1/8".

PART 3 - EXECUTION

3.01 INSPECTION

A. Prior to work of this Section, carefully inspect and verify that the installed work is complete to the point where this installation may properly commence.

B. Verify that metal framing and support systems may be installed in strict accordance with the original design and the manufacturer's recommendations.

C. In the event of discrepancy, immediately notify the Contractor. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.02 PREPARATION

A. Accurately lay out all partition and wall lines from the dimensions given on the Drawings and previously verified in the field by Contractor.

B. Erect materials of this Section in accordance with the referenced Standards.

3.03 INSTALLATION

A. Install all metal framing and support systems in strict accordance with the approved submittal of manufacturer's recommendations, anchoring all members in position for long life under hard use.

B. Coordination of backing and blocking:

1. Carefully coordinate all requirements for backing support of items to be mounted on the finished assemblies.

2. Carefully coordinate all requirements for pipes and other items designed to be housed within the partitions and wall system.

C. Floor and Ceiling Runners: Install all floor and ceiling runners to receive studs. Align runners accurately to assembly layouts at both floor and ceiling.

1. Where studs extend to underside of deck or structure above provide ceiling runners as hereinbefore specified, and as indicated.

a. Fill all voids between ceiling runners and deck or structure with rock wool safing insulation where fire rated walls extend to underside of deck.

2. Where studs extend to underside of wood deck or structure above, secure ceiling runners as follows or as otherwise indicated on the Drawings.

a. Secure with minimum of #12 pan head wood screws at 24" o.c. unless otherwise noted.

b. Fill void of top ceiling runner with rock wool safing insulation prior to installation where walls are fire rated.

3. Securely anchor runners to the supporting structure as shown on the Drawings.

4. Provide complete, uniform and level bearing support for the bottom runners.

5. Securely anchor abutting lengths of runners to a common structural element,

butt-welded or spliced.

6. Secure floor runners as follows at interior stud walls.

   a. At concrete slabs secure interior wall floor runners with "Ramset" or "Hilti" .177" x 1-1/2" or equivalent, powder driven fasteners on 2'-0" centers (maximum spacing) and within 6" of the ends of each runner and within 6" of the ends of each joint.

7. At other locations, secure runners on not more than 24" centers, within 2" of each end and within 2" each side of each joint.

   a. Secure with "Ramset" or "Hilti" .177" x 1-1/2" or equivalent, powder driven fasteners to concrete only; do not use on masonry.

   b. Secure runner track to ceiling framing by wire tying ceiling runner track to furring channels.

D. Metal Studs: Space studs at not more than 16" on centers, unless otherwise indicated or required by fire rated assemblies.

1. Except for studs above and below openings, install studs continuous from floor to ceiling runner track or underside of deck or structure where indicated. Splices in studs will not be permitted.

2. Studs to have full bearing on bottom of floor runner track.

3. Install studs plumb and aligned and securely attach to flanges of both upper and lower runners.

4. Provide temporary bracing, where required, until erection is completed.

5. Frame in openings with headers or lintels and install jack studs above and below openings.

6. Place studs in direct contact with all door frame jambs, abutting partition corners.

7. Provide double studs at door and window jambs.

8. Anchor all studs for shelf-walls and those adjacent to window frames, partition intersections and corners to ceiling and floor runner flanges by screw attachment or approved punch-lock crimp.

9. Anchor all studs adjacent to door frames to ceiling and floor runner flanges

by screw attachment only.

10. Securely anchor studs to jamb and head anchor clips of door and borrowed-light frames by bolt or screw attachment.

11. Anchor all headers and lintels to jamb studs by screw attachment.

12. Size and construct lintels, headers and gussets in accordance with the metal framing system manufacturer's recommendations as published in the manufacturer's product literature, for opening size, wall thickness and finish material design loads as required by the referenced Codes and Standards and as indicated on the Drawings.

13. Tie 18- and 16-gauge assemblies to lighter gauge assemblies that occur in the same construction with splices and straps in accordance with the metal framing system manufacturer's recommendations and standard construction details, the referenced Codes and Standards, and as indicated on the Drawings.

14. Unless otherwise indicated on the Drawings, secure runners to studs by screw attachment in accordance with the metal framing system manufacturer's recommendations and standard construction details and as required by the referenced Codes and Standards. In no instance shall the runners be secured to the studs with less than two (2) 5/8" low profile head framing screws at each side of stud.

    a. Screws shall be of sufficient size to insure the strength of the connection.

    b. Welded connections shall be only used when approved by the Architect and constructed in accordance with the metal framing system manufacturer's recommendations and standard construction details and the referenced Codes and Standards. All welds shall be touched up with a zinc-rich paint.

    c. Wire tying of components shall not be permitted.

15. Secure all required gussets, stiffeners, clips, straps, ties, bracing, etc., or accessories with self drilling attachments in accordance with the metal framing manufacturer's recommendations and standard construction details and as required by the referenced Codes and Standards.

E. Installation of Suspended Ceiling Framing:

1. General: Install in accordance with Chapter 47, Section 2504, Uniform

Building Code, 1997 edition, and as specified.

2. Main Runners: 1-1/2" cold-rolled or 1-1/2" hot-rolled steel furring channels. Spacing not to exceed 4'-0" on centers.

3. Main Runner Hangers: Specified prestraightened hanger wire in accordance with UBC Section 2504.3.

   a. For 1-1/2" cold-rolled channel: Minimum No. 8 gauge wire.

   b. For 1-1/2" hot-rolled channel: Minimum No. 8 gauge wire, except that No. 9 gauge wire may be used where the ceiling area supported by the hanger does not exceed 12.5 square feet.

   c. In accordance with UBC Table 25-A, for 1-1/2" cold-rolled channels spacing of hangers along each runner shall not exceed:

      (1) 4'-0" for runners spaced up to 3'-0" o.c.

      (2) 3'-6" for runners spaced 3'-1" to 3'-6" o.c.

      (3) 3'-0" for runners spaced 3'-7" to 4'-0" o.c.

   d. For 1-1/2" hot-rolled channels spacing of hangers along each runner shall not exceed 4'-0".

   e. Attachment of hangers shall be in accordance with UBC Section 2504.3.

      (1) At Main Runner: Saddle-tie lower end of wire hanger around main runner to develop the full strength of the hangers. Draw up taut and wrap at least 3 times around itself.

      (2) At Wood Framing: Threaded fasteners to suit in accordance to referenced Standards and Manufacturer's recommendations.

4. Cross furring shall be in accordance with UBC Section 2504.4.

   a. For Gypsum Wallboard: Use specified light gauge furring channel.

      (1) Typical Furring Space: 16" on centers, maximum, unless otherwise noted.

      (2) Other: Cross furring spaced at 24" o.c. maximum where

indicated, to be 1" furring channels.

b. Attachment of Furring: Saddle-tie cross furring at each runner with not less than one strand of No. 16 gauge or 2 strands of No. 18 gauge tie wire or an approved equivalent attachment method.

c. Splice connect ends of cross-furring by lapping and interlocking the pieces eight (8") inches minimum and tying near each end with double loops of No. 16 gauge wire.

5. Openings and Penetrations:

a. Provide furring around light fixtures, registers, pipe and duct penetrations, access panels and other openings and penetrations.

6. Bracing and Connections:

a. Provide all bracing for suspended framing, and all connections to building framing for furring runners and cross furring; all as indicated.

b. Lateral System:

(1) Seismic brace ceiling using #12 diagonal wires spaced on a 12' x 12' grid and within 4'-0" of walls. Seismic brace to be located at intersection of main runner and cross-furring member. Provide connection between diagonal wires and main runner so as to prevent slipping. 200# approximate seismic load.

c. Provide sets of four 12 ga. splayed bracing wires oriented 90 degrees from each other at the following spacing:

(1) Place sets of bracing wires at a spacing not more than 12 feet by 12 feet on center.

(2) Provide bracing wires at locations not more than 1/2 the spacings given above from each perimeter wall and at the edge of vertical ceiling offsets.

The slope of these wires should not exceed 45 degrees from the plane of the ceiling and should be taut without causing the ceiling to lift. Splices in bracing wires are not to be permitted without special Building Department approval.

7. Light Fixture Support:

   a. All recessed or drop-in light fixtures shall be supported directly by main runners or by supplemental framing which is supported by main runners.

   b. Surface mounted fixtures shall be attached to a main runner with a positive clamping device made of material with a minimum of 14 gauge. Rotational spring catches do not comply.

8. Wall Angles: Where required by code provide 1-1/2" cold rolled or hot rolled wall angles. Secure to solid backing with No. 8 x 2-1/4" pan head sheet metal screw. Secure cross furring or main runners to angle with pop rivets.

F. Sound Partitions: At all sound partitions, set floor runners in two 1/4" diameter continuous beads of acoustical caulking. Provide products as described under Section 09 25 00 - Gypsum Wallboard and Section 07 92 00 - Sealants and Caulkings.

G. Diagonal Wall Bracing: Diagonally brace ceiling height metal stud walls constructed with 4 inch or less wide studs and not exceeding 10'-2" in height at 4'-0" o.c. to the structure above when unbraced length of wall exceeds 8'-0". Construct bracing as detailed on the Drawings.

1. Provide diagonal bracing for walls constructed with studs greater than 4 inches wide or exceeding 10'-2" in height at locations as indicated on the Drawings. Construct bracing as detailed on the Drawing.

2. Place studs in walls under diagonal bracing to resist the vertical components.

H. Furring:

1. Size and install furring in accordance with the "Standards" hereinbefore specified.

2. Spacing of furring for gypsum wallboard and gypsum lath shall not exceed 16 inches on centers.

3. Spacing of furring shall not exceed that required for the types of plaster bases to be used. Verify types of plaster bases to be used and the maximum spacing of supports required at various locations.

4. Light gauge furring channels shall not be used to support metal lath plaster bases.

3.04 INSTALLATION OF METAL BACKING

A. Securely attach backing plates to metal framing across a minimum of three (3) studs or other framing members.

1. Where screwable studs are available, attach with at least (3) three 5/8" low profile head sheet metal screws equal to USG Type S-12 Low Profile Head Screws at each stud.

2. Where screwable studs are not available, attach backing plates by welding in accordance with metal framing system manufacturer's recommendations and standard construction details and the referenced Codes and Standards.

B. Notify the Architect at the completion of installation of metal backing plates and prior to installation of any work which would conceal the backing plates or their attachment to the metal framing work.

3.05 ANCHOR VALUES AND TESTING REQUIREMENTS

A. Anchor Load Table:

DIA.	EMBED.	TENSION WITH SPECIAL INSPECT.	TEST LOAD	SHEAR
Hilti Kwik-Bolt Anchor				ICBO Report No. 2156
1/4"	1-1/4"	225#	360#	380#
1/4"	2-1/2"	645#	1032#	380#
3/8"	1-5/8"	516#	826#	860#
3/8"	3-1/2"	785#	1256#	870#
1/2"	2-3/4"	1320#	2128#	1710#
1/2"	4-1/2"	1670#	2672#	1710#
Hilti Drop-In Anchor			ICBO Report No. 2895	
3/8"	1-5/8"	795#	1271#	975#
1/2"	2"	1000#	1600#	1470#
5/8"	3-1/2"	1440#	2304#	2570#
5/8"	5-1/2"	1740#	2784#	3070#

B. Actual loads on anchors are not to exceed 80% of the tension and shear values listed above.

C. Test load values are 80% of twice the tension and shear values listed above.

D. 20% of the expansion anchors on each job may be proof load tested to twice 80% of the ICBO recommended allowable load in tension for that particular anchor except that if the design load is less than 75 pounds, only one anchor in ten need be tested. If any anchor fails, then test all anchors.

1. Costs for initial testing are to be fully borne by the Owner.

2. Costs for additional testing or retesting as a result of failure of an anchor during initial testing are to be fully borne by the Contractor. The Contract Amount will be adjusted by Change Order, in accordance with the Conditions of the Contract, to reflect any costs incurred by the Owner resulting from additional testing or retesting due to anchor failure.

3.06 PROTECTION

A. Protect work and materials of this Section prior to and during installation and protect the installed work and materials of other trades.

B. In the event of damage immediately make all repairs and replacements necessary to the approval of the Architect and at no additional cost to the Owner.

END OF SECTION

This page intentionally left blank

SECTION 09 25 00 – GYPSUM WALLBOARD

PART 1 – GENERAL

1.01 SCOPE

A. Provide all gypsum wallboard work, including, but not limited to trims and accessories.

B. Coordinate surface finish treatments with other trades.

C. Provide spray texturing of wall and ceiling surfaces to match existing and receive new finishes as scheduled.

D. Provide refinishing of existing wall and ceiling surfaces at existing areas adjacent to and affected by new work.

1.02 RELATED WORK

A. Section 07 92 00: Sealants and Caulkings.

B. Section 09 90 00: Painting.

1.03 SUBMITTALS

A. Refer to Section 01 30 00 - SUBMITTALS.

B. Material list: Submit list of all products proposed for use.

C. Sample panel: Lay up 3' x 3' sample panel of each system wallboard finish under Architect's supervision. Do not proceed until samples have been approved. Sample shall include a tape joint, fastener cover, all toppings and coatings, spray finish textures and/or paint finishes of semi-gloss paints.

1.34 QUALITY ASSURANCE

A. Fire-resistance ratings: Where work is indicated for fire-resistance ratings, including those required to comply with governing regulations, provide materials and installations identical with applicable assemblies which have been tested and listed by recognized authorities, including UL and UBC.

B. Industry standard: Comply with applicable requirements of GA-216 "Application and Finishing of Gypsum Board" by Gypsum Association, except where more detailed or more stringent requirements are indicated, including recommendations of manufacturer.

C. Allowable tolerances: 1/8-inch offsets between planes of board faces and 1/4 inch in 8 feet for plumb, level, warp, and bow.

D. Manufacturer: Obtain gypsum boards, trim accessories, sealers, primers, top coatings, adhesives, and joint treatment products from single manufacturer, or from manufacturers recommended by prime manufacturer of gypsum board.

1.05 PRODUCT HANDLING

Deliver materials in original packages, containers, and bundles, bearing manufacturer's label and brand. Neatly stack materials flat, taking care to avoid undue sagging or damage to board surface or edges. Keep materials dry and, if stored outside, stacked off ground on level platform fully protected from weather.

1.06 ENVIRONMENTAL CONDITIONS

Do not install wallboard or joint compounds if building temperature is below 55 degrees F or if proper ventilation is not provided to eliminate excessive moisture from building.

PART 2 - PRODUCT

2.01 MATERIALS

A. Gypsum Boards:

1. Gypsum Wallboard Type 1: Regular Gypsum Wallboard, ASTM C-36, Fed. Spec. SS-L-30D, Type III, Grade R and ANSI A69.1; USG Sheetrock SW, Domtar Gyproc Regular, Gold Bond Sta-Smooth, or approved equal; beveled tapered edge, 5/8-inch thickness unless otherwise indicated.

   a. Use typically unless otherwise indicated.

2. Gypsum Wallboard Type 2: Fire Resistant Type "X" Gypsum Wallboard: Fed. Spec. SS-L-30D, Type III, Grade X and ANSI A69.1; ASTM C-36, USG Sheetrock Fire code "C"-SW, Gold Bond Fire-Shield Sta-Smooth, Domtar Gyproc Fireguard Type X, or approved equal; Type "X", beveled tapered edge, 5/8-inch (15.9mm) thickness unless otherwise indicated.

   a. Use on fire rated walls and other locations as noted, or in lieu of Type 1

3. Exterior Gypsum Sheathing, ASTM C-29, Fed. Spec. SS-L-30D, Type II, Grade X & W and ANSI A69.1; USG Sheathing, Gold Bond Gypsum Sheathing, or approved equal. Type X & W, T & G 1/2" asphalted core, water-repellent paper surface both sides unless otherwise indicated. Use at

exterior walls and at locations as indicated.

a. Use at areas of exterior infill.

4. Gypsum Wallboard Type 3: Water Resistant Type "X" Gypsum Wallboard, ASTM 630, Fed. Spec. SS-L-30D, Type VII, Grade WX and ANSI A69.1; USG Sheetrock Fire code "C", Gold Bond MR Fire shield, Domtar Gyproc Moisture-Guard Type X, or approved equal; moisture resistant board, Type "X", tapered 5/8-inch (15.9mm) thickness unless otherwise indicated.

a. Use on fire rated walls and ceiling at restrooms, toilet rooms and other locations as noted.

5. Gypsum Wallboard Type 4: Water Resistant Gypsum Wallboard, ASTM 630, Fed. Spec. SS-L-30D, Type VII, Grade R and W, Type WR ANSI A69.1; USG Sheetrock, Gold Bond MR, Domtar Gyproc Moisture-Guard, or approved equal; moisture resistant board, 5/8-inch (15.9mm) thickness unless otherwise indicated.

a. Use on walls and ceilings at toilet rooms.

B. Trim accessories: Manufacturer's standard galvanized steel units, including beads, edge trim, and casings. Provide expansion joints at exterior soffits.

C. Furring channels: Roll-formed, hat-shaped sections as indicated in Drawings; 26 ga. galvanized steel.

D. Joint treatment materials: Tape and joint compounds, ASTM C475; type recommended by manufacturer for application indicated, except as otherwise noted.

E. Miscellaneous materials: Provide auxiliary materials for gypsum drywall work of type and grade recommended by manufacturer of gypsum board.

1. Laminating adhesive: Special adhesive or joint compound specifically recommended for laminating gypsum boards.

2. Acoustical sealant: Highly elastic, water-based compound, specifically formulated for acoustical sealing. Non-bleeding, non-staining, pumpable and easily applied in beads.

3. Sealer, primer, top coatings in accordance with gypsum board manufacturer's recommendation to prepare surface to receive the specified paint finishes.

F. Gypsum board fasteners: Comply with GA-216 and UBC Table 25-G.

1. Metal supports: Special flathead Phillips self drilling, sheet metal type, rust inhibitive coated screws for use with power driven tool.

G. Texture Primer: Flat Paint or Flat White Pigmented Shellac per wallboard and texture manufacturer's recommendations.

H. Wall and Ceiling Texture, for use on all gypsum wallboard that is to be painted unless scheduled otherwise: USG Spray Texture, Gold Bond Wall Spray Texture, Domtar Wall and Ceiling Spray Texture, or equal. Asbestos-free wall texture with no aggregates applied to a spray finish texture to be overcoated with paint.

PART 3 - EXECUTION

3.01 SURFACE CONDITIONS

Correct unacceptable sub-surfaces before proceeding with installation. Starting of work will indicate acceptance of such surfaces.

3.02 COORDINATION

Coordinate work to avoid delays and interference with work of mechanical, electrical, and other trades.

3.03 INSTALLATION

A. Fire-resistive ratings: Where fire rated construction is indicated, install wallboard assembly to provide fire-resistive rating required.

B. Sheet arrangement layout: Conform to layouts and requirements indicated; use long sheets to restrict joints to minimum.

C. Joints: Butt sheets loosely together with tapered edges always placed together. Sand or kerf cut edges and mill ends to provide smooth jointing on exposed face. Stagger end joints.

D. Fasteners: Place fasteners 3/8 inch from edges of boards, except when using washers or clips with fasteners in joint. Install fasteners with heads dimpled slightly below surface; do not cut through paper. Space fasteners in accordance with GA-216 and manufacturer's recommendations, except as otherwise required by CBC.

E. Ceilings: Place boards with long dimensions at right angles to supports and end joints occurring over supports. Place perimeters of ceilings and edges of openings over solid bearing members.

F. Partitions: Place boards with long dimension either vertical or horizontal (but not combination of both) on studs. Stagger joints on opposite sides of partitions. Locate joints at least 12 inches from jambs of openings. Keep end joints to minimum.

G. Caulking: Using double bead of specified material, install at floors, wall intersections, where walls abut other materials and at all electrical boxes. Install wherever caulking material is indicated in connection with wallboards. Apply in accordance with manufacturer's printed directions.

H. Cutting and Scribing: Cut neatly to fit around outlets, switch boxes and other protrusions, using keyhole saw or specially designed cutting tool for opening of exact shape and size needed.

I. Trim: Edge exterior corners with bead set to true, plumb line. Where wallboard joins or abuts any material other than wallboard, cover end of board with metal casing, leaving joint sufficient for installation of caulking.

J. Acoustical sealant: Place acoustical sealant within partitions in accordance with manufacturer's recommendations. Install acoustical sealant at gypsum board perimeter at acoustical insulated partitions at:

1. Base layer of double layer applications.

2. Face layers of acoustical insulated partitions.

Caulk all penetrations of partitions by conduit, pipe, ductwork, rough-in boxes, and similar items.

3.04 TAPING AND FINISHING

A. Environmental Conditions: Control heating and ventilating during finishing operations to ensure the maintenance of 55 degrees F minimum temperature.

B. Finish all joints, screw and nail head depressions, applied metal trim and surface blemishes, applying tape and compounds in strict accord with manufacturer's printed directions.

C. Level 5 joint treatment typical.

D. First Coat:

1. Spread compound evenly over all joints, using suitable tools designed for the purpose.

2. Fill all joint recesses and metal trim.

3. Center the reinforcing tape on the joint and press into the fresh compound, wiping down with sufficient pressure to remove excess compound but leaving sufficient compound under the tape for proper bond.

4. Feather all edges and leave the surface free from blisters and tape wrinkles.

5. Apply compound to all fastener recesses, leaving flush with the adjacent surfaces.

6. Fold reinforcing tape along its centerline and apply to all interior angles, following the same procedure as for joints.

D. Second Coat:

1. Lightly sand the dry compound with fine sandpaper to remove all irregularities.

2. Apply a second coat of compound to all joints, feathering approximately three inches beyond edges of tape.

3. Apply second coat to all fastener recesses; allow to dry.

E. Third Coat:

1. Lightly sand the dry compound with fine sandpaper to remove all irregularities

2. Apply a final skim coat, feathering out approximately two inches beyond second coat.

3. Third coat all fastener recesses and metal trim, and all interior angles; allow to dry.

F. Spray Texture Coat: At all exposed gypsum wallboard surfaces except where surfaces are scheduled or specified for stipple paint or finish other than paint.

