PROJECT MANUAL

SNAKE RIVER 1, 2, 3 REMODEL
BLACKFOOT IDAHO WEST STAKE

Property/Project Number: 5130220224040101

101 North 900 West
Blackfoot, Idaho 83221

Architect: **JAMES K. LYSTRUP**
2453 Malaga Ave
Santa Clara, UT 84765
Phone: (208) 406-3153

Mechanical Engineer: **ENGINEERED SYSTEMS**
1355 E. Center Street
Pocatello, Idaho 83201

Electrical Engineer: **PAYNE ENGINEERING**
1823 E. Center Street
Pocatello, Idaho 83201

April 2025

BIDDING REQUIREMENTS

FOR SMALL PROJECTS (U.S.)

INVITATION TO BID (U.S.)

1. CONTRACTORS INVITED TO BID THE PROJECT:

KT Construction
Coffin Construction
J&S Construction
Coffin Development
Jones Construction

2. PROJECT:

Snake River 1, 2, 3 Remodel
Blackfoot Idaho West Stake
5130220224040101

3. LOCATION:

101 North 900 West
Blackfoot, Idaho 83221

4. OWNER:

The Church of Jesus Christ of Latter-day Saints, a Utah corporation sole
c/o
(Logan King, Project Manager)

5. CONSULTANT:

James K. Lystrup, Architect
2453 Malaga Ave.
Santa Clara, Utah 84765
208-406-3153

6. DESCRIPTION OF PROJECT:

A.

B. Products or systems may be provided through relationships the Owner has negotiated with suppliers as indicated in the Specifications.

7. TYPE OF BID: Bids will be on a lump-sum basis. Segregated bids will not be accepted.

8. TIME OF SUBSTANTIAL COMPLETION: The time limit for substantial completion of this work will be 60 calendar days and will be as noted in the Agreement.

9. BID OPENING: Bids will be received by Owners preferred method at (time and date at place) to be announced. Bids will be publicly opened at (time and date at place) to be announced.

10. BIDDING DOCUMENTS:

A. Bidding Documents may be examined at the following plan room locations:

1)

2)

B. Bidding Documents may be obtained from the Architect.

C. Bidding Documents may be obtained from Owner's electronic bidding tool.

11. **BIDDER'S QUALIFICATIONS:** Bidding by the Contractors will be by invitation only.

12. **OWNER'S RIGHT TO REJECT BIDS:** Owner reserves the right to reject any or all bids and to waive any irregularity therein.

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INSTRUCTIONS TO BIDDERS (U.S.)

1. DOCUMENTS:

A. Bidding Documents include Bidding Requirements and proposed Contract Documents. Proposed Contract Documents consist of:
   1) Agreement Between Owner and Contractor for Small Project (U.S.)
   2) Other documents included by reference
   3) Addenda.

B. Bidding Requirements are those documents identified as such in proposed Project Manual.

C. Addenda are written or graphic documents issued prior to execution of the Contract which modify or interpret the Bidding Documents. They become part of the Contract Documents as noted in the Agreement Between Owner and Contractor for Small Project (U.S.) upon execution of the Agreement by Owner.

2. BIDDER'S REPRESENTATIONS:

A. By submitting a bid proposal, bidder represents that
   1) Bidder has carefully studied and compared Bidding Documents with each other. Bidder understands the Bidding Documents and the bid is fully in accordance with the requirements of those documents.
   2) Bidder has thoroughly examined the site and any building located thereon, has become familiar with local conditions which might directly or indirectly affect contract work, and has correlated its personal observations with requirements of proposed Contract Documents, and
   3) Bid is based on materials, equipment, and systems required by Bidding Documents without exception.

3. BIDDING DOCUMENTS:

A. Copies
   1) Owner will provide the Bidding Documents as set forth in the Invitation to Bid.
   2) Partial sets of Bidding Documents will not be issued.

B Interpretation or Correction of Bidding Documents
   1) Bidders will request interpretation or correction of any apparent errors, discrepancies, and omissions in the Bidding Documents.
   2) Corrections or changes to Bidding Documents will be made by written Addenda.

C. Substitutions and Equal Products
   1) Generally speaking, substitutions for specified products and systems, as defined in the Uniform Commercial Code, are not acceptable. However, equal products may be

approved upon compliance with Contract Document requirements.

2) Base bid only on materials, equipment, systems, suppliers or performance qualities specified in the Bidding documents.

3) Where a specified product is identified as a "quality standard", products of other manufacturers that meet the performance, properties, and characteristics of the specified "quality standard" may be used without specific approval as a substitute.

D. Addenda - Addenda will be sent to bidders and to locations where Bidding Documents are on file no later than 2 business days prior to bid opening.

4. BIDDING PROCEDURES:

A. Form and Style of Bids

1) Use Owner's online bidding tool.

2) Fill in all blanks on online bidding tool. Signatures will be executed by representative of bidder duly authorized to make contracts.

3) Bids will bear no information other than that requested on bid form. Do not delete from or add to the information requested on the bid form.

B. Submission of Bids

1) Follow the instructions in the Owner's bidding tool when submitting your bid.