1. When machine applied spray texture coat is used, the third coat described above may be omitted provided all irregularities in gypsum wallboard are completely obliterated by the finished texture coat.

2. Unless otherwise specified or scheduled, apply the single-coat spray texture coat to all surfaces in a degree of texture approved by the Architect to match approved sample.

3. Where gypsum wallboard will be concealed above ceilings, etc., and where it will be covered by rigid material such as ceramic tile, wainscots, etc., finish coats of topping compound may be omitted.

4. Finish Texture: Spray texture shall be as follows:

   a. Walls: to match existing.

   b. Ceilings: Light to match existing.

5. Provide spray texture to existing walls and ceilings adjacent to and affected by new work. Provide texture to nearest corner, transition, or brake point.

F. "Smooth" finish: Where smooth finish is called for on the Drawings, and where no other surface finishing is called for on the Drawings, carefully sand the third coat to a uniformly smooth surface completely free from irregularities visible at a distance of five feet.

3.05 CLEAN-UP

Remove empty containers, scraps of material and other debris, and leave premises broom clean. Clean adjoining work spotted or otherwise defaced by work of this Section.

-END OF SECTION-

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 09 30 00 - TILE

PART 1 – GENERAL

1.01 SCOPE

A. Provide all labor and materials necessary for ceramic wall, floor and base tile as indicated on the Drawings and specified here and as required to accommodate the new construction.

B. Level and fill subfloor as required to accommodate new tile work.

1.02 RELATED WORK

A. Section 09 25 00: Gypsum Wallboard.

1.03 SUBMITTALS

A. Refer to Section 01 30 00.

B. List of materials: Submit complete listing of all materials proposed for use, with manufacturer's data. Indicate location of each.

C. Certification: Furnish manufacturer's "Master Grade Certificate" bearing Tile Council of America (TCA) certification mark for all tiles.

D. Samples: Submit manufacturer's complete range for color and pattern selection.

E. Sample panel: Lay up 3' x 3' sample panel of each tile under Architect's supervision. Do not proceed until samples have been approved.

1.04 PRODUCT HANDLING

Deliver all materials to job site in original labeled, unopened containers. Protect from moisture and dampness.

1.05 PROTECTION

A. Barricade and prevent traffic in all tile areas during installation and curing period.

B. Protect other surfaces or materials from damage.

1.06 EXTRA STOCK

Provide extra stock of 5 percent of each tile in each color for future needs of Owner. Extra

to be from same batch as those actually installed.

PART 2 – PRODUCTS

2.01 SCHEDULED MANUFACTURERS/SUPPLIERS

A. Dal Tile (specified)

B. Arizona Tile or Equivalent

C. No Substitutions permitted.

2.02 MATERIALS; PORCELAIN CERAMIC FLOOR TILE (Refer to Finish Schedule on the Drawings)

A. Ceramic Wall Tile:

1. Glazed interior wall tile: 1/4" thick, nominal dimensions.

   a. Dal Tile: Glazed ceramic mosaics tile with colors as scheduled on the Drawings.

   b. Arizona Tile: Equal to specified product.

   c. Or equal.

2. Pattern and Color Groups:

   a. Ceramic wall tile shall consist of two patterned color groups with two colors per group in patterns as indicated on the Drawings. Field color and one row of horizontal accent tiles.

   b. Radius edge at horizontal and vertical terminus points.

B. Ceramic Base Tile:

1. Porcelain glazed ceramic mosaic base tile shall be ¼ inch thick, nominal dimensions porcelain ceramic mosaic wall tile as scheduled on the Drawings. Less than one half of one percent absorption.

   a. Color patterns, groups and products to match glazed porcelain ceramic mosaic wall tile as specified herein and as indicated on the Drawings.

   b. square edge top where abuts to wall tile.

C. Ceramic Mosaic Floor Tile:

1. Unglazed, cushion edge, dust pressed, integral color, non-slip textures, 2 inch (5cm) x 2 inch (5cm) x 1/4 (6.4mm) inch thick, nominal dimensions. Less than one half of one percent of absorption.

a. Dal Tile Corporation "Keystone": Porcelain ceramic mosaic tile with cushion edge. Colors as selected by the Architect from Price Group 1 and 2.

(1) Slip resistant abrasive grain.

b. Arizona Tile: Porcelain ceramic mosaic tile with cushion edge Colors as selected by the Architect from Price Group 3.

(1) Slip resistant abrasive grain.

c. Or equal.

2. Pattern and Color Groups: Ceramic mosaic floor tile shall consist of two-color groups with one color per group.

2.03 MISCELLANEOUS TILE MATERIALS

A. Special Shapes and Trim Shapes: Provide as shown or required for a complete installation of tile work. Special shapes provided shall include special corners, caps, stops, returns, trimmers, curb tiles, coved shapes, etc. Provide surface bull nose at exposed edges where tile abuts dissimilar material.

2.04 MIXES (parts by volume)

A. Grout (light colors): 1-part white cement mixed with 1 part fine white sand and elastomeric latex additive recommended by manufacturer as suitable for this purpose. Color with mineral oxides for color selected by Architect to match existing.

B. Grout (dark colors): 1 part gray cement mixed with 1-part fine sand and 1-part Anti-Hydro to each 10 parts water. Color with mineral oxides for dark color selected by Architect to match existing.

C. Factory mixed grouts will be considered as equivalent to custom mixed grouts if colors available for selection by the Architect are from standard and optional/designer ranges of available colors and in the opinion of the Architect, they match the existing colors.

2.07 SETTING MATERIALS

A. Grouts:

1. Ceramic Mosaic Tile Grout: Bostik, "Hydroment Ceramic Tile Grout and Joint Filler", Mapei "Keracolor Floor Portland Cement Grout", Laticrete "Floor Grout and Joint Filler", or approved equal latex amended, sanded grout and joint filler. Color as selected from manufacturer's full range of standard and designer (Grade II) colors including white.

2. Glazed Ceramic Wall Tile Grout: Bostik "Hydroment Dry Tile Grout", Mapei "Keracolor Dry Tile Grout", Laticrete "Dry Set Wall Grout", or approved equal unsanded mildew resistant latex amended grout for use in joints 1/8" (3.2mm) wide or smaller. Color as selected from manufacturer's full range of standard and designer (Grade II) colors including white.

B. Expansion/control joint backing material: Provide closed cell polyethylene foam weighing not less than 2.7 lbs, per cu. ft., and in dimension approximately 20% thicker than width of the expansion joint in which used.

C. Expansion/control joint sealant: Provide in colors selected by the Architect.

1. At joints between floors and walls, and at perimeter of metal door frames, provide mildew resistant one-part silicone material equal to Dow Corning "786".

2. At joints in traffic areas, and at perimeter joints, provide two-part polyurethane material with Shore A hardness of 35-45.

D. Water: Clean and potable.

E. Portland cement complying with ASTM C-150, Type I and II.

F. Sand complying with C-144.

G. Latex Additives:

1. Bonding Coat: Laticrete 4237, Mapei Keracrete, Bostik Hydroment Upco-crete, or approved equal.

2. Grout Additive: Laticrete 3701, Mapei Plastijoints, Bostik Hydroment Acrylic Latex, or approved equal.

3. Leveling Coat: Laticrete 3701, Mapei Planicrete 50, Bostik Hydroment Upco-crete, or approved equal additive.

H. Cleaning Materials:

1. Acid Solution for Cleaning Unglazed Mosaic Units: 1-part hydrochloric acid (muriatic) in 10 parts of clean water and in accordance with the manufacturer's recommendations.

2. Cleaning materials for glazed tiles as per tile manufacturer's recommendations.

I. Sealer: Over all the grout joints and unglazed tile work of this Section, provide a sealer listed in the "Tested Materials" list of the Ceramic Tile Institute, and applied in strict accordance with the manufacturer's recommendations.

K. Provide all additional materials and accessories required for a complete installation. Provide as required or recommended by manufacturer's instructions or referenced standards.

2.08 INSTALLATION MATERIALS

A. Cleavage membrane/moisture barrier: Where indicated on the Drawings, and elsewhere as required for cleavage to prevent penetration of small amounts of water, provide a system using 0.004" (.1mm) thick polyethylene sheeting complying with ASTM D2103, or 15 lb. (6.8kg) asphalt-saturated felt complying with ASTM D226, or a similar system approved in advance by the Architect.

B. Edge strips: Design as required for the condition of use, and fabricate from Type 302 stainless steel unless other material has been approved in advance by the Architect.

PART 3 - EXECUTION

3.01 WORKMANSHIP AND INSTALLATION STANDARDS

A. Comply with TCA "Handbook for Ceramic Tile Installation", latest edition at time of bid opening, for applicable substrate conditions.

B. Prior to installation of the work of this Section, carefully inspect and verify that the installed work of other trades is complete to the point where this installation may properly commence.

C. Examine surfaces to receive tile.

1. Surfaces shall be free of dust, dirt, grease, paint, and other foreign manner which would affect adequate bond.

3. Concrete floor substrate shall be sufficiently rough to provide adequate mortar bond. Substrate shall be pitched to drains. In no case will variation in substrate of more than 1/8 inch (3.7mm) in 10 feet (3.1m) at thin set and 1/4 inch (6.3mm) in 10 feet (3.1m) for mortar set be acceptable.

D. Verify that specified items may be installed in accordance with the approved design.

E. In the event of discrepancy, immediately notify Contractor. Do not proceed in discrepant areas until discrepancies have been fully resolved.

F. Starting of work on any surface shall constitute unqualified acceptance of that surface as being satisfactory for tile work.

3.02 INSTALLATION

A. General:

1. Comply with pertinent provisions of the referenced standards, except as otherwise directed by the Architect or specified herein.

2. Maintain minimum temperature limits and installation practices recommended by materials manufacturers.

3. Do not install tile floors over membrane until the membrane has been tested and accepted.

4. Mix and use proprietary materials in strict accordance with the manufacturers' printed instructions.

5. Prepare the surfaces, set, fit, grout, and clean the work of this Section in strict accordance with the referenced standards and the manufacturers' recommendations.

6. Barricade traffic over new surfaces or provide approved walkways.

7. Provide leveling coat at existing sloped floor as required. Patch with epoxy floor fill.

B. Install in accordance with pertinent provisions of the standards listed under "Quality Assurance" in Part One of this Section, pressing and beating tile into place to obtain 100% coverage by mortar on the back of each tile. Back-butter the tiles if necessary to achieve 100% coverage.

C. Comply with ANSI standard installation specifications A-108.1 through A-108.10 and the Tile Council of America "Handbook for Ceramic Tile Installation", except as specified otherwise here.

D. Installation Requirements and Methods for Setting Bed Types as follows:

1. SB-1: Use latex-portland cement mortar bond coat over existing concrete floor for floor; comply with the applicable requirements of ANSI A-118.4, A-118.6, A-108.5 and A-108.10 TCA Handbook method F-112.

2. SB-2: Use latex-portland cement mortar bond coat for wall tile and base; comply with the applicable requirements of ANSI A-118.4, A-118.6, A-108.5 and A-108.10, TCA Handbook method W243 at gypsum wallboard over wood or metal studs.

E. Bond coats:

1. Latex-portland cement mortar bond coat shall be 1:3 portland cement/sand gauged with Laticrete 4237, Mapei Keracrete, Bostik Hydroment Upco-crete or approved equal latex admix.

2. Epoxy bond coat shall be prepared in accordance with the referenced standards and the manufacturer's recommendations and gauged with Bostik "Hydroment 1900", Laticrete "Latapoxy 210", Custom "Epoxy Crete", or approved equal additive.or approved equal epoxy admix.

F. Limits of tile:

1. Extend tile into recesses and under equipment and fixtures to form a complete covering without interruptions.

2. Terminate tile neatly at obstructions, edges, and corners, without disruption of pattern or joint alignment.

G. Joining pattern: Match existing.

H. Joint width: Match existing.

I. Cut and drill tile for proper fit around fixtures and equipment in place; rub down exposed sharp edges of cuts with abrasive stone. Fit tile closely around outlets, pipes, fixtures, and fittings so that plates, escutcheons and collars will cover cuts. Grind and fit carefully at intersections and against trim, built-in fixtures, and accessories.

J. Allowable variations in finished work: Do not exceed the following deviations from

level and plumb, and from elevations, locations, slopes, and alignments shown:

1. Horizontal surfaces: 1/8" (3.2mm) in ten ft. (3.1m) in all directions.

K. Tile that is broken, chipped, marred, or is otherwise damaged; tile that is not firmly bonded; tile that is improperly fitted and tile that has poorly finished cut edges; tile work that does not comply with the referenced standards shall be replaced promptly without additional cost to Owner.

L. Neutralize and seal substrates in accord with adhesive manufacturer's instructions.

M. Unglazed tile shall be factory waxed or, when approved by the Architect, be field treated with grout release sealer prior to installation.

3.03 EXPANSION/CONTROL JOINTS

A. Match Existing.

3.05 GROUTING

A. General:

1. Do not begin grouting floor or wall tiles until they are firmly set and, in no case, in less than 48 hours after they have been installed.

2. Remove spacers, ropes, glue, and similar foreign matter prior to grouting.

3. When using proprietary grout, adhere strictly to the manufacturer's directions unless otherwise specified or approved in advance by the Architect.

B. Installation:

1. Mix grout by hand or with a slow-speed drill motor not exceeding 300 rpm, achieving a stiff non-slumping consistency, and using the minimum amount of liquid to achieve a workable mix.

2. Force the maximum amount of the approved grout into joints in accordance with pertinent recommendations contained in ANSI A-108.10.

3. Fill the joints of cushion-edge tile to depth of the cushion; fill joints of square-edge tile flush with the surface.

4. Fill all gaps and skips.

a. Do not permit mortar or mounting mesh to show through grouted

joints.

b. Provide hard finished grout, which is uniform in color, smooth, and without voids, pin holes, or low spots.

c. Leave tile clean.

3.06 CLEANING, POLISHING AND SEALING

A. After completion of setting and grout, thoroughly clean and polish the tile.

1. Do not use acid or acid cleaners to clean tile.
2. When the tile is thoroughly clean and dry, polish glazed tile with clean dry cloths.

B. Apply sealer to all grout joints and unglazed tile work of this Section in accordance with the manufacturer's recommendations and referenced standards.

3.07 CURING

A. Damp cure all tile installation, including Portland cement grouts, for 72 hours minimum.

1. Cover with 40 lb. kraft paper.
2. Do not use polyethylene sheets directly over tile in horizontal surfaces.

308 PROTECTION

A. Protect tile materials after installation to prevent damage and wear.

B. In the event of damage, make all repairs and replacements necessary to the approval of the Architect at no additional cost to the Owner.

3.09 CLEANING AND REPAIRING

A. After installation sponge and wash tile thoroughly, then wipe with damp cloths and polish with dry cloths. Cleaning solutions shall be in accordance with the specified standards and the tile manufacturer's recommendations.

B. Leave finished installation clean, free of cracked, chipped, broken, unbonded, or otherwise defective tile work. Remove and replace as directed.

END OF SECTION

SECTION 09 65 00 – RESILIENT FLOORING AND BASE

PART 1 – GENERAL

1.01 SCOPE

A. Provide resilient base as shown on Drawings and specified here.

B. Provide all substrate preparation including cleaning, testing and the application of sealers or coatings as required for a complete and proper installation of resilient flooring materials.

1.02 RELATED WORK

A Section 09 25 00: Gypsum wallboard.

1.03 SUBMITTALS

A. Refer to Section 01 30 00.

B. Manufacturer's data: Submit list of all products proposed for use including flooring, base, adhesive and cleaners.

C. Samples: Submit samples for pattern and color selection by Architect.

D. Maintenance manual: Provide complete printed instructions on maintenance and care of installed resilient flooring and base for inclusion in maintenance manual for Owner.

1.04 PRODUCT HANDLING

A. Delivery: Deliver materials to building site in manufacturer's labeled, unbroken containers.

B. Storage: Protect from dampness, soiling and injury.

1.05 ENVIRONMENTAL CONDITIONS

A. Do not install materials unless ambient temperature of 70 degrees F is maintained 24 hours prior to and during laying and until all materials have been stored at site for 24 hours at that temperature.

B. Do not apply materials on wet or damp surfaces.

C. Defer laying until other work that might cause damage to flooring has been completed.

1.06 EXTRA STOCK

A. Provide two extra cartons of tile of each color for future needs of Owner. Extra to be from same batch as those actually installed.

B. Provide one box-extra of base same as that installed and one box outside pre-formed corners.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Rubber base: FS SS-W-40, Type I, 4-inch-high top-set rubber base to match existing; Burke or approved equal. Colors and patterns from product as scheduled on the drawings. Provide cove base for resilient flooring. Use preformed end stops, inside corners and exterior corners.

B. Adhesives, Primers, and Sealers: Moisture and alkali resistant, as recommended by flooring or base manufacturer as applicable for particular material and installation condition; precede with primer recommended by flooring or base material manufacturer.

2.02 EDGING REDUCER STRIPS AND VINYL ACCESSORIES

Rubber reducer strips, color as selected, same thickness as adjacent resilient flooring material. Mercer Plastic Company, Roppe Rubber Company, Flexco Company or approved equal.

2.03 JOINT FILLER, NEUTRAL CLEANER

Type made or recommended by floor covering manufacturer for conditions of installation.

2.04 OTHER MATERIALS

A. All other materials, including adhesives, not specifically described but required for a complete and proper installation of resilient flooring, shall be only as recommended by the manufacturer of the material to which it is applied, and shall be subject to the approval of the Architect.

PART 3 - EXECUTION

3.01 CONDITION OF SURFACES

A. Examine substrate and conditions under which work is to be performed. Surfaces must be broom-clean, free of coatings that would impair adhesion, smooth and level with no more than 1/8 inch in 10 feet variation from level. Do not proceed until unsatisfactory conditions have been corrected.

B. Beginning of installation will imply acceptance of surface by installer.

3.02 ADHESIVE APPLICATION

Follow adhesive manufacturer's directions for mixing and applying. Cover surface evenly. Do not exceed working area or time limits recommended by manufacturer.

3.03 INSTALLATION

A. General: Install materials in strict compliance with detailed instructions issued by manufacturer of material, considering the use of "should" as indicating mandatory requirements. Work of all other trades, including painting, shall be substantially completed before start of laying flooring and permanent heating system must be in operation. Adulteration or reducing of adhesives will not be allowed. Where different colored materials occur in adjoining rooms or spaces, make color change on a line centering, under door when closed.

B. Seamless Membrane Flooring:

1. Install seamless flooring in accordance with the manufacturer's printed instructions, hot-air welding seams, and trimming.

2. Install cap strip.

3. Upon completion of installation, flooring and seams shall be flat and smooth, with no voids between welds and adjacent flooring.

C. Reducer Strips”

1. Apply adhesive and bond securely to substrate in straight, true lines.

2. Provide where floor covering terminates exposing the edge of the covering.

3. Center edge strips under doors where floor covering terminates at a door opening.

4. Cut ends to fit edges of door frames and abutting surfaces; fit edges to adjoining floor coverings.

5. Top of strips shall be flush with top of resilient flooring material.

D. Resilient Base: Adhesive apply. Use extreme care not to spread adhesive above top of base. Base material shorter than 12" in length shall not be used. Scribe accurately to door trim. Do not install base until backing material is thoroughly dry. Where voids are found to exist at top of base because of wall irregularities, fill neatly flush to top of base. Install base so as to obtain full adhesion to the backing over 100% of base contact surface.

1. Apply base in accordance with base manufacturer's printed directions.

2. Set straight and level, joints closely fitted and flush, top and bottom edges in firm, full contact with floor and wall, and entire backside bonded to wall.

3. Exercise care to prevent staining of adjacent surfaces.

3.04 CLEANING AND FINISHING

A. Remove all scraps, cartons, cans and debris from job site.

B. Maintain traffic control until 5 days after installation.

C. Clean all resilient flooring materials thoroughly and apply wax or finishing material in accordance with manufacturer's recommendations. Polish thoroughly. Delay cleaning and finishing until just prior to occupancy by Owner.

3.05 EXTRA STOCK

A. Furnish three unopened boxes of floor tile from same lot as used in work. Mark boxes with manufacturer's name, color pattern and label "Surplus for Repairs".

B. Furnish two 36" x 36" rolled swatches of each color of membrane flooring. Tag with manufacturer's name, color pattern and label "Surplus for Repairs".

END OF SECTION

THIS PAGE INTENTIONALLY LEFT BLANK

PART 1 - GENERAL

1.01 SCOPE

A. Provide all carpeting and accessories complete, in place, as indicated on Drawings and specified here.

B. Perform calcium hydration moisture tests on slab.

1.02 RELATED WORK

Section 09650: Resilient Flooring (Bases and transition pieces).

1.03 QUALITY ASSURANCE

A. General: Carpet installer must be approved by carpet manufacturer and Architect. Disapproval by either agent will result in the Contractor supplying additional installer names until conditions of full approval are met, all at no additional cost to Owner or increase in bid price.

B. As a standard of quality, carpet shall equal or exceed quality of manufacturer specified.

C. Equivalent carpet of other manufacturers may be used, provided it complies with requirements specified and is equal, in Architect's opinion, in quality, materials, dying method, colors and color range selection, appearance and performance to carpet specified.

D. Provide manufacturer's certification that carpet (identified by mill registration numbers) is in compliance with Contract Documents stating quantity and materials used.

E. When, in opinion of Architect, testing of carpet is necessary to determine compliance with Contract Documents, samples shall be taken as directed, and dissected and analyzed by a qualified testing laboratory selected by the Owner. Costs of such testing, if required, shall be fully borne by the Contractor and not be reimbursed.

1.04 SUBMITTALS

A. Make submittals in accordance with Section 01 30 00.

1. Product data. Submittal required.

2. Manufacturer's installation instructions upon Architect's request only.

3. Non-specified products must be pre-approved prior to bidding.

4. Maintenance Manual (Refer to Section 01 78 00).

5. Seam Diagram. Submittal required.

1.05 DELIVERY, STORAGE AND HANDLING

Deliver all carpet in original mill wrappings with each roll having register number tags or stenciled on bale and intact. Store under cover in well ventilated spaces as soon as delivered, secure from damage, dirt, stains, and moisture.

1.06 PROJECT CONDITIONS

Maintain spaces to receive carpeting at 70 degrees F minimum at floor level for 48 hours previous to, during, and for 48 hours after installation of carpets.

1.07 WARRANTY

Provide manufacturer's standard ten (10) year warranty for less than 15% loss of pile fiber due to excessive surface wear.

PART 2 - PRODUCTS

2.01 CARPET

A. Carpet: Provide new. As a standard of quality, carpet shall meet the following minimum characteristics:

1. Acceptable Manufacturers and Carpets:
   a. TBD
   b. No known Equivalents
   c. No known equal.

2. Product: TBD
   a. Construction: TBD
   b. Texture: TBD
   c. Fiber: TBD
   d. Gauge: TBD
   e. Stitches per inch: TBD
   f. Pile Height: TBD

g. Face Weight: TBD
h. Dye Method: Solution Dyed
i. Unitary Back: Required, Tuff Bind 20 pounds, average dry or wet.
j. Primary Backing: Woven Synthetic
k. Secondary Backing: Woven Synthetic
l. Roll Width: 12 feet
m. Average Density: TBD
n. Static Control: Required less than 3.0 kv. when tested in accordance with AATCC-135 at 70 degrees F., 20% R.H.
o. Anti-Microbial Protection: Required.
p. Stain Resistant Treatment: Factory applied, Scotch Guard or equal.
q. Flammability:
   (1) Methanamine Pill Test (DOC FF #1-70): Passes.
   (2) Floor Radiant Panel Test (ASTM E648): Class 1 (Exceeds .45 watts/cm to the second power Critical Radiant Flux) - Direct Glue Down.
r. Smoke Density (ASTM E662): 450 or less.
s. Color: As selected unless otherwise indicated
t. Installation: Direct Glue Down.

2.02 ACCESSORIES

A. Carpet Trim Strips: Extruded vinyl equal to products as manufactured by Mercer Plastic Company, the Johnson Rubber Company, or approved equal as shown on the Drawings, or as selected by the Architect to suit conditions. Colors shall be as selected by the Architect from manufacturer's full range.

B. Carpet Adhesive: As recommended by carpet manufacturer.

C. Seam Adhesive: As recommended by carpet manufacturer.

D. Floor Underlayment: Webtex 60 or 90, Vitex or approved equal for correcting irregularities in concrete floor surfaces.

E. Miscellaneous Materials: Provide types of seaming tape, thread nails, adhesives, mat fasteners, and other items recommended by carpet manufacturer and installer for the conditions of installation and use.

PART 3 - EXECUTION

3.01 INSPECTION

A. Prior to installation of the work of this Section, carefully inspect and verify that the work of other trades is complete to the point where this installation may properly commence.

B. Verify that specified items may be installed in accordance with the approved design.

C. In the event of discrepancy, immediately notify the Contractor. Do not proceed in discrepant areas until discrepancies have been fully resolved.

D. Surfaces to receive carpet shall be in conditions satisfactory to carpet installer. Moisture conditions of surfaces should be considered in selecting adhesive to provide proper bond between the substrate and carpet backing.

E. Perform calcium hydration tests at existing slab in accordance with the recommendations of the Carpet Manufacturer. Advise Architect and Owner of results prior to installation of and flooring materials.

3.02 PREPARATION

A. Vacuum substrate immediately prior to carpet installation and remove all deleterious substances which could interfere with the installation or be harmful to the work. Repair minor irregularities in floor slabs.

B. Installer shall notify Contractor in writing of any condition deemed adverse to satisfactory carpet installation. Starting of installation shall constitute acceptance of substrate surface conditions, and Installer shall be held responsible to furnish satisfactory carpet installation. Any carpet work not acceptable shall be replaced at no cost to Owner.

C. Place underlayment where required to provide a level and suitable surface to receive flooring materials.

3.03 INSTALLATION

A. Installation of carpet shall be coordinated with respective contractors, and the schedule reviewed for approval by Architect.

B. Direct-Glue Method: Install in accordance with approved carpet manufacturer's recommended procedures.

C. Match colors of edge seams. Do not place seams in areas of change of direction or foot traffic. True all cut edges and make seams non-raveling and inconspicuous. Make all seams inconspicuous as possible, flat unpuckered and free from glue.

D. Install carpet with pile inclination in one direction. Imperfections will not be accepted and shall be removed and replace with acceptable material at not additional cost to the owner.

E. Fit carpet neatly into breaks and recesses, against walls, around pipes and penetrations, under saddles and thresholds and around permanent cabinets and equipment.

F. Carpet Edge Strips or Edgings: Provide wherever carpeting abuts other types of floors or floor covering. Install straight and true. Fasten to floors using adhesive in accordance with manufacturer's directions. Where carpet terminates at door openings, center strips under doors.

G. Seaming Methods: Installation shall be according to manufacturer's recommended standards and procedures for quality and type of carpets selected. All seaming unless specifically noted otherwise shall be compression type.

H. Seam Buttering: All seams shall have seam beading (buttering) with an approved seam adhesive. All buttering must be dry prior to closing seam. Force buttering adhesive into carpet backing by thumb pressure or other approved method.

I. Cut face with face cutter, following tufts. Sandbag completed seam, leaving bags minimum of 4 hours. Cut larger widths 3/8" oversize. Cut lesser widths 1/8" oversize.

3.04 CLEANING

After installation is complete, clean adhesive, dirt, and debris from carpet surfaces. Clean spots with approved spot remover. Remove loose threads with sharp scissors, and vacuum clean. Leave surfaces clean and free from ripples, scallops, puckers. Leave entire installation in an approved condition. Cleaning techniques and care of carpet shall be defined in writing and submitted per provisions of Section 01 78 00.

3.05 PROTECTION

A. Protect work and materials of this Section prior to and during installation and protect the installed work and materials of other trades.

B. In the event of damage, make all repairs and replacements necessary to the approval of the Architect at no additional cost to the Owner.

C. Provide a temporary non-staining paper pathway in all traffic areas.

3.06 EXTRA STOCK

A. Upon completion, and as a condition of installation acceptance, deliver to the Owner six swatches of each color and pattern of carpeting installed, for Owner's use in future patching. Make all swatches at least 12 inches square; securely wrap and label each package for proper identification.

B. All salvageable carpet material remnants shall also be packaged and given to the Owner.

END OF SECTION 09 68 00

SECTION 09 90 00 - PAINTING

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

A. Extent of painting work is shown on Drawings and Schedules, and as herein specified.

B. Paint all new surfaces, except as otherwise specified. Number of coats specified are minimum; uniform coverage is required, free from defects or blemishes.

C. Perform all painting work in any room in which finishing work is performed, including painting new surfaces as specified.

D. Surface preparation, priming, texture where specified and coats of paint specified are in addition to shop priming and surface treatment specified under other Sections of Work.

E. Work includes field painting of all bare and covered pipes (where required by Mechanical Drawings), and of hangers, exposed steel and iron work, and primed metal surfaces of equipment installed under mechanical and electrical work, except as otherwise indicated. All roof top mechanical units shall be painted. Exposed fireproofing shall not be painted.

F. "Paint" as used herein means all coating systems materials, which includes primers, emulsions, enamels, stain, sealers and fillers, and other applied materials whether used as prime, intermediate or finish coats.

G. Paint all exposed surfaces whether or not colors are designated in any "schedule", except where natural finish of material is specifically noted as surface not to be painted. Where items or surfaces are not specifically mentioned, paint these same as adjacent similar materials or areas. If color or finish is not designated, Architect will select these from standard colors available for materials systems specified.

H. Paint Existing surfaces at locations as noted on the Drawings and as required at existing areas adjacent to areas where new work is to be performed but not scheduled on the Drawings. Take new paint back to a point where the transition between new paint and existing paint will be the least noticeable.

1.02 RELATED WORK

A. Division 5: Priming of miscellaneous metals.

B. Section 07 60 00: Priming of unexposed portions of sheet metal.

C. Section 09 25 00: Taping and preparation of gypsum wallboard.

D. Section 09 25 00: Spray texturing of Walls and Ceilings to match existing.

1.03 PAINTING NOT INCLUDED

Following categories of work are not included as part of field-applied finish work, or are included in other Sections of these Specifications:

A. Shop priming: Unless otherwise specified, shop priming of ferrous metal items is included under various Sections for structural steel, miscellaneous metal items, hollow metal work, and similar items, and for such fabricated components as architectural woodwork, wood casework, and shop-fabricated or factory-built mechanical and electrical equipment or accessories.

B. Pre-finished items: Unless otherwise indicated, do not include painting when factory-finishing or installer- finishing is specified for such items as (but not limited to) toilet enclosures, finish hardware, plastic covering, ceramic tile, drapery and track, finished mechanical and electrical equipment including light fixtures and distribution cabinets, and equipment.

C. Concealed surfaces: Unless otherwise indicated, painting is not required on wall or ceiling surfaces in concealed areas and generally inaccessible areas, such as foundation spaces, furred areas, pipe spaces and duct shafts.

D. Finished metal surfaces: Metal surfaces of anodized aluminum, stainless steel, chromium plate, copper, bronze, and similar finished materials will not require finish painting, unless otherwise indicated.

E. Operating parts and labels: Moving parts of operating units, mechanical and electrical parts, such as valve and damper operators, linkages, sinkages, sensing devices, motor and fan shafts will not require finish painting unless otherwise indicated.

F. Do not paint over any code-required labels, such as Underwriter's Laboratories and Factory Mutual, or any equipment identification, performance rating, name, or nomenclature plates.

1.04 QUALITY ASSURANCE

Paint coordination: Provide finish coats which are compatible with prime paints used. Review other Sections of these Specifications in which prime paints are to be provided to ensure compatibility of total coatings system for various substrates. Upon request from other subcontractors, furnish information on characteristics of finish materials proposed for use, to

ensure that compatible prime coats are used. Provide barrier coats over incompatible primers or remove and reprime as required. Notify Architect in writing of any anticipated problems using coating systems as specified with substrates primed by others.

1.05 SUBMITTALS

A. Refer to Section 01 30 00 - SUBMITTALS.

B. Manufacturer's data: Submit manufacturer's technical information, including paint label analysis and application instructions for each material proposed for use.

1. List each material and cross-reference to specific paint and finish system and application. Identify by manufacturer's catalog number and general classification.

C. Samples: Submit samples for Architect's review and selection of color and texture only. Compliance with all other requirements is exclusive responsibility of Contractor. Provide listing of material and application for each coat of each finish sample.

1. On 8 x 12-inch cardboard, provide two samples of each color and material, with texture to simulate actual conditions. Resubmit each sample as requested until acceptable sheen, color, and texture is achieved.

1.06 DELIVERY AND STORAGE

A. Deliver all materials to job site in original, new and unopened packages and containers bearing manufacturer's name and label, and the following information.

1. Name or title of material.

2. Manufacturer's stock number and date of manufacture.

3. Manufacturer's name.

4. Contents by volume, for major pigment and vehicle constituents.

5. Thinning instructions.

6. Application instructions.

7. Color name and number.

1.07 JOB CONDITIONS

A. Apply water-base paints only when temperature of surfaces to be painted and surrounding air temperatures are between 50 degrees F and 90 degrees F unless otherwise permitted by paint manufacturer's printed instructions.

B. Apply solvent-thinned paints only when temperature of surfaces to be painted and surrounding air temperatures are between 45 degrees F and 95 degrees F, unless otherwise permitted by paint manufacturer's printed instructions.

C. Do not apply paint in rain, fog, or mist; or when relative humidity exceeds 85%; or to damp or wet surfaces, unless otherwise permitted by paint manufacturer's printed instructions.

D. Painting may be continued during inclement weather only if areas and surfaces to be painted are enclosed and heated within temperature limits specified by paint manufacturer during application and drying periods.

PART 2 - PRODUCTS

2.01 MATERIAL QUALITY

A. Provide best quality grade of various types of coatings as regularly manufactured by acceptable paint materials manufacturers. Materials not displaying manufacturer's identification as standard, best-grade product will not be acceptable. As a standard of quality and performance, conform to existing building standard

B. Manufacturers offering products to comply with requirements include following:

1. Sherwin Williams

2. Dunn-Edwards

3. Kelly Moore

C. Provide undercoat paint produced by same manufacturer as finish coats. Use only thinners approved by paint manufacturer and use only to recommended limits. Undercoat, topping coats and/or sealer shall be of type required and recommended by paint manufacturer to ensure that gypsum board taping and paper surfaces will not telegraph varying textures, sheens, or irregular appearances.

D. Provide paints of durable and washable quality. Use paint materials which will withstand normal washing as required to remove pencil marks, ink, ordinary soil, etc., without showing discoloration, loss of gloss, staining, or other damage.

2.02 COLORS AND FINISHES

A. Use representative colors when preparing samples for Architect's review.

B. Proprietary names used to designate colors or materials are not intended to imply that products of named manufacturers are required to exclusion of equivalent products of other manufacturers.

C. Color pigments: Pure, non-fading, applicable types to suit substrates and service indicated.

D. Exterior painting, none anticipated.

E. Interior painting, except as indicated, will be limited to 5 colors, combined in one area.

2.03 EXTERIOR PAINT SYSTEMS SCHEDULE

A. Metal doors and frames and mechanical units:

1st Coat:	Preventative Acrylic Primer
2nd Coat:	Acrylic Semi-Gloss Paint
3rd Coat:	Acrylic Semi-Gloss Paint

B. Galvanized metal:

1st Coat:	Rust-Preventative Acrylic Primer
2nd Coat:	Acrylic Semi-Gloss Paint
3rd Coat:	Rust-Preventative Acrylic Semi-Gloss Paint

C. Steel fabrications:

1st Coat:	Rust-Preventative Acrylic Primer
2nd Coat:	Acrylic Semi-Gloss Paint
3rd Coat:	Acrylic Semi-Gloss Paint

D. Aluminum:

1st Coat:	Rust-Preventative Acrylic Primer
2nd Coat:	Acrylic Semi-Gloss Paint
3rd Coat:	Acrylic Semi-Gloss Paint

E. Cement Plaster:

1st Coat:	Acrylic Primer/Sealer

2nd Coat: Exterior Acrylic Flat Paint
3rd Coat: Exterior Acrylic Flat Paint

2.04 INTERIOR PAINT SYSTEMS SCHEDULE

A. Metal electric panels, etc.:

1st Coat: Primer to suit
2nd Coat: Semi-gloss acrylic latex enamel
3rd Coat: Semi-gloss acrylic latex enamel, additional coats as required to cover

B. Wood trims and doors (paint finish):

1st Coat: Wood primer
2nd Coat: Semi-gloss acrylic latex enamel
3rd Coat: Semi-gloss acrylic latex enamel, additional coats as required to cover

D. Gypsum Board (Typical):

Topcoat: As required/recommended to taped and topped gypsum board surfaces.

Spray texture as Schedule. Furnish under section 09250.

1st Coat: Synthetic resin emulsion primer sealer
2nd Coat: Semi-gloss acrylic latex enamel
3rd Coat: Semi-gloss acrylic latex enamel, additional coats as required to cover.

D. Gypsum Board (Service spaces, electrical rooms: walls/ceilings):

Topcoat: As required/recommended to taped and topped gypsum board surfaces.

1st Coat: Primer
2nd Coat: Flat acrylic latex
3rd Coat: Flat acrylic latex as required to cover

E. Gypsum/Smooth Surfaces not referenced elsewhere:

Topcoat: As required/recommended to taped and topped smooth

gypsum wallboard surfaces

1st Coat:	Primer (per manufacturer's recommendation)
2nd Coat:	(Smooth Finish) Semi-gloss acrylic latex enamel
3rd Coat:	(Smooth Finish) Semi-gloss acrylic latex enamel, additional coats as required to cover

PART 3 - EXECUTION

3.01 INSPECTION

A. Applicator must examine areas and conditions under which painting work is to be performed and notify Contractor in writing of conditions detrimental to proper and timely completion of work. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to applicator.

B. Starting of painting work will be construed as applicator's acceptance of surfaces within any particular area.

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

3.02 SURFACE PREPARATION

A. General:

1. Perform all preparation and cleaning procedures in strict accordance with paint manufacturer's instructions and as herein specified, for each particular substrate condition.

2. Remove all hardware, hardware accessories, machined surfaces, plates, lighting fixtures, and similar items in place and not to be finish painted or provide surface-applied protection prior to surface preparation and painting operations. Remove, is necessary, for complete painting of items and adjacent surfaces. Following completion of painting of each space or area, reinstall removed items by workmen skilled in trades involved.

3. Clean surfaces to be painted before applying paint or surface treatments. Remove oil and grease with clean cloths and cleaning solvents prior to mechanical cleaning. Program cleaning and painting so that dust and other contaminants from cleaning process will not fall in wet, newly painted surfaces.

4. Provide sealers, topcoats, or other surface preparation to taped and topped

gypsum board surfaces as required and as recommended by paint and gypsum wall board manufactures to eliminate all telegraphing of paper surface textures through the painted finishes.

B. Cementitious materials:

1. Prepare cementitious surfaces of concrete and cement plaster to be painted by removing all efflorescence, chalk, dust, dirt, grease, oils, and by roughening as required to remove glaze.

2. Determine alkalinity and moisture content of surfaces to be painted by performing appropriate tests. If surfaces are found to be sufficiently alkaline to cause blistering and burning of finish paint, correct this condition before application of paint.

3. Do not paint over surfaces where moisture content exceeds 8%, unless otherwise permitted in manufacturer's printed directions.

C. Ferrous metals: Clean non-galvanized, ferrous surfaces that have not been shop-coated of all oil, grease, dirt, loose mill scale and other foreign substances by solvent or mechanical cleaning, complying with Steel Structures Painting Council (SSPC)-SP3.

D. Galvanized surfaces: Clean free of oil and surface contaminates with acceptable non-petroleum-based solvent. Etch with a zinc-acid phosphate solution.

3.03 MATERIALS PREPARATION

A. Mix and prepare painting materials in strict accordance with manufacturer's directions.

B. Store materials not in actual use in tightly covered containers. Maintain containers used in storage, mixing, and application of paint in clean condition, free of foreign materials and residue.

C. Stir all materials before application to produce mixture of uniform density, and as required during application of materials. Do not stir any film which may form on surface into material. Remove film and, if necessary, strain material before using.

3.04 APPLICATION

A. General:

1. Apply paint by brush, roller, spray, or other acceptable practice in accordance with manufacturer's directions. Use brushes best suited for type of material

being applied. Use rollers of carpet, velvet back, or high pile sheep's wool as recommended by paint manufacturer for material and texture required.

2. Number of coats and paint film thickness required is same regardless of application method. Do not apply succeeding coats until previous coat has completely dried. Sand between each enamel or varnish coat application with fine sandpaper or rub surfaces with pumice stone where required to produce even, smooth surface in accordance with manufacturer's directions.

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

4. Finish exterior doors on tops, bottoms, and side edges same as exterior faces, unless otherwise indicated.

5. Omit first coat (primer) on metal surfaces which have been shop primed and touch-up painted, unless otherwise indicated.

B. Minimum coating thickness: Apply each material at not less than manufacturer's recommended spreading rate, to provide total dry film thickness as indicated. Dry film thickness of vinyl wash pretreatment shall be 0.3 to 0.5 mils maximum.

C. Scheduling painting: Apply first-coat material to surfaces that have been cleaned, pre-treated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration. Surfaces shall be prime coated within 12 hours of application of vinyl wash pretreatment.

Allow sufficient time between successive coatings to permit proper drying. Do not recoat until paint has dried to where it feels firm, does not deform, or feel sticky under moderate thumb pressure, and application of another coat of paint does not cause lifting or loss of adhesion of undercoat.

D. Prime coats: Recoat primed and sealed walls and ceilings where there is evidence of suction spots or unsealed areas in first coat, to assure finish coat with no burn-through or other defects due to insufficient sealing.

E. Brush application: Brush-out and work all brush coats onto surfaces in even film. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections will not be acceptable. Neatly draw all glass and color break lines. Brush apply all primer or first coats, unless otherwise permitted to use mechanical applicators.

F. Mechanical applicators: Use mechanical methods for paint application when permitted by governing ordinances and trade union regulations. If permitted, limit to only those surfaces impracticable for brush applications.

G. Complete Work: Match approved samples for color, texture and coverage. Remove, refinish, or repaint Work not in compliance with specified requirements.

3.05 PROTECTION

A. Protect work of other trades, whether to be painted or not, against damage by painting and finishing work. Leave all such work undamaged. Correct any damages by cleaning, repairing, or replacing, and repainting, as acceptable to Architect.

B. Provide "Wet Paint" signs as required to protect newly painted finishes. Remove temporary protective wrappings provided by others for protection of their work after completion of painting operations.

3.06 CLEAN-UP

A. During progress of work, remove from site all discarded paint materials, rubbish, cans and rags at end of each workday.

B. Upon completion of painting work, clean window glass and other paint-spattered surfaces. Remove spattered paint by proper methods of washing and scraping, using care not to scratch or otherwise damage finished surfaces.

C. At completion of work of other trades, touch-up and restore all damaged or defaced painted surfaces.

END OF SECTION

SECTION 10 40 00 - IDENTIFING DEVICES

1 - GENERAL

1.01 SCOPE

A. Furnish and install toilet room signs, directional handicap and informational signs, site signage and special signage as shown on the Drawings and specified here.