2) It is bidder's sole responsibility to see that its bid is received at specified time.

3) No oral, facsimile transmitted, telegraphic, or telephonic bids, modifications, or cancellations will be considered.

C. Modification or Withdrawal of Bid

1) Bidder guarantees there will be no revisions or withdrawal of bid amount for 45 days after bid opening.

2) Prior to bid opening, bidders may withdraw bid from Owner's bidding tool.

5. CONSIDERATION OF BIDS:

A. Opening Of Bids - See Invitation to Bid.

B. Rejection of Bids - Owner reserves right to reject any or all bids and to waive any irregularity therein.

C. Acceptance Of Bid

1) No bidder will consider itself under contract after opening and reading of bids until Agreement between Owner and Contractor is fully executed.

2) Bidder's past performance, organization, subcontractor selection, equipment, and ability to perform and complete its contract in manner and within time specified, together with amount of bid, will be elements considered in award of contract.

6. FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR:

A. Agreement form will be "Small Project Agreement Between Owner and Contractor (U.S.)" and "Supplementary Conditions for Small Project Agreement (U.S.).

7. MISCELLANEOUS:

A. Pre-Bid Conference. A pre-bid conference may be held at a time and place to be announced.

B. Examination Schedule for Existing Building and Site

1) Contact John Tolman, Facilities Manager for access to building, phone number: 801-949-9422

END OF DOCUMENT

INFORMATION AVAILABLE TO BIDDERS (U.S.)

1. GEOTECHNICAL DATA

A. Geotechnical Report -

1) Owner has secured the services of a geotechnical engineer to aid in design of the Project. Following conditions apply -

a) A geotechnical report has been prepared by N/A, referred to as the Geotechnical Engineer.

b) A copy of this report will be issued to each invited Contractor.

c) This report was obtained solely for use in design by Consultant and is not a part of the Contract Documents. It is not intended that Contractor rely on geotechnical engineer's report.

d) Reports are provided for Contractor's information but are not a warranty of subsurface conditions.

2) Prior to bidding, Contractor may make his own subsurface investigations to satisfy himself with site and subsurface conditions.

2. ASBESTOS-CONTAINING MATERIAL (ACM)

A. The building upon which work is being performed has been examined for asbestos-containing material. The following have been identified as containing asbestos in the areas of the building being worked on as part of this Project:

1) N/A

B. Refer to Section , Article for requirements to be followed.

END OF DOCUMENT

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CONSTRUCTION MATERIAL ASBESTOS STATEMENT (U.S.)

PROJECTS FOR:
THE CHURCH OF JESUS CHRIST OF LATTER-DAY SAINTS,
a Utah corporation sole

Building Name: _____

Building Plan Type: _____

Building Address: _____

Building Owner: The Church of Jesus Christ of Latter-day Saints, a Utah corporation sole.

Project Number: _____

Completion Date: _____

As PROJECT CONSULTANT and principal in charge; based on my best knowledge, information, inspection, and belief; I certify that on the above referenced Project, no asbestos-containing building materials were specified in the construction documents or given approval in shop drawings or submittals.

_____ _____
Project Consultant and Principal in Charge (signature) Date

_____
Company Name

As GENERAL CONTRACTOR in charge of construction; based on my best knowledge, information, inspection, and belief; I affirm that on the above-referenced Project, no asbestos-containing building materials were used in the construction.

_____ _____
General Contractor (signature) Date

_____
Company Name

INTRODUCTORY INFORMATION

SMALL PROJECT AGREEMENT
BETWEEN OWNER AND CONTRACTOR
Fixed Sum (U.S.)

The Church of Jesus Christ of Latter-day Saints, a Utah corporation sole ("Owner") and _____ ("Contractor") enter into this *Small Project Agreement Between Owner and Contractor (U.S.)* ("Agreement") and agree as follows:

1. **Property/Project.**

   Property/Project Number: _____
   Property Address ("Project Site"): _____
   Project Type: _____
   Project Name ("Project"): _____
   Stake Name: _____

2. **Scope of Work.** Contractor will furnish all labor, materials, tools, and equipment necessary to complete the Work in accordance with the Contract Documents. The Work is all labor, materials, tools, equipment, construction, and services required by the Contract Documents (the "Work").

3. **Contract Documents.** Contract Documents consist of:
   a. This Agreement;
   b. Supplementary Conditions for Small Project Agreement Between Owner and Contractor (U.S.);
   c. The Specifications (Division 01 and Divisions _____);
   d. Drawings entitled and dated _____;
   e. Addendum No. with date(s) _____;
   g. All written Field Changes, written Construction Change Directives and written Change Orders when prepared and signed by Owner and Contractor.

4. **Compensation.** Owner will pay Contractor for performance of Contractor's obligations under the Contract Documents the sum of _____ Dollars ($_____) (the "Contract Sum"). This Contract Sum includes all labor, materials, equipment, tools, costs, expenses, work and services of Contractor and its subcontractors necessary to perform the Work in accordance with the terms of this Agreement, including without limitation travel, communications, and copying costs.