1.02 RELATED WORK

A. Pavement Stripping: Section 02 58 00.

B. Finish Hardware: Section 08 70 00.

C. Flush Wood Doors: Section 08 20 00.

D. Gypsum Wallboard: Section 09 25 00.

1.03 QUALITY ASSURANCE

A. Catalog Standards:

1. Manufacturer's catalog numbers may be indicated on Drawings for convenience in identifying specified items. Unless modified by notation on Drawings or specified, catalog description for indicated number constitutes requirements for the item specified.

2. The use of catalog numbers and specific requirements set forth in Drawings and Specifications does not preclude use of any other manufacturer's products or procedures which may be equivalent. Such numbers and requirements establish standards of design and quality for materials, construction and workmanship.

B. CBC, California Building Code 2019 Edition

C. Signage shall be in conformance with the Americans with Disabilities Act (ADA).

1.04 SUBMITTALS

A. Refer to Section 01 33 00 for submitting the following items:

1. Product Data. Submittal required.

2. Installation Instructions and Drawings. Submittal required.

3. Shop Drawings. Submittal required.

4. Samples for color review. 2 Frame Samples. 2 Plaque Samples.

1.05 DELIVERY, STORAGE AND HANDLING

A. Deliver undamaged products to site in manufacturer's sealed containers or wrappings with legends intact. Store on site secure from weather, soil and physical damage.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Provide signage and graphics of a style and quality provided by ASI Sign Systems, Inc., SP Series, Style SPE Andco Industries Corp., PME 1000 Series or approved equal plaque sign system.

B Exterior metal site signage shall be as manufactured by Emed Company, Inc., National Marker Co., or approved equal

2.02 INTERIOR SIGNAGE

A. Sign Type 1:

1. Transparent .080-inch thick, semi-matte acrylic plastic plaque.
2. Sign Size: 8" (20cm) high x 6" (15cm) wide (unless otherwise noted 1/8" (3.2mm) thick.
3. Letter shall be reverse side screen printed. Color: White. Style: Helvetica Medium, Upper and Lower Case.
4. Colored subsurface background. Color as selected by the Architect. Thickness: .080 inches.
5. Universal Symbols figures and letter text and locations shall be as scheduled and indicated on the Drawings. Letter size: ¾” high (1.9cm).
6. Mounting heights shall be as indicated on the Drawings.
7. Braille text strip.
8. Furnish for: Unisex

B. Sign Type 2:

1. Transparent .080-inch thick, semi-matte acrylic plastic plaque.
2. Sign Size: 8" (20cm) high x 6" (15cm) wide (unless otherwise noted 1/8" (3.2mm) thick.
3. Letter shall be reverse side screen printed. Color: White. Style: Helvetica Medium, Upper and Lower Case.

4. Colored subsurface background. Color as selected by the Architect. Thickness: .080 inches.
5. Graphics and text at locations shall be indicated on the Drawings. Letter size: ¾" high (1.9cm).
6. Mounting heights shall be a scheduled and indicated on the Drawings.
7. Braille text strip.
8. Furnish as indicated on the Drawings

C. Sign Type 3:

1. Provide unisex restroom handicapped signs of transparent 1/4" (6.2mm) thick semi-matte acrylic plastic plate with raised Universal Handicapped Symbol, 2-1/2" (6.4cm) high, in center of 12" or to suit (30cm) diameter circle for women and superimposed 12" (30cm) equilateral triangle for men.

    a. Signs shall be in accordance with CBC, Section 11B-216 & 11B-703 and ADA.

2. Base plate subsurface background color to be as selected by the Architect with Universal Symbol subsurface background color to be as selected by the Architect.
3. Locations and mounting shall be as indicated on the Drawings.
4. Braille text strip stating, "UNISEX"

PART 3 - EXECUTION

3.01 INSPECTION

A. Prior to installation, carefully inspect and verify that the installed work of other trades is complete to the point where this installation may properly commence.

B. Verify that specified items may be installed in accordance with the approved design.

C. In the event of discrepancy, immediately notify Contractor. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.02 INSTALLATION OF IDENTIFYING DEVICES

A. Install identifying devices in accordance with accepted Shop Drawings.

B. Attach signs with appropriate adhesive as recommended by manufacturer, to be compatible and appropriate for the wall surfaces. Place as indicated and in accordance with accepted shop drawings.

1. Use extreme caution in placing adhesive on backs of signs so that adhesive will not be visible at edges of signs.

C. Signage Mounting:

1. Refer to Article 2.02 for the appropriate signage type.

2. Locations of all signs must be approved by the Architect prior to installation.

3. Confirm to CBC, Section 11B-216 & 11B-703

3.03 ADJUSTING AND CLEANING

A. Remove all dust, dirt, finger marks, etc. from signs and letters, as recommended by manufacturer.

B. Keep building and premises free from accumulated waste materials, rubbish and debris resulting from work herein. Upon completion, remove tools, appliances, surplus materials, waste materials, rubbish, debris, and accessory items used in or resulting from said work, and legally dispose of offsite.

3.04 PROTECTION

A. Protect work and materials of this Section prior to and during installation and protect the installed work and materials of all other trades.

B. In the event of damage, immediately make all repairs and replacements necessary to the approval of the Architect and at no cost to the Owner.

-END OF SECTION-

TOILET ACCESSORIES – SECTION 10 80 00

PART 1 - GENERAL

1.01 RELATED WORK

A. Section 06100: Wood backing and blocking.

B. Section 09 10 00: Metal backing plates

C. Section 09300: Tile.

1.02 SUBMITTALS

A. Refer to Section 01 30 00.

B. Manufacturer's data: Submit manufacturer's data on each item furnished including complete instructions for installation. Adhesive installation not permitted.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Mirrors w/shelves: Bobrick B-292 Series, Bradley 781, or approved equal, complete with stainless steel or satin chrome, angle framed with edge trim, shelf, and with galvanized steel hanger assemblies. All corners shall be square. Mirrors shall have zinc-coated steel backing and protective coating. 18”x30” centered over Lavatory sinks as indicated on Drawings at each toilet room.

B. Toilet Tissue Dispenser: Bobrick B-288, Bradley 5402, or approved equal. Surface mounted, multi-roll tissue dispenser. Type 304 stainless steel, satin finish, slope top. Provide at each toilet room at locations as noted.

C. Grab Bars: Bobrick Series B-6206, Bradley 883, or approved equal; 18 gage, 1-1/2 inches O.D. Type 304 stainless steel welded to 13 gage Type 304 solid stainless steel concealed wall mounting plates. Intermediate supports similar. All joints ground and polished. Concealing flange shall be 3 inches od. Type 304 stainless steel, 1/2" deep 11 gauge. Satin finish on all exposed surfaces. Provide as shown.

D. Toilet Seat Cover Dispensers: Bobrick B-221, Bradley 583, or approved equal; heavy gage type 304 stainless steel, satin finish; surface mounted; 250 seat cover capacity. Provide one for each water closet.

E. Sanitary Napkin Disposal Unit: Bobrick B-254, Bradley 4722-15, or approved equal,

surface mount; 22 gage, type 304 stainless steel, satin finish; seamless flanges and self-closing doors. Provide at each Unisex Restroom.

J. Paper Towel Dispenser/Waste Drop: Bobrick B-3900, Bradley 235, or approved equal; recessed, stainless steel satin finish; removable stainless steel waste container; dispenses 600 C-fold or 800 multi-fold or 1100 single fold paper towels. Provide at each toilet room and locations scheduled.

K. Liquid Soap Dispensers: Bobrick B-2111, Bradley 6562, or approved equal, wall mounted, surface 40 fluid ounce stainless steel cover. Provide at locations as indicated on the Drawings.

L. Hat and Coat Hook: Bobrick B682, Bright-polished stainless steel. For robes, shoe-shine cloth, and Flange is 2" x 2". Hook 1" W, 6 ½" H; projects 3 1⁄16" from wall. Concealed wall plate. Provide one at each Unisex Restroom. Locations as directed.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install where shown or as specified.

B. Use concealed vandal-proof fastenings wherever possible. Provide anchors, bolts and other necessary fasteners, and attach accessories securely to walls or toilet partitions as recommended by manufacturer for each item and each type of substrate condition.

-END OF SECTION-

DIVISION 22: PLUMBING

END TABLE OF CONTENTS

COMMON PLUMBING REQUIREMENTS

SECTION 22 05 01

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Furnish labor, materials, and equipment necessary for completion of work as described in Contract Documents.

B. It is the intent of these specifications that the systems specified herein are to be complete and operational before being turned over to the owner. During the bidding process, the contractor is to ask questions or call to the engineer's attention any items that are not shown or may be required to make the system complete and operational. Once the project is bid and the contractor has accepted the contract, it is his responsibility to furnish and install all equipment and parts necessary to provide a complete and operational system without additional cost to the owner.

C. Furnish and install fire stopping materials to seal penetrations through fire rated structures and draft stops.

1.3 SUBMITTALS

A. Substitutions: By specific designation and description, standards are established for specialties and equipment. Other makes of specialties and equipment of equal quality will be considered provided such proposed substitutions are submitted to the Architect for his approval, complete with specification data showing how it meets the specifications, at least 5 working days prior to bid opening. A list of approved substitutions will be published as an addendum, but does not relieve Contractor from meeting all requirements of the specifications.
   1. Submit a single copy of Manufacturer's catalog data including Manufacturer's complete specification for each proposed substitution.
   2. The Architect or Engineer is to be the sole judge as to the quality of any material offered as an equal.

B. Product Data, Shop Drawings: Within 30 days after award of contract, submit 10 sets of Manufacturer's catalog data for each manufactured item.
   1. Literature shall include enough information to show complete compliance with Contract Document requirements.
   2. Mark literature to indicate specific item with applicable data underlined.
   3. Information shall include but not be limited to capacities, ratings, type of material used, guarantee, and such dimensions as are necessary to check space requirements.
   4. When accepted, submittal shall be an addition to Contract Documents and shall bein equal force. No variation shall be permitted.
   5. Even though the submittals have been accepted by the Engineer, it does not relieve the contractor from meeting all of the requirements of the plans and specifications and providing a complete and operational system.

C. Drawings of Record: One complete set of blue line mechanical drawings shall be provided for the purpose of showing a complete picture of the work as actually installed.

1. These drawings shall serve as work progress report sheets. Contractor shall make notations neat and legible therein daily as the work proceeds.
2. The drawings shall be kept at the job at a location designated by the Mechanical Engineer.
3. At completion of the project these "as-built" drawings shall be signed by the Contractor, dated, and returned to the Architect.

D. Operating Instructions and Service Manual: The Mechanical Contractor shall prepare 2 copies of an Operation and Maintenance Manual for all mechanical systems and equipment used in this project. Manuals shall be bound in hard-backed binders and the front cover and spine of each binder shall indicate the name and location of the project. Use plastic tab indexes for all sections. Provide a section for each different type of equipment item. The following items shall be included in the manual, together with any other pertinent data. This list is not complete and is to be used as a guide.
1. Provide a master index at the beginning of the manual showing all items included.
2. The first section of the manual shall contain:
    a. Names, addresses, and telephone numbers of Architect, Mechanical Engineer, Electrical Engineer, General Contractor, Plumbing Contractor, Sheet Metal Contractor, and Temperature Control Contractor.
    b. List of Suppliers which shall include a complete list of each piece of equipment used with the name, address, and telephone number of vendor.
    c. General Description of Systems including –
        1) Location of all major equipment
        2) Description of the various mechanical systems
        3) Description of operation and control of the mechanical systems
        4) Suggested maintenance schedule
    d. Copy of contractor's written warranty
3. Provide a copy of approved submittal literature for each piece of equipment.
4. Provide maintenance and operation literature published by the manufacturer for each piece of equipment which includes: oiling, lubrication and greasing data; belt sizes, types and lengths; wiring diagrams; step-by-step procedure to follow in putting each piece of mechanical equipment in operation.
5. Include parts numbers of all replaceable items.
6. Provide control diagram and operation sequence, along with labeling of control piping and instruments to match diagram.
7. Include a valve chart indicating valve locations.
8. Include air balance and/or water balance reports.

1.4 QUALITY ASSURANCE

A. Requirements of Regulatory Agencies:
1. Perform work in accordance with applicable provisions of local and state Plumbing Code, Gas Ordinances, and adoptions thereof. Provide materials and labor necessary to comply with rules, regulations, and ordinances.
2. In case of differences between building codes, state laws, local ordinances, utility company regulations, and Contract Documents, the most stringent shall govern. Promptly notify Architect in writing of such differences.

B. Applicable Specifications: Referenced specifications, standards, and publications shall be of the issues in effect on date of Advertisement for Bid.
1. "Heating, Ventilating and Air Conditioning Guide" published by the American Society of Heating and Air Conditioning Engineers.
2. "Engineering Standards" published by the Heating, Piping, and Air Conditioning Contractors National Association.

3. "2015 International Building Code", "2015 International Mechanical Code", and "2015 International Fire Code" as published by the International Conference of Building Officials.
4. “2017 Idaho Plumbing Code” as published by the International Association of Plumbing and Mechanical Officials.
5. "National Electrical Code" as published by the National Fire Protection Association.
6. "2015 International Energy Conservation Code ".

1.5 INSPECTIONS AND PERMITS

A. Pay for permits, fees, or charges for inspection or other services. Local and state codes and ordinances must be properly executed without expense to Owner and are considered as minimum requirements. Local and state codes and ordinances do not relieve the Contractor from work shown that exceeds minimum requirements.

1.6 ADDITIONAL WORK:

A. Design is based on equipment as described in the drawing equipment schedule. Any change in foundation bases, electrical wiring, conduit connections, piping, controls and openings required by alternate equipment submitted and approved shall be paid for by this division. All work shall be in accordance with the requirements of the applicable sections.

PART 2 - NOT USED

PART 3 - EXECUTION

3.1 EXAMINATION

A. Site Inspection:
   1. Examine premises and understand the conditions which may affect performance ofwork of this Division before submitting proposals for this work.
   2. No subsequent allowance for time or money will be considered for any consequence related to failure to examine site conditions.

B. Drawings:
   1. Plumbing drawings show general arrangement of piping, equipment, etc, and do not attempt to show complete details of building construction which affect installation. This Contractor shall refer to architectural, structural, mechanical, and electrical drawings for additional building detail which affect installation of his work.
      a. Follow plumbing drawings as closely as actual building construction and workof other trades will permit.
      b. No extra payments will be allowed where piping and/or ductwork must be offset to avoid other work or where minor changes are necessary to facilitateinstallation.
      c. Everything shown on the plumbing drawings shall be the responsibility ofPlumbing Contractor unless specifically noted otherwise.
   2. Consider architectural and structural drawings part of this work insofar as these drawings furnish information relating to design and construction of building. These drawings take precedence over mechanical drawings.
   3. Because of small scale plumbing drawings, it is not possible to indicate all offsets, fittings, and accessories which may be required. Investigate structural and finish conditions affecting this work and arrange work accordingly, providing such fittings, valves, and accessories required to meet conditions. Do not scale drawings for locations of equipment or piping. Refer to large scale dimensioned drawings for exact locations.

C. Insure that items to be furnished fit space available. Make necessary field measurements to ascertain space requirements including those for connections and furnish and install equipment of size and shape so final installation shall suit true intent and meaning of Contract Documents.
   1. If approval is received to use other than specified items, responsibility for specified capacities and insuring that items to be furnished will fit space available lies withthis Division.
   2. If non-specified equipment is used and it will not fit job site conditions, this Contractor assumes responsibility for replacement with items named in Contract Documents.

3.2 PREPARATION

A. Cut carefully to minimize necessity for repairs to existing work. Do not cut beams, columns, or trusses.
   1. Patch and repair walls, floors, ceilings, and roofs with materials of same quality and appearance as adjacent surfaces unless otherwise shown. Surface finishes shall exactly match existing finishes of same materials.
   2. Each Section of this Division shall bear expense of cutting, patching, repairing, and replacing of work of other Sections required because of its fault, error, tardiness, or because of damage done by it.
   3. Cutting, patching, repairing, and replacing pavements, sidewalks, roads, and curbs to permit installation of work of this Division is responsibility of Section installingwork.

3.3 INSTALLATION

A. Arrange pipes, ducts, and equipment to permit ready access to valves, unions, traps, starters, motors, control components, and to clear openings of doors and access panels.

3.4 STORAGE AND PROTECTION OF MATERIALS:

A. Provide storage space for storage of materials and assume complete responsibility for losses due to any cause whatsoever. Storage shall not interfere with traffic conditions in any public thoroughfare.

B. Protect completed work, work underway, and materials against loss or damage.

C. Close pipe openings with caps or plugs during installation. Cover fixtures and equipment and protect against dirt, or injury caused by water, chemical, or mechanical accident.

3.5 EXCAVATION AND BACKFILL

A. Perform necessary excavation of whatever substance encountered for proper laying ofall pipes and underground ducts.
   1. Excavated materials not required for fill shall be removed from site as directed by Engineer.
   2. Excavation shall be carried low enough to allow a minimum coverage over underground piping of 5'-0" or to be below local frost level.
   3. Excess excavation below required level shall be backfilled at Contractor's expense with earth, sand, or gravel as directed by Engineer. Tamp ground thoroughly.
   4. Ground adjacent to all excavations shall be graded to prevent water running into excavated areas.

B. Backfill pipe trenches and allow for settlement.
   1. Backfill shall be mechanically compacted to same density as surrounding undisturbed earth.
   2. Cinders shall not be used in backfilling where steel or iron pipe is used.

3. No backfilling shall be done until installation has been approved by the Engineer.

3.6 COOPERATION

A. Cooperate with other crafts in coordination of work. Promptly respond when notified that construction is ready for installation of work under Division 22. Contractor will be held responsible for any delays which might be caused by his negligence or failure to cooperate with the other Contractors or crafts.

3.7 SUPERVISION

A. Provide a competent superintendent in charge of the work at all times. Anyone found incompetent shall be removed at once and replaced by someone satisfactory, when requested by the Architect.

3.8 INSTALLATION CHECK:

A. An experienced, competent, and authorized representative of themanufacturer or supplier of each item of equipment indicated in the equipment schedule shall visit the project to inspect, check, adjust if necessary, and approve the equipment installation. In each case, the equipment supplier's representative shall be present when the equipment is placed in operation. The equipment supplier's representative shall revisit the project as often as necessary until all trouble is corrected and the equipment installation and operation is satisfactory to the Engineer.

B. Each equipment supplier's representative shall furnish to the Owner, through the Engineer, a written report certifying the following:
   1. Equipment has been properly installed and lubricated.
   2. Equipment is in accurate alignment.
   3. Equipment is free from any undue stress imposed by connecting piping or anchor bolts.
   4. Equipment has been operated under full load conditions.
   5. Equipment operated satisfactorily.

C. All costs for this installation check shall be included in the prices quoted by equipment suppliers.

3.9 CLEANING EQUIPMENT AND PREMISES

A. Properly lubricate equipment before Owner's acceptance.

B. Clean exposed piping, equipment, and fixtures. Repair damaged finishes and leave everything in working order.

C. Remove stickers from fixtures and adjust flush valves.

D. Trap elements shall be removed during cleaning and flushing period. Replace trap elements and adjust after cleaning and flushing period.

3.10 TESTS

A. No piping work, fixtures, or equipment shall be concealed or covered until they have been inspected and approved by the inspector. Notify inspector when the work is ready for inspection.

B. All work shall be completely installed, tested as required by Contract Documents and the County ordinances and shall be leak-tight before the inspection is requested.

C. Tests shall be repeated to the satisfaction of those making the inspections.

D. Water piping shall be flushed out, tested at 100 psi and left under pressure of supply main or a minimum of 40 psi for the balance of the construction period.

3.11 WARRANTEE

A. Contractor shall guarantee work under Division 22 to be free from inherent defects for a period of one year from acceptance.
   1. Contractor shall repair, revise or replace any and all such leaks, failure or inoperativeness due to defective work, materials, or parts free of charge for a period of one year from final acceptance, provided such defect is not due to carelessness in operation or maintenance.

B. In addition to warrantee specified in General Conditions and plumbing systems are to be free from noise in operation that may develop from failure to construct system in accordance with Contract Documents.

3.12 SYSTEM START-UP, OWNER'S INSTRUCTIONS

A. Owner's Instructions
   1. Instruct building maintenance personnel and Owner Representative in operation and maintenance of mechanical systems utilizing Operation & Maintenance Manual whenso doing.
   2. Minimum instruction periods shall be as follows –
      a. Plumbing - Four hours.
   3. Instruction periods shall occur after Substantial Completion inspection when systems are properly working and before final payment is made.
   4. None of these instructional periods shall overlap another.

END OF SECTION

PIPE, PIPE FITTINGS, PIPE HANGERS & VALVES

SECTION 22 05 03

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings, General Provisions of Contract, including General and Supplementary Conditions and Section 22 05 01 apply to this Section.

1.2 SUMMARY

A. General piping and valve materials and installation procedures for all piping systems.

1.3 QUALITY ASSURANCE

A. Manufacture:
   1. Use domestic made valves, pipe and pipe fittings.

B. General: Support components shall conform to Manufacturer's Standardization Society Specification SP-58.

PART 2 - PRODUCTS

2.1 VALVES

A. Ball Valves:
   1. 2" and smaller for domestic water service:
      a. Milwaukee BA-100, bronze, screwed, 600# WOG ball valve with Teflon seats
      b. Victaulic S/722.

B. Use ball valves or butterfly valves everywhere unless noted otherwise.

C. Approved Manufacturers:
   1. Crane
   2. Nibco
   3. Hammond
   4. Stockham
   5. Milwaukee
   6. Victaulic

2.2 PIPE

A. Exposed waste, vent and water piping connections to fixtures shall be chrome plated.

B. Compressed Air Piping: 40-A-120 black steel pipe with black banded 300 lb. malleable iron fittings and coupling or Victaulic press-fit system.

2.3 PIPE HANGERS

A. Adjustable, malleable iron clevis type of a diameter adequate to support pipe size.

B. Approved Manufacturers:
   1. B-Line Systems Fig. B3100
   2. Grinnell No. 260

3. Kin-Line 455
4. Superstrut CL-710

2.4 INSULATING COUPLINGS

A. Suitable for at least 175 PSIG WP at 250 deg F.

B. Approved Manufacturers:
1. Central Plastics Co
2. Victaulic Co
3. Watts Regulator Co

2.5 EXPANSION JOINTS

A. Install at all building expansion joints and as shown on the drawings, flexible, or nipple/flexible coupling combinations for added expansion/deflection. Submit Manufacturer's data.

B. Approved Manufacturers
1. Victaulic Style 155, 150
2. Grinnell - Gruv-Lok
3. Garlock Garlflex 8100
4. Vibration Mountings & Controls, Inc.

2.6 SLEEVES

A. Sleeves shall be standard weight galvanized iron pipe, Schedule 40 PVC, or 14 gauge galvanized sheet metal two sizes larger than pipe or insulation.

B. Steel or heavy steel metal of the telescoping type of a size to accommodate pipe and covering wherever it passes through floors, walls, or ceilings.

2.7 INTERMEDIATE ATTACHMENTS

A. Continuous threaded rod may be used wherever possible.

B. No chain, wire, or perforated strap shall be used.

2.8 FLOOR AND CEILING PLATES

A. Brass chrome plated

2.9 APPROVED MANUFACTURERS - Grinnell and Fee/Mason

A. Concrete Inserts: Grinnell Fig. 282

B. Pipe Hanger Flange: Grinnell Fig. 163

C. Vertical Pipe: Grinnell Fig. 261 or equal.

D. Cast Iron Pipe: Grinnell Fig. 260 clevis hanger or equal

E. Pipe Attachments for steel pipe with 1" or less of insulation:
1. Grinnell Fig. 108 ring
2. Grinnell Fig. 114 turnbuckle adjuster
3. Or equal

PART 3 - EXECUTION

3.1 INSTALLATION

A. Furnish and install complete system of piping, valved as indicated or as necessary to completely control entire apparatus. Pipe drawings are diagrammatic and indicate general location and connections. Piping may have to be offset, lowered, or raised as required or directed at site. This does not relieve this Contractor from responsibility for proper erection of systems of piping in every respect.

B. Properly support piping and make adequate provisions for expansion, contraction, slope, and anchorage.
   1. Cut piping accurately for fabrication to measurements established at site and work into place without springing or forcing.
   2. Do not use pipe hooks, chains, or perforated metal for pipe support.
   3. Remove burr and cutting slag from pipes.
   4. Make changes in direction with proper fittings.
   5. Insulate hangers for copper pipe from piping by means of at least two layers of Scotch 33 plastic tape.
   6. Support piping at 8 feet on center maximum for pipe 1-1/4 inches or larger and 6 feet on center maximum for pipe one inch or less. Provide support at each elbow. Install additional support as required.
   7. Suspend piping from roof trusses or clamp to vertical walls using Unistrut and clamps (except underground pipe). Laying of piping on any building member is notallowed.

C. Arrange piping to not interfere with removal of other equipment, ducts, or devices, or block access to doors, windows, or access openings. Provide accessible, ground joint unions in piping at connections to equipment.

D. Make connections of dissimilar metals with insulating couplings.

E. Provide sleeves around pipes passing through floors, walls, partitions, or structural members.
   1. Seal sleeves with plastic or other acceptable material.
   2. Do not place sleeves around soil, waste, vent, or roof drain lines passingthrough concrete floors on grade.

F. Cap or plug open ends of pipes and equipment to keep dirt and other foreign materials out of system. Do not use plugs of rags, wool, cotton waste, or similar materials.

G. Install piping systems so they may be easily drained.

H. Grade soil and waste lines within building perimeter 1/4 inch fall per ft in direction offlow.

I. Insulate water piping buried within building perimeter.
   1. Do not use reducing bushings, street elbows, or close nipples.
   2. Bury water piping 6 inches minimum below bottom of slab and encase in 2inches minimum of sand.
   3. Do not install piping in shear walls.

J. Valves
   a. Install all isolation shut-off valves in an accusable location.
   b. Install isolation valves at all each branch line serving multiple plumbing fixtures.
   c. Where valves are above hard ceilings, or in walls provide minimum 12 x 12 access door to service valves. Label door “Plumbing Valve Access.”

d. If valves above access doors are not within “arms reach,” install minimum 24 x 24 access door for access.

3.2 HORIZONTAL PIPING INSTALLATION

A. Locate hangers, supports, and anchors near or at changes in piping direction and concentrated loads.

B. Provide for vertical adjustment to maintain pitch required for proper drainage.

C. Allow for expansion and contraction of the piping.

3.3 PIPE SLEEVES AND INSERTS

A. Set sleeves before concrete is poured or floors finished.

B. Inserts for units should be placed in the concrete or masonry during construction to avoid cutting of finished work. When and if cutting becomes necessary, it must be done in accordance with the cutting and patching specifications.

3.4 FLOOR AND CEILING PLATES

A. Install on all pipes passing through floors, partitions, and ceilings.

3.5 UNIONS AND CONNECTIONS

A. Install malleable ground joint unions in hot and cold water piping throughout the system so that any portion can be taken down for repairs or inspections without injury to same or covering.

B. Running threads or long screws will not be permitted in jointing any pipe.

C. Provide dielectric waterways Style #47 between ferrous and non-ferrous metals.

3.6 FIRE STOPPING

A. Fire stop all penetrations of fire walls, fire barriers, fire petitions, and other fire rated walls and ceilings and floors as per IBC Section 711. See Specification 22 0800.

END OF SECTION

IDENTIFICATION FOR PLUMBING PIPES AND EQUIPMENT

SECTION 22 05 53

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Furnish and install identification of plumbing piping and equipment as described in Contract Documents.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Paint:
   1. One Coat Primer:
      a. 6-2 Quick Drying Latex Primer Sealer over fabric covers.
      b. 6-205 Metal Primer under dark color paint.
      c. 6-6 Metal Primer under light color paint.
   2. Finish Coats: Two coats 53 Line Acrylic Enamel.
   3. Performance Standard: Paints specified are from Pittsburgh Paint & Glass (PPG), Pittsburgh, PA www.pittsburghpaints.com or PPG Canada Inc, Mississauga, ON (800) 263-4350 or (905) 238-6441.
   4. Type Two Acceptable Products. See Section 01 6200.
      a. Paint of equal quality from following Manufacturers may be submitted for Architect's approval before use. Maintain specified colors, shades, and contrasts.
         1) Benjamin Moore, Montvale, NJ www.benjaminmoore.com or Toronto, ON (800) 304-0304 or (416) 766-1176.
         2) ICI Dulux, Cleveland, OH or ICI Paints Canada Inc, Concord, ON www.dulux.com.
         3) Sherwin Williams, Cleveland, OH www.sherwin-williams.com.

2.2 VALVE IDENTIFICATION

A. Make a list of and tag all valves installed in this work.
   1. Valve tags shall be of brass, not less than 1"x2" size, hung with brass chains.
   2. Tag shall indicate plumbing or heating service.

PART 3 - EXECUTION

3.1 SCHEDULES

A. Pipe Identification Schedule:
   1. Apply stenciled symbols as follows:

Pipe Use	Abbreviation
Domestic Cold Water	CH
Domestic Hot Water	HW

END OF SECTION

MECHANICAL INSULATION AND FIRE STOPPING

SECTION 22 07 03

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings, General Provisions of Contract, including General and Supplementary Conditions and Section 22 05 01 apply to this Section.

1.2 SUMMARY

A. Furnish and install mechanical insulation and fire stopping as described in Contract Documents including but not limited to the following:
   1. Cold Water Piping Insulation
   2. Hot Water Piping Insulation (Domestic)
   3. Fire Stopping

1.3 QUALITY ASSURANCE

A. Insulation shall have composite (insulation, jacket or facing and adhesive used to adhere facing or jacket to insulation) fire and smoke hazard ratings as tested by Procedure ASTM E-84, NFPA 255 and UL 723 not exceeding: Flame Spread of 25 and Smoke Developed of 50.

B. Insulation Contractor shall certify in writing, prior to installation, that all products to be used will meet the above criteria.

C. Accessories, such as adhesives, mastics, cements, and tapes, for fittings shall have the same component ratings as listed above.

D. Products, or their shipping cartons, shall bear a label indicating that flame and smoke ratings do not exceed above requirements.

E. Any treatment of jacket or facings to impart flame and smoke safety shall be permanent.

F. The use of water-soluble treatments is prohibited.

END OF SECTION

POTABLE WATER PIPE INSULATION

SECTION 22 07 10

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings, General Provisions of Contract, including General and Supplementary Conditions and Section 22 05 01 apply to this Section.

1.2 SUMMARY

A. Furnish and install insulation on above ground hot and cold water lines, fittings, valves, pump bodies, flanges, and accessories as described in Contract Documents.

PART 2 - PRODUCTS

2.1 INSULATION

A. One-inch-thick snap-on glass fiber pipe insulation.

B. Heavy density pipe insulation with factory vapor jacket equal to Fiberglass ASJ may beused.

C. Approved Manufacturers:
   1. CTM
   2. Manville
   3. Owens-Corning
   4. Knauf

2.2 PVC FITTING, VALVE, & ACCESSORY COVERS

A. Approved Manufacturers:
   1. Knauf
   2. Zeston

PART 3 - EXECUTION

3.1 APPLICATION

A. Piping:
   1. Apply insulation to clean, dry piping with joints tightly butted.
   2. Adhere "factory applied vapor barrier jacket lap" smoothly and securely at longitudinal laps with a white vapor barrier adhesive.
   3. Adhere 3-inch-wide self-sealing butt joint strips over end joints.

B. Fittings, Valves, & Accessories:
   1. Insulate with same type and thickness of insulation as pipe, with ends of insulation tucked snugly into throat of fitting and edges adjacent to pipe insulation tufted and tucked in.
   2. Cover insulation with one piece fitting cover secured by stapling or taping ends to adjacent pipe covering.

C. Pipe Hangers:
   1. Do not allow pipes to come in contact with hangers.
   2. Provide 16 ga x 6 inch long galvanized shields at each pipe hanger to protect pipe insulation from crushing by clevis hanger.

END OF SECTION

HANDICAPPED FIXTURES INSULATION

SECTION 22 07 11

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings, General Provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, and Section 22 05 00 apply to this Section.

1.2 SUMMARY

A. Furnish and install handicapped fixtures insulation as described in Contract Documents.

1.3 QUALITY ASSURANCE

A. Insulating device must comply with UBC-85 and federal accessibility standards.

B. Cover must meet federal standards for protection from burns and abrasions.

PART 2 - PRODUCTS

2.1 MANUFACTURED UNITS

A. Insulating device shall be molded fire resistant foam, to encapsulate hot water piping, stop, and P-trap.
   1. Approved Manufacturers:
      a. TCI Products' Skal+Gard SG-100B

B. Safety cover with recloseable sealing strips which allow for removal and replacement for line maintenance may be used on drain and supply lines under lavatories.
   1. Approved Manufacturers:
      a. Handy-Shield
      b. Plumberex

C. Color shall be white.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install tamper-proof locking strap to discourage pilferage.

END OF SECTION

FIRE STOPPING

SECTION 22 08 00

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings, General Provisions of Contract, including General and Supplementary Conditions and Section 22 05 01 apply to this Section.

1.2 SUMMARY

A. Furnish and install fire stopping as described in Contract Documents.

1.3 QUALITY ASSURANCE

A. Fire stopping material shall meet ASTM E814, E84 and be UL listed.

PART 2 - PRODUCTS

2.1 MANUFACTURED UNITS

A. Material shall be flexible, long lasting, intumescent acrylic seal to accommodate vibration and building movement.

B. Caulk simple penetrations with gaps of 1/4" or less with:
   1. Dow Corning Fire Stop Sealant
   2. Pensil 300

C. Caulk multiple penetrations and/or penetrations with gaps in excess of 1/4" with:
   1. Dow Corning Fire Stop Foam
   2. Pensil 200
   3. IPC flame safe FS-1900
   4. Tremco “Tremstop 1A”

PART 3 - EXECUTION

3.1 INSTALLATION

A. Follow manufacturer's installation instructions explicitly.

B. Seal penetrations of ductwork, piping, and other mechanical equipment through one-hour and two-hour rated partitions as shown on Architectural and Mechanical Drawings.

C. Install fire stopping material on clean surfaces to assure adherence.

END OF SECTION

DOMESTIC WATER PIPING SYSTEMS (COPPER)

SECTION 22 11 16

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings, General Provisions of Contract, including General and Supplementary Conditions and Section 22 05 01 apply to this Section.

1.2 SUMMARY

A. Furnish and install potable water piping complete with necessary valves, connections, and accessories inside building and connect with outside utility lines 5 feet from building perimeter.

B. Perform excavating and backfilling required by work of this Section.

1.3 SUBMITTALS

A. Quality Control:
   1. Submit written report of sterilization test to Architect.

PART 2 - PRODUCTS

2.1 PIPE

A. Type K copper for piping underground or beneath concrete slab. 3/4 inch minimum under slabs.

B. Type L hard drawn copper for above ground applications.

2.2 FITTINGS

A. Wrought copper.

2.3 CONNECTIONS:

A. Sweat copper type with 95/5 or 96/4 Tin-Antimony solder. Victaulic copper connection system with “FS” flush-seal gasket and zero-flex couplings.

B. Joints under slabs, if allowed by local codes, shall be brazed.

2.4 BALL VALVES

A. Use ball valves exclusively unless otherwise specified. Ball valves shall be by single manufacturer from approved list below. Valves shall be for 150 PSI SWP.

B. Approved Manufacturers:
   1. Nibco-Scott T595 or S595 or equal by
   2. ConBraCo (Apollo)
   3. Crane
   4. Hammond

5. Jenkins
6. Ohio Brass
7. Stockham
8. Walworth
9. Watts
10. Victaulic

2.5 STOP & WASTE VALVES

A. Approved Manufacturers:
   1. Mark II Oriseal stop & waste valve H15134 by Mueller
   2. Buffalo screw type curb box H-10350 complete with lid and H-10349 enlarged base by Mueller.

2.6 COMBINATION PRESSURE REDUCING VALVE/STRAINER

A. Integral stainless-steel strainer, or separate 'Y' strainer installed upstream of pressure reducing valve.

B. Built-in thermal expansion bypass check valve.

C. Approved Manufacturers:
   1. Watts U5B or equal by
   2. Cash Valve
   3. Clayton Valve
   4. Spencer
   5. Thrush
   6. Wilkins

2.7 DOMESTIC WATER PRESSURE REGULATOR

A. Bronze body

B. Bronze trim

C. Heat resistant seat and diaphragm

D. Built-in monel strainer with separate cleanout plug

E. Stainless steel body seat

F. Screwed ends.

G. Install with manual shutoff valve on each side and 3/4" bypass line with gate valve.

H. Provide 0-200 psi pressure gauge on each side.

I. Approved Manufacturers:
   1. Cash-Acme Type E
   2. or approved equal

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install piping under slabs without joints where possible.

B. Locate cold water lines a minimum of 6 inches from hot water line.

C. Run main water pipe and branches to all fixtures.

D. Size piping as shown.

E. Run piping direct and concealed from view, unless otherwise shown.

F. Grade horizontal runs to allow for drainage.

G. Provide sufficient drains to draw water from entire domestic water system and sections thereof where cutoffs are shown.

H. Furnish and install complete hot and/or cold water to all fixtures as shown on drawings.

I. Run lines parallel to each other and parallel with the lines of the building.

J. Cut pipes accurately to required measurements and work into place without springing or forcing.

K. Provide for expansion and contraction of piping.

L. Paint exposed threads on underground piping one coat asphaltum varnish.

3.2 FIELD QUALITY CONTROL

A. Before pipes are covered, test systems in presence of Architect at 100 psi hydrostatic pressure for two hours and show no leaks.

B. Sterilize potable water system with solution containing 250 parts per million minimum of available chlorine. Introduce chlorinating materials into system in manner approved by Architect. Allow sterilization solution to remain for 24 hours and open and close valves and faucets several times during that time.

C. After sterilization, flush solution from system with clean water until residual chlorine content is less than 0.2 parts per million.

D. Water system will not be accepted until negative bacteriological test is made on water taken from system. Repeat dosing as necessary until such negative test is accomplished.

END OF SECTION

DOMESTIC WATER PIPING SYSTEMS (PEX)

SECTION 22 11 17

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes ASTM F877 cross-linked polyethylene (PEX) tubing hot and cold-water distribution systems, ASTM F876 cross-linked polyethylene (PEX) tube, ASTM F1807 fittings and ASTM F2159 fittings

1.2 REFERENCES

A. ASTM International
   1. ASTM E84 Standard Test Method for Surface Burning Characteristics ofBuilding Materials.
   2. ASTM F876 Standard Specification for Cross-linked Polyethylene (PEX) Tubing.
   3. ASTM F877 Standard Specification for Cross-linked Polyethylene (PEX) Plastic Hot and Cold-Water Distribution Systems
   4. ASTM F1807 Standard Specification for Metal Insert Fittings Utilizing a Copper Crimp Ring for SDR9 Cross-linked Polyethylene (PEX) Tubing
   5. ASTM F2159 Standard Specification for Plastic Insert Fittings Utilizing a Copper Crimp Ring for SDR9 Cross-linked Polyethylene (PEX) Tubing

B. National Sanitation Foundation (NSF)
   1. Standard 14 Plastics Piping System Components and Related Materials
   2. Standard 61 Drinking Water System Components – Health Effects

C. International Code Council (ICC)
   1. International Mechanical Code
   2. International Plumbing Code

D. International Association of Plumbing Officials (IAPMO)
   1. Uniform Plumbing Code
   2. Uniform Mechanical Code

E. Plastic Pipe Institute (PPI)
   1. Technical Report TR-3 Policies and Procedures for Developing Recommended Hydrostatic Design Stresses for Thermoplastic Pipe Materials.
   2. Technical Report TR-4 Recommended Hydrostatic Strengths and Design Stresses for Thermoplastic Piping and Fitting Compounds

1.3 SYSTEM DESCRIPTION

A. Design Requirements
   1. Standard Grade hydrostatic pressure ratings from the Plastic Pipe Institute in accordance with TR-3 and listed in TR-4. The following three standard-grade hydrostatic ratings are required;
      a. 200 degrees F at 80 psi
      b. 180 degrees F at 100 psi
      c. 73 degrees F at 160 psi

2. Tubing tested in general accordance with ASTM E84 for a flame spread/smoke developed index of 25/50 or less for the following PEX tube sizes encased with ½ inch fiberglass insulation;
    a. 1 ¼ inch
    b. 1 ½ inch
    c. 2 inch
3. Tubing tested in general accordance with ASTM E84 for a flame spread/smoke developed index of 25/50 or less for the following PEX tube sizes;
    a. 3/8 inch
    b. ½ inch
    c. 5/8 inch
    d. ¾ inch
    e. 1 inch

B. Performance Requirements
1. To provide a PEX tubing hot and cold potable water distribution system, which is manufactured, fabricated and installed to comply with regulatory agencies and to maintain performance criteria stated by thePEX tubing manufacturer without defects, damage or failure
    a. Comply with NSF Standard 14
    b. Comply with NSF Standard 61
    c. Show compliance with ASTM F877

1.4 SUBMITTALS

A. General
1. Upon request, submit listed submittals in accordance with Conditions of the Contract and Division 1 Submittal Procedures Section

B. Product Data
1. Upon request, submit manufacturer's product submittal data and installationinstructions
2. Upon request, submit manufacturer's Professional Installation Limited Warranty

C. Shop Drawings
1. Upon request, provide installation drawings indicating tubing layout, manifold locations, plumbing fixtures supported and schedules with details required for installation of the system

D. Samples
1. Upon request, submit selection and verification samples of piping

E. Listing Certifications
1. Upon request, submit manufacturers third party listings

1.5 QUALITY ASSURANCE

A. Installer Qualifications
1. Utilize an installer having demonstrated experience on projects of similar size and complexity and possesses the skills and knowledge to install a PEX potable water distribution system
2. Installer will utilize skilled workers holding a trade qualification license or equivalent or apprentices under the supervision of a licensed tradesperson

B. Pre-installation Meetings

1. Verify project timeline requirements
2. Manufacturer's installation instruction
3. Manufacturer's warranty requirements

1.6 DELIVERY, STORAGE AND HANDLING

A. General
   1. Comply with Division 1 Product Requirement Section

B. Delivery
   1. Deliver materials in manufacture's original, unopened, undamaged containerswith identification labels intact until ready for installation

C. Storage and Protection
   1. Store materials protected from exposure to harmful environmental conditions and at temperature and humidity conditions recommended by the manufacturer
   2. Store PEX tubing indoors, in cartons or under cover to avoid dirt or foreign material from entering the tubing
   3. Do not expose PEX tubing to direct sunlight for more than six months. Ifconstruction delays are encountered, cover the tubing that is exposed to direct sunlight

1.7 WARRANTY

A. Project Warranty
   1. Refer to Conditions of the Contract for project warranty provisions

B. Manufacturer's Warranty
   1. Shall cover the repair or replacement of properly installed tubing and fittings proven defective as well as incidental damages
   2. Warranty period for PEX tubing and subsequent system shall be 25-year non-prorated warranty against failure due to defect in material or workmanship, beginning with the date of installation
   3. It is the installer's responsibility to avoid mixing fittings manufactured by others as it will reduce the owner's warranty

PART 2 - PRODUCTS

2.1 PRODUCT MANUFACTURERS

A. Zurn

B. Uponor

C. Vanguard

D. Rehau

E. Viega

2.2 MATERIALS

A. Tubing
   1. Cross-linked polyethylene (PEX).
   2. Non-barrier type.
      a. Shall have a pressure and temperature rating of 160 PSI at 73°F, 100 PSI at 180°F and 80 PSI at 200°F.
      b. Tubing shall have a minimum of 6 months UV protection.

3. Manufactured in accordance with ASTM F876 and ASTM F877 and testedfor compliance by an independent third-party agency.

B. Fittings
   1. Manufactured in accordance with ASTM F1807 or ASTM F2159 and/or complywith ASTM F877 system standard as identified on the fitting

C. Manifold
   1. Preassembled Manifold
   2. Copper Manifold System
   3. Multi Port Fittings
   4. Copper Manifold Header

D. Valves
   1. Shall be of the metal type, meeting the requirements of ASTM F877, identified assuch with the appropriate mark on the product

PART 3 - EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

A. A. Comply with manufacture's product data, including product technical bulletins, technical memo's, installation instructions and design drawings.

3.2 EXAMINATION

A. Site Verification of Conditions
   1. Verify that site conditions are acceptable for the installation of the PEX potable water system
   2. Do not proceed with installations of the PEX potable water system until unacceptable conditions are corrected

3.3 INSTALLATION

A. Install PEX tubing in accordance with tubing manufacturer's recommendations and as indicated in the PEX Plumbing Installation Guide

B. Do not install PEX tubing within 6 inches of gas appliance vents or within 12 inches of any recessed light fixtures

C. Do not solder within 18 inches of PEX tubing in the same waterline. Make sweat connections prior to making PEX connections

D. Ensure no glues, solvents, sealants or chemicals come in contact with the tubing without prior permission from the tubing manufacturer

E. Do not expose PEX tubing to direct sunlight for more than 6 months

F. Use grommets or sleeves at the penetration for PEX tubing passing through metal studs

G. Use a PEX manufacturer recommended fire stop sealant manufacturer

H. Protect PEX tubing with sleeves where abrasion may occur

I. Use nail plates where PEX tubing penetrates wall stud or joists and has the potential for being struck with a screw or nail

J. Allow slack of approximately 1/8 inch per foot of tube length to compensate for expansion and contraction

K. Minimum horizontal supports are to be installed not less than 32 inches between hangers in accordance with model plumbing codes.

L. Pressurize PEX tubing in accordance with applicable codes or in the absence of applicable codes, test pressure shall be at least equal to normal system working pressure, but not less than 40 PSI water or air and not greater than 225 PSI water, 125 PSI air

3.4 FIELD QUALITY CONTROL

A. Site Tests
   1. To ensure system integrity, pressure test the system before covering tubing in concrete and after other trades have worked in the vicinity of the tubing
   2. Repair and replace any product that has been damaged according to manufacturer's recommendation

3.5 PROTECTION

A. Protect installed work from damage due to subsequent construction activity on the site

END OF SECTION

SOIL, WASTE, & VENT PIPING SYSTEMS

SECTION 22 13 13

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings, General Provisions of Contract, including General and Supplementary Conditions and Section 22 05 01 apply to this Section.

1.2 SUMMARY

A. Furnish and install soil, waste, and vent piping systems within building and connectwith outside utility lines 5 feet out from building where applicable.

B. Perform excavation and backfill required by work of this Section.

PART 2 - PRODUCTS

2.1 BURIED LINES

A. Service weight, single-hub type cast iron soil pipe and fittings meeting requirements of ASTM A 74-87, "Specification for Cast Iron Soil Pipe & Fittings".
   1. Joint Material:
      a. Rubber gaskets meeting requirements of ASTM C 564-88, "Specification for Rubber Gaskets for Cast Iron Soil Pipe and Fittings".
      b. No hub stainless steel clamps with neoprene gasket.

B. ABS-DWV or PVC-DWV plastic waste pipe and fittings as permitted by state and local plumbing code.

2.2 ABOVE GRADE PIPING & VENT LINES

A. Same as specified for buried lines except no-hub pipe may be used.

B. Vent lines 2-1/2 inches or smaller may be Schedule 40 galvanized steel.

C. Joint Material:
   1. Bell & Spigot Pipe - rubber gaskets meeting requirements of ASTM C 564-88, "Specification for Rubber Gaskets for Cast Iron Soil Pipe and Fittings".
   2. No-Hub Pipe - Neoprene gaskets with stainless steel cinch bands.
   3. Galvanized Pipe - Screwed Durham tarred drainage fittings, or Victaulic.
   4. ABS-DWV solvent weld fittings

2.3 TRAP PRIMERS

A. Components:
   1. Drains And Drain Accessories:
      a. Floor Drain FD-1:
         1) Approved types with deep seal trap and chrome plated strainer.
         2) Provide trap primer connection and trap primer equal to Sioux Chief 695-01.
         3) Category Four Approved Products. See Section 01 6200 for definitions of Categories:
            a) Josam: 30000-50-Z-5A.

b) J. R. Smith: 2010-A.
c) Sioux Chief: 832.
d) Wade: 1100.
e) Watts: FD-200-A.
f) Zurn: Z-415.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Do not caulk threaded work.

B. Slope horizontal pipe at 1/4 in/ft.

C. Cleanouts:
1. Provide and set full size cleanouts at foot of each riser, and ends of branches from toilets, at points where a change of direction occurs, on exposed and accessible traps, at points where required to remove rust accumulation or other obstructions and as shown on plans. Set screw cap in cleanout with graphite paste. Cleanouts in walls shall be flush and covered with a chrome plated cleanout cover screwed into the cleanout plug. Cleanouts in floors shall be flush using Zurn, Josam, or Wade floor level cleanout fittings. Location of all cleanouts subject to approval of inspector.

D. Each fixture and appliance discharging water into sanitary sewer or building sewer lines shall have seal trap in connection with complete venting system so gasses pass freely to atmosphere with no pressure or syphon condition on water seal.

E. Vent entire waste system to atmosphere. Discharge 14 inches above roof. Join lines together in fewest practicable number before projecting above roof. Set back vent lines so they will not pierce roof near edge or valley.

F. Use torque wrench to obtain proper tension in cinch bands when using hubless cast iron pipe. Butt ends of pipe against centering flange of coupling.

G. Flash pipes passing through roof with 16 oz sheet copper flashing fitted snugly around pipes and calk between flashing and pipe with flexible waterproof compound. Flashing base shall be at least 24 inches square.
1. Flashing may be 4 lb per sq ft lead flashing fitted around pipes and turned down into pipe 1/2 inch with turned edge hammered against pipe wall.

3.2 FIELD QUALITY CONTROL

A. Before piping is covered, conduct tests for leaks and defective work. Notify Architect prior to testing. Correct leaks and defective work. Fill waste and vent system to roof level with water, 10 feet minimum, and show no leaks for two hours.

END OF SECTION

PLUMBING FIXTURES

SECTION 22 40 01

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings, General Provisions of Contract, including General and Supplementary Conditions and Section 22 0501 apply to this Section.

1.2 SUMMARY

A. Furnish and install plumbing fixtures as described in Contract Documents.

B. Before fixtures are ordered, the Contractor shall submit a complete list of plumbing fixtures, giving the catalog number, cut and make, for approval. Fixtures shall not be ordered until this list is approved.

PART 2 - PRODUCTS

2.1 GENERAL

A. Interior exposed pipe, valves, and fixture trim shall be chrome plated.

B. Do not use flexible water piping.

C. Flow Control Fittings:

1. Vandal proof type and fit faucet spout of fixture used. Flow shall be controlledas required by local codes.

D. Furnish and install the necessary plumbing fixtures in quantity as shown on plans. Provide all necessary valves, chrome plated 17 gauge or cast "P" traps, stops with risers, fittings, and accessories to make the job complete with the fixtures specified on the drawings. Exposed stops to be equal to Brasscraft with compression inlet, chrome plated nipples, cross handles, ¼ turn ball valves and flexible risers.

E. Fixtures shall be PROFLO, Kohler, Crane, Briggs, Eljer, American Standard, or anapproved equal. Specialties shall be Zurn, Josam, MiFab, J. R. Smith, Wade, or Watts.

F. Toilet seat manufacturers shall be Beneke, Church, Olsonite, or Bemis.

G. Carrier and wall hydrant manufacturers shall be Smith, Zurn, Wade, Josam, or Watts.

H. Stainless steel sink manufacturers shall be Elkay or Just.

I. Pressure balance mixing valves shall be Powers, Lawler, Leonard, or Symmons.

J. Thermostatic mixing valves shall be Powers.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install fixtures including traps and accessories with accessible stop or control valve in each hot and cold-water branch supply line.

B. Mounting – Refer to Architectural Elevations:
   1. Urinals:
      a. Standard - 20 inches from floor to bottom lip.
      b. Handicap - 17 inches from floor to bottom lip.

C. Make fixture floor connections with approved brand of cast iron floor flange, soldered or calked securely to waste pipe.

D. Make joints between fixtures and floor flanges tight with approved fixture setting compound or gaskets.

E. Caulk between fixtures and wall and floor with white butyl rubber non-absorbent caulking compound. Point edges.

F. Cleanouts: Provide and set full size cleanouts at foot of each riser, and ends of branches from toilets, at points where a change of direction occurs, on exposed and accessible traps, at points where required to remove rust accumulation or other obstructions and as shown on plans. Set screw cap in cleanout with graphite paste. Location of all cleanouts subject to approval of inspector.

G. Traps: Install "P" traps in branch lines from floor drains or where required. Traps installed in connection with threaded pipe shall be recess drainage pattern. Traps installed in connection with cast iron pipe shall be of the same quality and grade as the pipe. Traps installed in connection with fixtures shall have a seal of not less than 2" nor more than 4". Exposed traps shall be chrome plated cast brass or chrome plated 17-gauge tubular type. Provide trap primers as required by Code.

3.2 FIXTURE INSTALLATION

A. Provide stop valves and 18" minimum air chambers on all water connections to fixtures. Furnish and install wall carriers for wall mounted fixtures, wood backing, where necessary, to be installed by General Contractor at the direction of this Contractor. Provide exact locations, including proper mounting heights, obtained from details on drawings and from manufacturer's specifications. Provide hudee rims for countertop installations.

B. Interior exposed pipe, valves, and fixtures trim shall be chrome plated.

C. Complete installation of each fixture including trap and accessories with accessible stop or control valve in each hot and cold-water branch supply line. Make fixture floor connections with approved brand of cast iron floor flange, soldered or caulked securely to waste pipe. Make joint between fixture and floor flange tight with approved fixture setting compound or gaskets.

D. Polish chrome finish at completion of project.

E. Caulk between fixtures and wall and floor with white butyl rubber non-absorbent caulking compound. Paint all edges.

F. Install fixtures and fittings as per local codes and manufacturer's instructions.

END OF SECTION

DIVISION 23: HEATING, VENTILATING, AND AIR-CONDITIONING

23 00 00 HEATING, VENTILATING, AND AIR-CONDITIONING

END TABLE OF CONTENTS

COMMON HVAC REQUIREMENTS

SECTION 23 05 01

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Furnish labor, materials, and equipment necessary for completion of work as described in Contract Documents.

B. It is the intent of these specifications that the systems specified herein are to be complete and operational before being turned over to the owner. During the bidding process, the contractor is to ask questions or call to the engineer's attention any items that are not shown or may be required to make the system complete and operational. Once the project is bid and the contractor has accepted the contract, it is his responsibility to furnish and install all equipment and parts necessary to provide a complete and operational system without additional cost to the owner.

C. Furnish and install fire stopping materials to seal penetrations through fire rated structures and draft stops.

D. Includes But Not Limited To:
   1. General procedures and requirements for HVAC.

E. Related Sections:
   1. Section 23 0593: Testing, Adjusting, and Balancing for HVAC.

1.3 SUBMITTALS

A. Substitutions: By specific designation and description, standards are established for specialties and equipment. Other makes of specialties and equipment of equal quality will be considered provided such proposed substitutions are submitted to the Architect for his approval, complete with specification data showing how it meets the specifications, at least 5 working days prior to bid opening. A list of approved substitutions will be published as an addendum.
   1. Submit a single copy of Manufacturer's catalog data including Manufacturer's complete specification for each proposed substitution.
   2. The Architect or Engineer is to be the sole judge as to the quality of any material offered as an equal.

B. Product Data, Shop Drawings: Within 30 days after award of contract, submit 10 sets of Manufacturer's catalog data for each manufactured item.
   1. Literature shall include enough information to show complete compliancewith Contract Document requirements.
   2. Mark literature to indicate specific item with applicable data underlined.
   3. Information shall include but not be limited to capacities, ratings, type of material used, guarantee, and such dimensions as are necessary to check space requirements.

4. When accepted, submittal shall be an addition to Contract Documents andshall be in equal force. No variation shall be permitted.
5. Even though the submittals have been accepted by the Engineer, it does not relieve the contractor from meeting all of the requirements of the plans and specifications and providing a complete and operational system.

C. Drawings of Record: One complete sets of blue line mechanical drawings shall be provided for the purpose of showing a complete picture of the work as actually installed.
1. These drawings shall serve as work progress report sheets. Contractor shall make notations neat and legible therein daily as the work proceeds.
2. The drawings shall be kept at the job at a location designated by the Mechanical Engineer.
3. At completion of the project these "as-built" drawings shall be signed by the Contractor, dated, and returned to the Architect.

D. Operating Instructions and Service Manual: The Mechanical Contractor shall prepare 2 copies of an Operation and Maintenance Manual for all mechanical systems and equipment used in this project. Manuals shall be bound in hard-backed binders and the front cover and spine of each binder shall indicate the name and location of the project. Use plastic tab indexes for all sections. Provide a section for each different type of equipment item. The following items shall be included in the manual, together with any other pertinent data. This list is not complete and is to be used as aguide.
1. Provide a master index at the beginning of the manual showing all items included.
2. The first section of the manual shall contain:
   a. Names, addresses, and telephone numbers of Architect, Mechanical Engineer, Electrical Engineer, General Contractor, PlumbingContractor, Sheet Metal Contractor, and Temperature Control Contractor.
   b. List of Suppliers which shall include a complete list of each piece of equipment used with the name, address, and telephone number ofvendor.
   c. General Description of Systems including –
      1) Location of all major equipment
      2) Description of the various mechanical systems
      3) Description of operation and control of the mechanical systems
      4) Suggested maintenance schedule
   d. Copy of contractor's written warranty
3. Provide a copy of approved submittal literature for each piece of equipment.
4. Provide maintenance and operation literature published by the manufacturer for each piece of equipment which includes: oiling, lubrication and greasing data; belt sizes, types and lengths; wiring diagrams; step-by-step procedure to follow in putting each piece of mechanical equipment in operation.
5. Include parts numbers of all replaceable items.
6. Provide control diagram and operation sequence, along with labeling of control piping and instruments to match diagram.
7. Include a valve chart indicating valve locations.

E. Include air balance and/or water balance reports.

1.4 SUBMITTALS FOR COMMON HVAC REQUIREMENTS

A. Samples: Sealer and gauze proposed for sealing ductwork.

B. Quality Assurance / Control:
1. Manufacturer’s installation manuals providing detailed instructions on assembly, joint sealing, and system pressure testing for leaks.

2. Specification data on sealer and gauze proposed for sealing ductwork.

C. Quality Assurance
1. Requirements: Construction details not specifically called out in Contract Documents shall conform to applicable requirements of SMACNA HVAC Duct Construction Standards.
2. Pre-Installation Conference: Schedule conference immediately before installation of ductwork.

1.5 QUALITY ASSURANCE

A. Requirements of Regulatory Agencies:
1. Perform work in accordance with applicable provisions of local and state Plumbing Code, Gas Ordinances, and adoptions thereof. Provide materials and labor necessary to comply with rules, regulations, and ordinances.
2. In case of differences between building codes, state laws, local ordinances, utility company regulations, and Contract Documents, the most stringent shall govern. Promptly notify Architect in writing of such differences.

B. Applicable Specifications: Referenced specifications, standards, and publications shall be of the issues in effect on date of Advertisement for Bid.
1. "Heating, Ventilating and Air Conditioning Guide" published by the American Society of Heating and Air Conditioning Engineers.
2. "Engineering Standards" published by the Heating, Piping, andAir Conditioning Contractors National Association.
3. "2015 International Building Code", "2015 International Mechanical Code", “2015 International Plumbing Code” and "2015 International Fire Code" as published by the International Conference of Building Officials.
4. "National Electrical Code" as published by the National Fire Protection Association.
5. "2015 International Energy Conservation Code ".

C. Identification: Motor and equipment name plates as well as applicable UL and AGA labels shall be in place when Project is turned over to Owner.

1.6 INSPECTIONS AND PERMITS

A. Pay for permits, fees, or charges for inspection or other services. Local and state codes and ordinances must be properly executed without expense to Owner and are considered as minimum requirements. Local and state codes and ordinances do not relieve the Contractor from work shown that exceeds minimum requirements.

1.7 ADDITIONAL WORK:

A. Design is based on equipment as described in the drawing equipment schedule. Any change in foundation bases, electrical wiring, conduit connections, piping, controls and openings required by alternate equipment submitted and approved shall be paid for by this division. All work shall be in accordance with the requirements of the applicable sections.

PART 2 - PRODUCTS FOR COMMON HVAC REQUIREMENTS

A. Finishes, Where Applicable: Colors as selected by Architect.

B. Duct Hangers:

1. One inch 25 mm by 18 ga 1.27 mm galvanized steel straps or steel rods as shown on Drawings, and spaced not more than 96 inches 2 400 mm apart. Do not use wire hangers.
2. Attaching screws at trusses shall be 2-inch 50 mm No. 10 round head wood screws. Nails not allowed.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Site Inspection:
   1. Examine premises and understand the conditions which may affect performance of work of this Division before submitting proposals for this work.
   2. No subsequent allowance for time or money will be considered for any consequence related to failure to examine site conditions.

B. Drawings:
   1. Mechanical drawings show general arrangement of piping, ductwork, equipment, etc, and do not attempt to show complete details of building construction which affect installation. This Contractor shall refer to architectural, structural, and electrical drawings for additional building detail which affect installation of his work.
      a. Follow mechanical drawings as closely as actual building construction and work of other trades will permit.
      b. No extra payments will be allowed where piping and/or ductwork must be offset to avoid other work or where minor changes are necessary tofacilitate installation.
      c. Everything shown on the mechanical drawings shall be the responsibility of Mechanical Contractor unless specifically noted otherwise.
   2. Consider architectural and structural drawings part of this work insofar as these drawings furnish information relating to design and construction of building. These drawings take precedence over mechanical drawings.
   3. Because of small scale of mechanical drawings, it is not possible to indicate all offsets, fittings, and accessories which may be required. Investigate structural and finish conditions affecting this work and arrange work accordingly, providing such fittings, valves, and accessories required to meet conditions. Do not scale drawings for locations of equipment or piping. Refer to large scale dimensioned drawings for exact locations.

C. Insure that items to be furnished fit space available. Make necessary field measurements to ascertain space requirements including those for connections and furnish and install equipment of size and shape so final installation shall suit true intent and meaning of Contract Documents.
   1. If approval is received to use other than specified items, responsibility for specified capacities and insuring that items to be furnished will fit spaceavailable lies with this Division.
   2. If non-specified equipment is used and it will not fit job site conditions, this Contractor assumes responsibility for replacement with items named in Contract Documents.

3.2 PREPARATION

A. Cut carefully to minimize necessity for repairs to existing work. Do not cut beams, columns, or trusses.

1. Patch and repair walls, floors, ceilings, and roofs with materials of same quality and appearance as adjacent surfaces unless otherwise shown. Surface finishes shall exactly match existing finishes of same materials.
2. Each Section of this Division shall bear expense of cutting, patching, repairing, and replacing of work of other Sections required because of its fault, error, tardiness, or because of damage done by it.
3. Cutting, patching, repairing, and replacing pavements, sidewalks, roads, and curbs to permit installation of work of this Division is responsibility of Section installing work.

3.3 INSTALLATION

A. Arrange pipes, ducts, and equipment to permit ready access to valves, unions, traps, starters, motors, control components, and to clear openings of doors and access panels.

3.4 STORAGE AND PROTECTION OF MATERIALS:

A. Provide storage space for storage of materials and assume complete responsibility for losses due to any cause whatsoever. Storage shall not interfere with traffic conditions in any public thoroughfare.

B. Protect completed work, work underway, and materials against loss or damage.

C. Close pipe openings with caps or plugs during installation. Cover fixtures and equipment and protect against dirt, or injury caused by water, chemical, or mechanical accident.

3.5 EXCAVATION AND BACKFILL

A. Perform necessary excavation of whatever substance encountered for proper layingof all pipes and underground ducts.
1. Excavated materials not required for fill shall be removed from site as directed by Engineer.
2. Excavation shall be carried low enough to allow a minimum coverage over underground piping of 5'-0" or to be below local frost level.
3. Excess excavation below required level shall be backfilled at Contractor's expense with earth, sand, or gravel as directed by Engineer. Tamp ground thoroughly.
4. Ground adjacent to all excavations shall be graded to prevent water running into excavated areas.

B. Backfill pipe trenches and allow for settlement.
1. Backfill shall be mechanically compacted to same density as surrounding undisturbed earth.
2. Cinders shall not be used in backfilling where steel or iron pipe is used.
3. No backfilling shall be done until installation has been approved by the Engineer.

3.6 COOPERATION

A. Cooperate with other crafts in coordination of work. Promptly respond when notified that construction is ready for installation of work under Division 23000. Contractor will be held responsible for any delays which might be caused by his negligence or failure to cooperate with the other Contractors or crafts.

3.7 SUPERVISION

A. Provide a competent superintendent in charge of the work at all times. Anyone found incompetent shall be removed at once and replaced by someone satisfactory, when requested by the Architect.

3.8 INSTALLATION CHECK:

A. An experienced, competent, and authorized representative of the manufacturer or supplier of each item of equipment indicated in the equipment schedule shall visit the project to inspect, check, adjust if necessary, and approve the equipment installation. In each case, the equipment supplier's representative shall be present when the equipment is placed in operation. The equipment supplier's representative shall revisit the project as often as necessary until all trouble is corrected and the equipment installation and operation is satisfactory to the Engineer.

B. Each equipment supplier's representative shall furnish to the Owner, through the Engineer, a written report certifying the following:
   1. Equipment has been properly installed and lubricated.
   2. Equipment is in accurate alignment.
   3. Equipment is free from any undue stress imposed by connecting piping or anchor bolts.
   4. Equipment has been operated under full load conditions.
   5. Equipment operated satisfactorily.

C. All costs for this installation check shall be included in the prices quoted by equipment suppliers.

3.9 CLEANING EQUIPMENT AND PREMISES

A. Properly lubricate equipment before Owner's acceptance.

B. Clean exposed piping, ductwork, equipment, and fixtures. Repair damaged finishes and leave everything in working order.

C. Remove stickers from fixtures and adjust flush valves.

D. At date of Substantial Completion, air filters shall be new, clean, and approved by Owner's representative.

E. Trap elements shall be removed during cleaning and flushing period. Replace trap elements and adjust after cleaning and flushing period.

3.10 TESTS

A. No piping work, fixtures, or equipment shall be concealed or covered until they have been inspected and approved by the inspector. Notify inspector when the work is ready for inspection.

B. All work shall be completely installed, tested as required by Contract Documents and the County ordinances and shall be leak-tight before the inspection is requested.

C. Tests shall be repeated to the satisfaction of those making the inspections.

D. Water piping shall be flushed out, tested at 100 psi and left under pressure of supply

main or a minimum of 40 psi for the balance of the construction period.

3.11 WARRANTEE

A. Contractor shall guarantee work under Division 23 to be free from inherent defects for a period of one year from acceptance.
   1. Contractor shall repair, revise or replace any and all such leaks, failure or inoperativeness due to defective work, materials, or parts free of charge for a period of one year from final acceptance, provided such defect is not due to carelessness in operation or maintenance.
   2. In addition, the Contractor shall furnish all refrigeration emergency repairs, emergency service and all refrigerant required due to defective workmanship, materials, or parts for a period of one year from final acceptance at no cost to the Owner, provided such repairs, service and refrigerant are not caused by lack of proper operation and maintenance.

B. In addition to warrantee specified in General Conditions, heating, cooling, and plumbing systems are to be free from noise in operation that may develop from failure to construct system in accordance with Contract Documents.

3.12 SYSTEM START-UP, OWNER'S INSTRUCTIONS

A. Off-Season Start-up
   1. If Substantial Completion inspection occurs during heating season, schedule spring start-up of cooling systems. If inspection occurs during cooling season, schedule autumn start-up for heating systems.
   2. Notify Owner 7 days minimum before scheduled start-up.
   3. Time will be allowed to completely service, test, check, and off-season start systems. During allowed time, train Owner's representatives in operation and maintenance of system.
   4. At end of off-season start-up, furnish Owner with letter confirming that above work has been satisfactorily completed.

B. Owner's Instructions
   1. Instruct building maintenance personnel and Owner Representative in operation and maintenance of mechanical systems utilizing Operation & Maintenance Manual when so doing.
   2. Minimum instruction periods shall be as follows –
      a. Mechanical - Four hours.
      b. Temperature Control - Four hours.
      c. Refrigeration - Two hours.
   3. Instruction periods shall occur after Substantial Completion inspection when systems are properly working and before final payment is made.
   4. None of these instructional periods shall overlap another.

3.13 PROTECTION

A. Do not run heat pump, air handling units, fan coil units, or other pieces of equipment used for moving supply air without proper air filters installed properly in system.

B. The mechanical systems are not designed to be used for temporary construction heat. If any equipment is to be started prior to testing and substantial completion, such equipment will be returned to new condition with full one-year warranties, from date of substantial completion after any construction use. This includes, but is not necessarily limited to: Equipment, filters, ductwork, fixtures, etc.

3.14 COMMON HVAC REQUIREMENTS:

A. INSTALLATION
   1. During installation, protect open ends of ducts by covering with plastic sheet tied in place to prevent entrance of debris and dirt.
   2. Make necessary allowances and provisions in installation of sheet metal ducts for structural conditions of building. Revisions in layout and configuration may be allowed, with prior written approval of Architect. Maintain required airflows in suggesting revisions.
   3. Hangers And Supports:
      a. Install pair of hangers close to each transverse joint and elsewhereas required by spacing indicated in table on Drawings.
      b. Install upper ends of hanger securely to floor or roof construction above by method shown on Drawings.
      c. Attach strap hangers to ducts with cadmium-plated screws. Use of pop rivets or other means will not be accepted.
      d. Where hangers are secured to forms before concrete slabs are poured, cut off flush all nails, strap ends, and other projections after forms areremoved.
      e. Secure vertical ducts passing through floors by extending bracing anglesto rest firmly on floors without loose blocking or shimming. Support vertical ducts, which do not pass-through floors, by using bands bolted to walls, columns, etc. Size, spacing, and method of attachment to vertical ducts shall be same as specified for hanger bands on horizontal ducts.

B. CLEANING
   1. Clean interior of duct systems before final completion.

END OF SECTION

IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT

SECTION 23 05 53

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings, General Provisions of Contract, including General and Supplementary Conditions and Section 23 0501 apply to this Section.

1.2 SUMMARY

A. Furnish and install identification of equipment and piping as described in Contract Documents.

B. Mechanical Contractor shall touch-up equipment where factory paint has been damaged. Repaint entire item where more than 20 percent of the surface isinvolved.

C. Primary painting of walls, ceilings, ductwork, piping and plenums is covered in the general painting section of these Contract Documents.

PART 2 - PRODUCTS

2.1 PAINT

A. Benjamin Moore Impervo or equivalent by Paint Manufacturer approved in Section 09 900.

B. Use appropriate primer.

2.2 LABELS

A. Black Formica with white reveal on engraving.

2.3 CODED BANDS

A. Using colored bands and arrows to indicate supply and return, with colored reflective tape, color code all piping installed in this contract at not more than 20-foot intervals, at equipment, at walls, etc., in accordance with ANSI Standards.

B. Approved Manufacturers:
   1. Seton
   2. Craftmark

2.4 PIPE IDENTIFICATION

A. In addition to the colored bands, stencil with black paint in 1/2-inch-high letters a symbol and directional arrow for all fluids handled or use Seaton coded and colored pipe markers and arrows to meet ANSI Standards.

2.5 EQUIPMENT IDENTIFICATION

A. Provide an engraved plastic plate for each piece of equipment stating the name of the item, symbol number, area served, and capacity. Label all control components with

plastic embossed mechanically attached labels. Sample:

1. Supply Fan SF-1 - North Classrooms
2. 10,000 CFM @ 2.5"

2.6 VALVE IDENTIFICATION

A. Make a list of and tag all valves installed in this work.
   1. Valve tags shall be of brass, not less than 1"x2" size, hung with brass chains.
   2. Tag shall indicate plumbing or heating service.

PART 3 - EXECUTION

3.1 APPLICATION

A. Engraved Plates:
   1. Identify thermostats and control panels in mechanical rooms, furnaces, boilers and hot water heating specialties, duct furnaces, air handling units, electric duct heaters, and condensing units with following data engraved and fastened to equipment with screws –
      a. Equipment mark noted on Drawings (i.e., SF-1)
      b. Area served (i.e., North Classrooms)
      c. Capacity (10,000 CFM @ 2.5)

B. Stenciling:
   1. Locate identifying legends and directional arrows at following points on each piping system –
      a. Adjacent to each item of equipment and special fitting.
      b. At point of entry and exit where piping goes through wall.
      c. On each riser and junction.
      d. Every 50 feet on long continuous lines.
   2. Gas, & Valve Identification –
      a. Identify specific pipe contents by stenciling pipe with written legendand placing of arrows to indicate direction of flow.

C. Painting:
   1. Background Color - Provide by continuous painting of piping.

Symbol	Name	Color
NG	Natural Gas	Yellow
AIR	Air	Blue

   2. Identification stenciling and flow arrows shall be following colors forproper contrast:

Arrows & ID Stenciling	Color Shade of Pipe
White	Red, Grays, & black
Black	Yellows, Oranges, Greens, & White

END OF SECTION

TESTING, ADJUSTING, AND BALANCING

SECTION 23 05 93

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Division 23 0501 - Common HVAC Requirements and Basic Mechanical Materials and Methods Sections apply to work of this section.

1.2 SUMMARY SCOPE

A. This Section includes TAB to produce design objectives for the following:
   1. Air Systems.
      a. Rooftop Units
      b. Exhaust Fans

1.3 SUBMITTALS

A. Agency Data:
   1. Submit proof that the proposed testing, adjusting, and balancing agency meets the qualifications specified below. The firm or individuals performing the work herein specified may not be the installing firm.

B. Engineer and Technicians Data:
   1. Submit proof that the Test and Balance Engineer assigned to supervise the procedures, and the technicians proposed to perform the procedures meet the qualifications specified below.

C. Procedures and Agenda: Submit a synopsis of the testing, adjusting, and balancing procedures and agenda proposed to be used for this project.

D. Sample Forms: Submit sample forms, if other than those standard forms prepared by the AABC or NEBB are proposed.

E. Certified Reports: Submit testing, adjusting, and balancing reports bearing the seal and signature of the Test and Balance Engineer. The reports shall be certified proof that the systems have been tested, adjusted, and balanced in accordance with the referenced standards; are an accurate representation of how the systems have been installed; are a true representation of how the systems are operating at the completion of the testing, adjusting, and balancing procedures; and are an accurate record of all final quantities measured, to establish normal operating values of the systems. Follow the procedures and format specified below.
   1. Draft Reports: Upon completion of testing, adjusting, and balancing procedures, prepare draft reports on the approved forms. Draft reports may be hand written, but must be complete, factual, accurate, and legible. Organize and format draft reports in the same manner specified for the final reports. Submit 2 complete sets of draft reports. Only 1 complete set of draft reports will be returned.
   2. Final Report: Upon verification and approval of draft reports, prepare final reports, type written, and organized and formatted as specified below. Submit 4 complete sets of final reports.
   3. Report Format: Report forms shall be those standard forms prepared by the referenced standard for each respective item and system to be tested, adjusted, and balanced. Bind report forms complete with schematic systems diagrams and

other data. Divide the contents of the binder into the below listed divisions, separated by divider tabs:
a. General Information and Summary
b. Air Systems
c. Temperature Control System Verification.

F. Report Contents: Provide the following minimum information, forms, and data:
1. General information and Summary: Inside cover sheet to identify testing, adjusting, balancing agency, Contractor, Owner, Engineer, and Project. Include addresses and contact names and telephone numbers. Also include a certification sheet containing the seal and name, address, telephone number, and signature of the Certified Test and Balance Engineer. Include in this division a listing of the instrumentation used for the procedures along with the instrument calibration sheet.
2. The remainder of the report shall contain the appropriate forms containing as a minimum, the information indicated on the standard report forms prepared by the AABC or NEBB, for each respective item and system. Prepare a schematic diagram for each item of equipment and system to accompany each respective report form. The report shall contain the following information, and all other data resulting from the testing, adjusting, and balancing work:
a. All nameplate and specification data for all air handling equipment and motors.
b. Actual metered running amperage for each phase of each motor on all pumps and air handling equipment.
c. Actual metered voltage at air handling equipment (phase-to-phase for all phases).
d. Fan RPM for each piece of air handling equipment.
e. Total actual CFM being handled by each piece of air handling equipment.
f. Actual CFM of systems by rooms.
3. Certify that all smoke and fire dampers operate properly and can be reset under actual system operating conditions.

G. Calibration Reports:
1. Submit proof that all required instrumentation has been calibrated to tolerances specified in the referenced standards, within a period of six months prior to starting the project.

1.4 CERTIFICATION

A. Agency Qualifications:
1. Employ the services of a certified testing, adjusting, and balancing agency meeting the qualifications specified below, to be the single source of responsibility to test, adjust, and balance the building mechanical systems identified above, to produce the design objectives. Services shall include checking installations for conformity to design, measurement, and establishment of the fluid quantities of the mechanical systems as required to meet design specifications, recording, and reporting the results, and operation of all systems to demonstrate satisfactory performance to the owner.
2. The testing, adjusting, and balancing agency certified by National Environmental Balancing Bureau (NEBB) or Associated Air Balance Council (AABC) in those testing and balancing disciplines required for this project, and having at least one person certified by NEBB or AABC as a Test and Balance supervisor, and a registered professional mechanical engineer, licensed in the state where the work will be performed.

B. Codes and Standard:

1. NEBB: “Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems.”
2. AABC: “National Standards for Total System Balance.”
3. ASHRAE: ASHRAE Handbook, 1984 Systems Volume, Chapter 37, Testing, Adjusting, and Balancing.

1.5 PROJECT CONDITIONS

A. Systems Operation: Systems shall be fully operation and clean prior to beginning procedures.

1.6 SEQUENCING AND SCHEDULING

A. Test, adjust, and balance the air systems before hydronic, steam, and refrigerant systems within +10% to -5% of contract requirements.

B. The report shall be approved by the Engineer. Test and balance shall be performed prior to substantial completion.

PART 2 - NOT USED

PART 3 - EXECUTION

3.1 PRELIMINARY PROCEDURES FOR AIR SYSTEM BALANCING

A. Before operating the system, perform these steps.
1. Obtain design drawings and specifications and become thoroughly acquainted with the design intent.
2. Obtain copies of approved shop drawings of all air handling equipment, outlets (supply, return, and exhaust) and temperature control diagrams.
3. Compare design to installed equipment and field installations.
4. Walk the system from the system air handling equipment to terminal units to determine variations of installation from design.
5. Check filters for cleanliness and to determine if they are the type specified.
6. Check dampers (both volume and fire) for correct and locked position. Check automatic operating and safety controls and devices to determine that they are properly connected, functioning, and at proper operating setpoint.
7. Prepare report test sheets for both fans and outlets. Obtain manufacturer’s outlet factors and recommended procedures for testing. Prepare a summation of required outlet volumes to permit a cross-check with required fan volumes.
8. Determine best locations in main and branch ductwork for most accurate duct traverses.
9. Place outlet dampers in the full open position.
10. Prepare schematic diagrams of system “As-Built” ductwork and piping layouts to facilitate reporting.
11. Lubricate all motors and bearings.
12. Check fan belt tension.
13. Check fan rotation.

3.2 MEASUREMENTS

A. Provide all required instrumentation to obtain proper measurements, calibrated to the tolerances specified in the referenced standards. Instruments shall be properly maintained and protected against damage.

B. Provide instruments meeting the specifications of the referenced standards.

C. Use only those instruments which have the maximum field measuring accuracy and are best suited to the function being measured.

D. Apply instrument as recommended by the manufacturer.

E. Use instruments with minimum scale and maximum subdivisions and with scaleranges proper for the value being measured.

F. When averaging values, take a sufficient quantity of readings which will result in a repeatability error of less than 5%. When measuring a single point, repeat readings until 2 consecutive identical values are obtained.

G. Take all readings with the eye at the level of the indicated value to prevent parallax.

H. Use pulsation dampeners where necessary to eliminate error involved in estimating average of rapidly fluctuation readings.

I. Take measurements in the system where best suited to the task.

3.3 PERFORMING TESTING, ADJUSTING, AND BALANCING

A. Perform testing and balancing procedures on each system identified, in accordance with the detailed procedures outlined in the referenced standards. Balancing of the air systems and hydronic systems shall be achieved by adjusting the automatic controls, balancing valves, dampers, air terminal devices, and the fan/motor drives within each system.

B. Cut insulation, ductwork, and piping for installation of test probes to the minimum extent necessary to allow adequate performance of procedures.

C. Patch insulation, ductwork, and housings, using materials identical to those removed.

D. Seal ducts and piping, and test for and repair leaks.

E. Seal insulation to re-establish integrity of the vapor barrier.

F. Adjust timing relays of environmental equipment motor reduced voltage starters to the optimum time period for the motor to come up to the maximum reduced voltage speed and then transition to the full voltage speed to prevent damage to motor, and to limit starting current spike to the lowest possible and practical.

G. Mark equipment settings, including damper control positions, valve indicators, fan speed control levers, and similar controls and devices, to show final settings. Mark with paint or other suitable, permanent identification materials.

H. Retest, adjust, and balance systems subsequent to significant systemmodifications, and resubmit test results.

3.4 RECORD AND REPORT DATA

A. Record all data obtained during testing, adjusting, and balancing in accordance with, and on the forms recommended by the referenced standards, and as approved on the sample report forms.

B. Prepare report of recommendations for correcting unsatisfactory mechanical performances when system cannot be successfully balanced.

C. Report shall be certified and stamped by a registered professional mechanical engineer employed by the agency and licensed in the state where the work will be performed.

D. Engineer is to provide a floor plan and test and balance contractor to include the plan in test and balance report and identify actual cfm on drawing or number the diffusers to match report.

3.5 DEMONSTRATION

A. If requested, testing, adjusting, and balancing agency shall conduct any or all of the field tests in the presence of the engineer.

B. Agency shall include a maximum of one (1) call back to the project within the one-year warranty period to make additional adjustments if requested by the engineer.

END OF SECTION

MECHANICAL INSULATION AND FIRE STOPPING

SECTION 23 07 12

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings, General Provisions of Contract, including General and Supplementary Conditions and Section 23 0501 apply to this Section.

1.2 SUMMARY

A. Furnish and install mechanical insulation and fire stopping as described in Contract Documents including but not limited to the following:
   1. Ductwork Insulation
   2. Refrigerant Piping
   3. Fire Stopping

1.3 QUALITY ASSURANCE

A. Insulation shall have composite (insulation, jacket or facing and adhesive used to adhere facing or jacket to insulation) fire and smoke hazard ratings as tested by Procedure ASTM E-84, NFPA 255 and UL 723 not exceeding: Flame Spread of 25 and Smoke Developed of 50.

B. Insulation Contractor shall certify in writing, prior to installation, that all products to be used will meet the above criteria.

C. Accessories, such as adhesives, mastics, cements, and tapes, for fittings shall have the same component ratings as listed above.

D. Products, or their shipping cartons, shall bear a label indicating that flame and smoke ratings do not exceed above requirements.

E. Any treatment of jacket or facings to impart flame and smoke safety shall be permanent.

F. The use of water-soluble treatments is prohibited.

END OF SECTION

DUCTWORK INSULATION

SECTION 23 07 16

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings, General Provisions of Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, and Section 23 0501 apply to this Section.

1.2 SUMMARY

A. Furnish and install insulation on air ducts outside building insulation envelope as described in Contract Documents.

B. Furnish and install insulation on fresh air ducts and combustion air ducts within building insulation envelope as described in Contract Documents.

C. Furnish and install insulation on other air ducts where indicated on Drawings.

PART 2 - PRODUCTS

2.1 INSULATION

A. 1-1/2-inch-thick fiberglass with aluminum foil scrim kraft facing and have a density of one lb/cu ft.

B. Approved Manufacturers:
   1. Manville Microlite FSK
   2. CSG Type IV standard duct insulation
   3. Owens-Corning FRK
   4. Knauf (Duct Wrap FSK)

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install duct wrap in accordance with Manufacturer's recommendations.

B. Do not compress insulation except in areas of structural interference.

C. Completely seal joints.

END OF SECTION

ROUND SUPPLY DUCT INSULATION

SECTION 23 07 17

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings, General Provisions of Contract, including General and Supplementary Conditions and Section 23 0501 apply to this Section.

1.2 SUMMARY

A. Furnish and install round supply duct insulation as described in Contract Documents.

1.3 QUALITY ASSURANCE

A. Insulation shall be UL rated with FSK (foil-skrim-kraft) facing.

PART 2 - PRODUCTS

2.1 MANUFACTURED UNITS

A. Fiberglass blanket insulation

B. Approved Manufacturers:
   1. Johns-Manville R-4 Microlite (R-4 does not include the vapor barrier material).
   2. Owens-Corning faced duct wrap insulation FRK-25 ED-150
   3. Certainteed Standard Duct Wrap.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Insulate round air supply ducts.

B. Facing shall overlap 2" at joints and shall be secured with outward clinch staples on 4" centers.

C. Ducts over 30" in width shall have spot application of adhesive, weld pins or metal screws and caps on not more than 18" centers applied to underside.

D. 3" wide vapor barrier paper shall be applied over seams and sealed with vapor barrier adhesive.

E. Insulate attenuators.

F. Insulate high and low pressure flex ducts.

END OF SECTION

FIRE STOPPING

SECTION 23 08 00

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings, General Provisions of Contract, including General and Supplementary Conditions and Section 23 0501 apply to this Section.

1.2 SUMMARY

A. Furnish and install fire stopping as described in Contract Documents.

1.3 QUALITY ASSURANCE

A. Fire stopping material shall meet ASTM E814, E84 and be UL listed.

PART 2 - PRODUCTS

2.1 MANUFACTURED UNITS

A. Material shall be flexible, long lasting, intumescent acrylic seal toaccommodate vibration and building movement.

B. Caulk simple penetrations with gaps of 1/4" or less with:
   1. Dow Corning Fire Stop Sealant
   2. Pensil 300

C. Caulk multiple penetrations and/or penetrations with gaps in excess of 1/4" with:
   1. Dow Corning Fire Stop Foam
   2. Pensil 200
   3. IPC flame safe FS-1900
   4. Tremco “Tremstop 1A”

PART 3 - EXECUTION

3.1 INSTALLATION

A. Follow manufacturer's installation instructions explicitly.

B. Seal penetrations of ductwork, piping, and other mechanical equipment through one-hour and two-hour rated partitions as shown on Architectural and Mechanical Drawings.

C. Install fire stopping material on clean surfaces to assure adherence.

END OF SECTION

FLEX DUCT

SECTION 23 33 46

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings, General Provisions of Contract, including General and Supplementary Conditions and Section 23 0501 apply to this Section.

1.2 SUMMARY

A. Furnish and install supply air branch duct runouts to diffusers as described in Contract Documents.

PART 2 - PRODUCTS

2.1 DUCTS

A. Formable, flexible, circular duct which shall retain its cross-section, shape, rigidity, and shall not restrict air flow after bending.

B. Nominal 1-1/2 inches thick, 3/4 lb/cu ft density fiberglass insulation with air-tight, polyehtylene or polyester core, sheathed in seamless vapor barrier jacket factory installed over flexible assembly.

C. Assembly, including insulation and vapor barrier, shall meet Class I requirement of NFPA 90A and be UL 181 rated, with flame spread of 25 or less and smokedeveloped rating of 50 or under.

D. Length of flexible ductwork shall not exceed 8'-0".

2.2 APPROVED MANUFACTURERS

A. ANCO-FLEX - 4625

B. Flex-Aire - PF/UPC #090

C. Hart & Cooley - F114

D. Thermaflex - G-KM

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install duct in fully extended condition free of sags and kinks.

B. Make duct connections by coating exterior of duct collar for 3 inches with duct sealer and securing duct in place over sheet metal collar with 1/2-inch-wide metal cinch bands and sheet metal screws.

END OF SECTION

EXHAUST FANS

SECTION 23 34 00

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings, General Provisions of Contract, including General and Supplementary Conditions and Section 23 0501 apply to this Section.

1.2 SUMMARY

A. Furnish and install exhaust fans as described in Contract Documents.

1.3 QUALITY ASSURANCES

A. Requirements of Regulatory Agencies:
   1. Bear AMCA seal and UL label.

PART 2 - PRODUCTS

2.1 CEILING MOUNTED EXHAUST FANS

A. Acoustically insulated housings.

B. Sound level rating of 4.6 sones maximum for fan RPM and CFM listed on Drawings.

C. Include chatterproof integral back-draft damper with no metal-to-metal contact.

D. True centrifugal wheels.

E. Entire fan, motor, and wheel assembly shall be easily removable without disturbing housing.

F. Suitably ground motors and mount on rubber-in shear vibration isolators.

G. Provide wall or roof cap, as required.

H. Approved Manufacturers:
   1. Cook-Gemini
   2. Greenheck Sp
   3. Pace
   4. Penn Zephyr
   5. Twin City

PART 3 - EXECUTION

3.1 INSTALLATION

A. Anchor fan units securely to structure or curb.

END OF SECTION

AIR OUTLETS & INLETS

SECTION 23 37 13

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings, General Provisions of Contract, including General and Supplementary Conditions and Section 23 0501 apply to this Section.

1.2 SUMMARY

A. Furnish and install wall supply registers, transfer grilles, return air grilles, soffit grilles, ceiling diffusers, louvers connected to ductwork, and registers as described in Contract Documents.

PART 2 - PRODUCTS

2.1 GRILLES & REGISTERS

A. Approved Manufacturers:
   1. Price
   2. Anemostat
   3. Krueger
   4. Titus
   5. Tuttle & Bailey

2.2 SPIN-IN FITTINGS

A. Low pressure round take-offs to diffusers shall be made with spin-in fittings. They shall incorporate a manual balancing damper. The damper shall be spring loaded and a positive locking wing nut shall secure the damper position.

B. Approved Manufacturers:
   1. Sheet metal fittings: Genflex DB-1DEL, Hercules

PART 3 - EXECUTION

3.1 INSTALLATION

A. Anchor securely into openings.

B. Install with screws to match color and finish of grilles and registers.

C. Touch-up any scratched finish surfaces.

D. Install in accordance with manufacturer's instructions.

E. Check location of outlets and inlets and make necessary adjustments in position to conform with architectural features, symmetry, and lighting arrangement.

F. Install diffusers to ductwork with air tight connection.

G. Provide balancing dampers on duct take-off to diffusers, and grilles and registers,

despite whether dampers are specified as part of the diffuser, or grille and register assembly.

H. Paint ductwork visible behind air outlets and inlets matte black. Refer to Section 09 9000.

END OF SECTION

SECTION 26 00 00
ELECTRICAL SPECIFICATION

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. Furnish all necessary labor, materials, equipment and incidentals required to install a complete and operational electrical system according to the intent of this specification whether itemized or not.

B. Examine the specification for mechanical equipment and provide all starters, circuit breakers, switches, push-buttons and appurtenances which are not specified to be with the mechanical equipment. Erect all electrical equipment not definitely stated to be erected by others, furnish and install conduit, wire and cable and make connections required to place all equipment in complete operation.

C. The general extent of the electrical work includes, among others, the furnishing and installing of the following items:

1. Lighting and small power installation, including fixtures, receptacle outlets, switching and circuits as indicated on the drawings.

2. All supports, bases, anchors, sleeves, hangers and the like, all electrical work shown and/or specified, not particularly mentioned above.

I.02 CODES AND STANDARDS

A. All Work shall conform to the following codes:

1. NFPA 70 - National Electrical Code - 2017 Edition

2. 2019 Title 24, Part 3 – California Electrical Code (CEC)

3. 2019 Title 24, Part 2, Volume 1 & 2, California Building Code (CBC)

4. 2019 Title 24, Part 6, California Energy Code: Title 24, Part 9 (CEC)

5. 2019 California Green Building Standards Code (CGBC)

6. County Electrical Code as applicable

7. W.U.E.S.S.C. Standards

8. Occupational Safety and Health Act (OSHA) Standards

9. Any additional codes effective at the job site

B. Furnish without extra charge any additional material and labor which may be required for compliance with these laws, rules, and regulations, even though the work is not mentioned in these particular specifications.

C. Apply and pay for all permits required by any of the legally constituted public authorities for the installation or construction of the work included under this specification.

D. Arrange and pay for any inspections or examinations so required and deliver certificates of all such inspections to the Owner. When these specifications call for materials or construction of a better quality or larger sizes than required by the above mentioned rules and regulations, the provisions of the specifications shall take precedence.

I.03 DRAWINGS

A. Any error or omissions of detail in either the drawings or the specifications shall not relieve the Contractor from correctly installing all materials necessary for complete and operating electrical systems.

B. Any detail on either the drawings or specifications that contributes to an illegal condition shall not relieve the contractor's responsibility to bring this condition to the attention of the Architect or Engineer prior to installation. Failure of this responsibility shall require the contractor to remove all material affected by this condition and re-install legally. Any removal and re-installations will be done at the contractor's expense.

C. Inspect the site and verify all measurements and conditions and be responsible for the correctness of same. No extra compensation will be allowed because of differences between work shown on the drawings and measurements at the site.

D. All equipment shall be located and installed so that it will be readily accessible for operation and maintenance. The Owner reserves the right to require minor changes in location of outlets or equipment, prior to roughing in, without incurring any additional costs or charges.

1.04 INSPECTION

A. Cooperate with the Owner and provide assistance at all times for the inspection of the electrical work. Remove covers, operate machinery, or perform any reasonable work which, in the opinion of the Owner, will be necessary to determine the quality or adequacy of the work.

B. If any material does not conform with these specifications, remove the materials from the premises, within three days after being notified by the Owner.

C. Work shall not be closed in or covered before inspection and approval by the Owner.

1.05 QUALITY OF MATERIALS

A. All electrical materials used on this project shall be new and free from defects.
B. All electrical materials used on this project shall conform where applicable, to the following standards, unless otherwise noted:

1. NEMA - National Electrical Manufacturers Association

2. ANSI - American National Standards Institute

3. UL - Underwriters Laboratories, Inc.

C. Each type of material shall be of the same manufacturer and quality throughout the work.

1.06 SUBMITTAL & SHOP DRAWINGS

A. Shop drawings and supplemental data where called for, shall be prepared and submitted as per General Conditions.

B. Shop drawings and supplemental data are required unless specifically not requested by the Engineer. Shop drawings shall be submitted for all electrical equipment pertaining to job. (Lights, receptacles, conduit, wire, etc.)

1.7 EQUIPMENT IDENTIFICATION

A. All panelboards, disconnect switches, transformers, boxes, etc., shall be properly identified with a descriptive nameplate.

B. Provide holders with identification cards filled out on a typewriter of circuit designations for each new panelboard and existing panelboards as noted on plans.

C. Each branch circuit, control and signal conductor shall be labeled with the circuit number or terminal number it is connected to.

1.8 WARRANTY

A. Guarantee all work for one year from date of acceptance against all defects in material, equipment and workmanship.

PART 2 - PRODUCTS

2.01 RACEWAY AND FITTINGS

A. Rigid Steel Conduit:

1. Comply to Underwriter's Laboratories UL-6 specification, ANSI C80.1 and Federal specification WW-C-581E or latest revisions. Hot dip galvanized on the exterior, Zinc or enamel on the interior.

2. Couplings, locknuts, and all other fittings shall be galvanized, waterproof and threaded type only. Appleton, Crouse-Hinds or equal.

B. Intermediate Metallic Conduit (IMC):

1. Comply to proposed Underwriter's Laboratories UL 1242 and Federal Specification WW-C-581E or latest revision. Hot dipped galvanized on the exterior, corrosion inhibiting coating on the interior.

2. Couplings, locknuts, and all other fittings shall be galvanized, waterproof and threaded type only. Same material as conduit. Appleton, Crouse-Hinds or equal.

C. Electrical Metallic Tubing (EMT):

1. Comply to Underwriter's Laboratories UL 797, ANSI C80.3 and Federal Specification WW-C-563 or latest revisions. EMT shall be galvanized.

1. Couplings and connectors for EMT shall be galvanized or cadmium plated and shall be of the compression type requiring the tightening of a nut on a gland ring or an approved steel set screw type. Appleton, Crouse-Hinds or equal. No die cast type allowed.

D. Flexible Metallic Conduit:

1. Galvanized interlocked spirally wound steel strip.

2. Neoprene jacketed flexible metallic conduit shall be used in all moist or weatherproof locations where flexible conduit is required.

3. Fittings shall be hot dipped galvanized compression or clamp type. Fittings which use a screw to bind against tubing or which screw into the end of the conduit, will not be accepted. Fittings for neoprene jacketed flexible conduit shall be of the screw in type. Appleton STB Series. Appleton, Crouse-Hinds or equal may be used.

E. Polyvinylchloride (PVC): Rigid heavy weight type, Schedule 40, complete with PVC fittings.

F. Electrical Non-metallic Tubing (ENT): Electrical Non-metallic Tubing (ENT) is not permissible for use on this project.

G. Outlet Boxes: Galvanized steel. Boxes installed in any exterior location, where exposed to rain or where exposed to moisture laden atmosphere shall be cast screw hub type with gasketed weatherproof covers. Boxes for vapor proof or explosion proof applications shall be designed specifically for such use.

1. Each box shall be large enough to accommodate the required number and sizes of conduits, wires, splices and devices but not smaller than size shown or specified.

2.02 WIRE AND CABLE

A. Labeling:

Marked on 24 inch centers as follows:

1. Underwriters' Label
2. Gauge
3. Voltage
4. Kind of Insulation
5. Name of Manufacturer
6. Trade Name

B. Insulation:

1. All conductors No. 10 and smaller shall be 600 Volt, 90 degrees Celsius, type THWW/THHN or XHHW except as noted otherwise.

2. All conductors No. 8 and larger shall be 600 Volt, 75 degrees Celsius, type THWN/THHN or XHHW except as noted otherwise.

C. Conductors:

1. Unless specifically noted otherwise herein, all conductors for general wiring shall be a minimum of 98% conductivity, stranded, soft drawn copper.

2. Conductors for lighting and receptacle branch circuits No. 8 and smaller shall be similar to the above except solid copper may be used.

3. Except where noted on the plans or in this specification, the minimum conductor size for branch circuits shall be No. 12. Minimum size mechanical equipment control circuits where covered under this specification shall be No. 14.

4. Aluminum conductors are not allowed unless specifically called out for on drawings.

D. Pulling Lubricant: UL approved

2.03 WIRING DEVICES

A. Wall Switches:

1. Toggle type with 20A 120-277V. A.C. rating for full capacity of contacts for incandescent or fluorescent lamp loads. Switches shall be back and side wired, self grounding. Contacts shall be silver-cadmium oxide designed for quiet operation. Comply with Federal Specification W-S-896E with NEMA WD-1-3.02 and UL 20 tests or latest revisions. Color as selected by Architect or Owner.

2.

MAKE	TOGGLE	THREE-WAY	DOUBLE-POLE
Bryant	1221	1223	
Hubbell	1221	1223	1222
Leviton	1221	1223	1222

B. Convenience Outlets:

1. Grounding, 20 Ampere, 125 Volt, NEMA 5-20R configuration, Nylon housing, self grounding. Comply to Federal Specification W-C-596E, NEMA WD1-4.02 and UL 498 or latest revisions. Color as selected by Architect or Owner.

2.

MAKE	NUMBER
Bryant	5352
Leviton	5352
Hubbell	5352

2.04 LIGHTING FIXTURES AND ACCESSORIES

A. Manufacturer of Fixtures: All fixtures of one type shall be of one manufacturer and of identical finish and appearance.

B. Accessories: All fixtures shall be complete with accessories, end required for the specific installation.

C. It shall be the responsibility of the contractor to coordinate fixtures with ceiling types and supply voltages.

A. Fixtures installed in rated ceilings shall be listed for use in such ceilings.

2.05 DISCONNECT SWITCHES

A. Heavy duty type safety switches as manufactured by GE, Westinghouse, Cutler-Hammer, Gould or Square D. Furnish with enclosure suitable for application. Provide fused type where indicated or required by code.

PART 3 - INSTALLATION

3.01 RACEWAY INSTALLATION

A. Conduit Application:

1. Minimum size of conduit shall be ½ inch. In no case shall the conduit size be smaller than that shown on the drawings.

2. PVC conduit, minimum size 3/4", may only be installed beneath grade or in concrete; a maximum of 4 foot of PVC may be installed in electrical rooms or concealed in stud spaces when designated on plans. PVC shall not be installed in fire rated areas or where subject to mechanical damage. The PVC is to extend only from the concrete slab to the bottom of the switchboard, panelboard, or similar equipment.

3. All conduit runs exposed above grade and below 8 feet shall be rigid steel or IMC. Except as noted in conduit applications items 2 and 4.

4. Electrical metallic tubing may be installed in protected attic spaces and hollow stud spaces. It may be exposed on the surface of electrical and mechanical rooms where designated on the plans.

5. Flexible metallic conduit shall be used only where required for connection to motors, etc., or with the approval of the Owner where absolutely necessary due to structural conditions.

6. Boxes installed indoors or embedded in concrete shall be galvanized steel type. Boxes installed exposed or outdoors shall be galvanized cast steel with threaded hubs.

7. Branch circuit conduits under slab shall be separated by at least one inch. In all cases two or more conduits installed in a common concrete encasement shall be separated by at least three inches.

8. Conduit shall be securely fastened in place so that absolutely no shifting will occur during placing of concrete encasement.

9. Joints in all conduit installed in concrete, or exposed to weather, shall be liquid and gas tight.

B. Conduit Location:

1. All conduit shall be run concealed in all finished areas unless noted otherwise.

2. Exposed conduit shall be neatly installed parallel to or at right angles to the structural members.

3. Exposed conduit stubbing up through the floor into the bottom of exposed panels, cabinets or equipment shall be lined up, properly spaced and shall be straight and plumb. Conduits shall be installed at sufficient depth below the floor to eliminate any part of the bend above.

4. Maintain 12-inch separation between power and intercommunication cables.

5. Conduit shall be kept at least 6" from the covering on hot water pipes, and 18" from the covering on flues and breechings.

C. Conduit Support:

1. Conduit shall be supported with factory made pipe straps or suspended with pipe hangers or racks.

2. Hanger straps, rods, or pipe supports under wood shall be attached to the wood structure using bolts, lag bolts, or lag screws. Attach to trusses using beam clamps.

3. Conduits which are suspended on rods more than 2 feet long shall be rigidly braced to prevent horizontal motion or swaying.

4. Conduit shall be supported at intervals not exceeding 10 feet and in all cases with a support not more than 3 feet from the outlet and at any point where it changes in direction.

5. Conduit placed against concrete or masonry above ground shall be fastened to the concrete with pipe straps or one-screw conduit clamps attached to the concrete by means of expansion anchors and screws. Expanders and shields shall be steel or malleable iron. Sizes of shields and bolts shall be such that the proof test load will not be less than four times the actual working load.

D. Conduit Bends:

1. Field bends or off sets are permitted in 1 inch and smaller conduit only.

2. Elbows in 1-1/4-inch conduit and larger sizes shall be factory made.

3. Minimum radius bend for telephone service entrance conduit shall be 36".

4. Conduit bends, other than factory ells, shall have a radius of not less than 10 times the internal diameter of the conduit.

5. 90 Degree bends in PVC larger than 2 inches shall be steel.

6. Use of a blow torch to bend conduit is specifically prohibited.

E. Empty Conduits:

1. All conduits which are installed at this time and left empty for future use shall have a 3/16-inch polypropylene rope left in place for future use.

F. Conduit Protection:

1. Cap all conduit during construction by means of manufactured seals. Swab out all conduits before pulling in wire.

2. All conduit systems must be installed complete before conductors are pulled in.

G. Outlet Boxes:

1. Boxes must be accurately placed for finish, independently and securely supported by manufactured box hangers. Fixture outlets shall be located symmetrically.

2. Local switches shall be located +48 inches above the floor unless otherwise noted.

3. Convenience outlets shall be located +18 inches above the finished floor unless otherwise noted.

4. Changes in outlet locations of fixtures, wall switches, receptacles and special equipment found necessary due to interference with structure, pipes, ducts, etc. shall be reported to the Owner for approval.

5. All boxes shall be of proper code size for the number of wires or conduits passing through or terminating therein, but in no case shall any box be less than 4" square, unless specifically noted as smaller. Covers shall be of the types most suitable for the fixture or device used at the outlet and shall finish flush with plaster or other finished surface. Approved factory-made knockout seals shall be used in all boxes where knockouts are not intact. Boxes in concrete shall be a type which will allow the placing of conduit without displacing the reinforcing bars.

6. Outlet boxes shall be used as pull boxes wherever possible, and junction or pull boxes shall be installed only as required by the specifications, or as directed.

7. For light outlet boxes use minimum of 4" square, 1-1/2" deep, equipped with plaster ring and fixture supporting device as required by the unit.

8. For wall switch outlets, use 4" boxes with single or two gang plaster rings for one or two switches and solid gang boxes with gang plaster rings for more than two switches, unless noted otherwise on the drawings.

9. For convenience outlets, use 4" boxes with single gang plaster ring.

10. For telephone outlets, use 4" boxes with single gang plaster ring.

3.02 WIRE INSTALLATION

A. Cleaning: All debris and moisture shall be removed from raceways, boxes, and cabinets before installing wire or cable.

B. Pulling:

1. No oil, grease or similar substances shall be used to facilitate the pulling in of conductors. Use a UL approved wire pulling compound.

2. No wire or cable shall be pulled in until all construction which might damage insulation or fill conduit with foreign material is completed.

3. Wire shall be pulled into conduits with care to prevent damage to insulation. Use basket pulling grips to avoid slipping of insulation on conductors. Nylon rope or other "soft" surface cable must be used for pulling in conduits other than steel.

C. Connections:

1. Stranded conductors No. 8 and smaller shall be terminated with terminals of appropriate size where connected to screw type lugs.

2. Joints, splices and taps in dry locations for conductors No. 8 and smaller shall be made with twist on connectors suitably sized for the number and gauge of the conductors.

3. Furnish and install proper lugs in all panelboards, switchboards, and gutters as required to properly terminate every cable. Lugs for aluminum conductors shall be compression type.

4. Connections of aluminum cable to aluminum bus bars shall be made using all aluminum components (lugs, washer, bolts, nuts). Copper to aluminum connections of bus bars and lugs shall be made using belleville washers and flat washers to compensate for differing rates of thermal expansion.

5. Only crimping tools approved by the manufacturer of the terminals or lugs shall be used.

6. Splices in underground pull boxes or in other areas subject to moisture shall be provided with cast resin kits. Prepare all splices as hereinbefore specified before resin kits are applied.

3.03 LIGHTING FIXTURE INSTALLATION

A. Mounting: Unless specifically indicated otherwise, all lighting fixtures shall be placed symmetrically with respect to the ceiling tile pattern or other architectural ceiling and wall modules.

B. Support:

1. In suspended grid lay-in ceilings, in addition to supporting from ceiling tees, support all luminaire housings from structural members with a minimum of two No.12 galvanized wires for each 4-foot luminaire 18" or wider.

2. All fixture mounting shall meet seismic requirements of the State of California.

3. Provide support for all fixtures from (or on) building structural wall members. Support from ceiling tiles only is specifically prohibited.

C. Fire Protection:

1. All recessed fixtures shall be protected from contact with combustible building materials, such as wood framing members and insulation vapor barriers, as required by applicable codes.

2. Fixtures installed in rated 1-hour ceilings shall be encased by a 1-hour enclosure to maintain the fire integrity of the ceiling. All fixture enclosures will comply with UL Fire Resistance Directory Design Requirements.

D. Cleaning up: All fixtures shall be left in a clean condition, free of dirt and defects, before acceptance by the Owner.

3.04 GROUNDING AND BONDING

A. The entire electrical raceway system shall form a continuous metallic electrical conductor from service point to every outlet and shall be grounded by connection to the main service ground.

B. A ground wire shall be installed in all PVC and flexible conduit.

C. All raceway systems, supports, cabinets, switchboards, control equipment, motor frames, lighting fixtures and utilization apparatus shall be permanently and effectively grounded.

D. Where cabinets are furnished with grounding bus, all required bonding conductors shall connect thereto, each with separate lug.

E. All grounding conductors are to be copper only. Aluminum will not be allowed.

3.05 TESTS

A. Upon completion of the work and adjustments of all equipment, all systems shall be tested to demonstrate that all equipment furnished, installed and/or connected under the provisions of these specifications shall function in the required manner.

B. All systems shall test free from short circuits and grounds and be free from mechanical and electrical defects. All circuits shall be tested for the proper neutral connection, and rotation of motors.

C. Where tests indicate faulty installation or other defects, they shall be located, repaired, and retested at the Contractor's expense.

END OF SECTION