5. **Payment.**
   a. If the Contract Sum is over $100,000 or if otherwise requested by Owner, Contractor will submit to Owner a schedule of values which allocates the Contractor's Bid Proposal Amount to various portions of the Work. This schedule, when accepted by Owner will be used as a basis for reviewing Contractor's payment requests.
   b. Not more than once each month, Contractor will submit a payment request to Owner. Owner will pay Contractor for work completed within thirty (30) days after Owner receives:
      1) Contractor's payment request for work to date;
      2) a certification by Contractor that Contractor has paid for all labor, materials, and equipment relating to the Work covered by prior payment requests and that Contractor will pay for all labor, materials, and equipment relating to the Work covered by the current payment request; and
      3) releases of all mechanics' liens and claims of subcontractors, laborers, or material suppliers who supplied labor and/or materials for the Work covered by the payment request.
      4) updated Construction Schedule.
   c. Owner may modify or reject the payment request if, in Owner's opinion, the Work for which payment is requested is not acceptable or is less complete than represented on the payment request.
   d. Contractor will timely pay subcontractors their portion of fees and expenses that Owner has paid to Contractor.

6. **Extras and Change Orders.**
   a. Owner may order changes in the Work by altering, adding to, or deducting from the Work. In the event of such a change, the Contract Sum and/or the time of completion will be adjusted to reflect the change by means of a written Change Order signed by Contractor and Owner. Contractor will not commence work on any change until either: (a) Contractor and Owner have executed a Change Order; or (b) Owner has issued a written order for the change acknowledging that there is a dispute regarding the compensation adjustment relating to the change. If Contractor proceeds with a change in the Work without complying with the preceding sentence, Contractor agrees that it will not be entitled to any additional compensation for such change.
   b. For any Change Order, Contractor will timely furnish a proposal for the Change Order containing a price breakdown itemized as required by Owner. The break down will be in sufficient detail to allow Owner to determine any increase or decrease in the Contractor's direct out of pocket cost to perform the Change Order Work. Any amount claimed for Subcontractors will be supported by a similar price breakdown and will itemize the Subcontractor's direct out of pocket costs as well as profit and overhead charges resulting from the Change in the Work. Profit and overhead will be subject to the following limitations:
      1. The Subcontractor's profit and overhead will not exceed eight (8%) percent of Subcontractor's Direct Costs.
      2. Contractor's profit and overhead mark-up on work performed by its own crews will not exceed five (5%) percent of Contractor's direct out of pocket costs for such work.
      3. Contractor's profit and overhead mark up on work performed by Subcontractors will not exceed five percent (5%).
      4. Amounts due Owner as a result of a credit change will be the actual net decrease in the Contractor's direct out of pocket costs to perform the Work as a result of the Change in the Work. Overhead and profit for the Change Order will be calculated based on the net increase or decrease in Contractor's direct out of pocket costs resulting from the Change in the Work.

7. **Warranty and Correction of Work.** For all Work, services, labor, materials, products, and equipment provided under the Contract Documents, Contractor provides and extends to Owner all statutory, common law, and standard industry warranties as well as those warranties set forth in Owner's Contract Documents. Unless a longer period is specified by Owner's Contract Documents or otherwise, Contractor, at a minimum and in addition to all other warranties, warrants all Work under the Contract Documents for at least one year. Specifically, and without limitation, Contractor will promptly correct at its own expense:
   a. any portion of the Work which
      1) fails to conform to the requirements of the Contract Documents, or
      2) is rejected by the Owner as defective or because it is damaged or rendered unsuitable during installation or resulting from failure to exercise proper protection.
   b. any defects due to faulty materials, equipment, or workmanship which appear within a period of one year from the date of completion of the Work or within such longer period of time as may be prescribed by law or the terms of any applicable special warranty required by the Contract Documents.

8. **Time of Completion.** Contractor will complete the Work and have it ready for Owner's inspection within _____ (_____) calendar days from Notice to Proceed issued by Owner. Time is of the essence. If Contractor is delayed at any time in the progress of the Work by any act or neglect of Owner, or by changes in the Work, or by strikes, lockouts, unusual delay in transportation, unavoidable casualties, or acts of nature beyond Contractor's control, then the time for completion will be extended by the time that completion of the Work is delayed. However, Contractor expressly waives any damages for any such delays.

9. **Owner Provided Items.** Owner may provide furnishings, equipment, and/or other items for the Project. Contractor will install items furnished by Owner and/or receive, store, and protect such items on site until the date Owner accepts the Project.

10. **Product Requirements**. Contractor will provide products that comply with Contract Documents, are undamaged, and, unless otherwise indicated, are new and unused at time of installation. Contractor will provide products complete with accessories, trim, finish, safety guards, and other devices and details needed for complete installation and for intended use and effect.

11. **Permits, Surveys, and Taxes.** Contractor will obtain and pay for all permits and licenses, and also pay any applicable taxes. Contractor will also obtain and pay for any surveys it needs to perform the Work.

12. **Independent Contractor Relationship.** Contractor is not an agent or employee of Owner but is an independent contractor.

13. **Comply with Laws.** Contractor will comply, and ensure that all subcontractors comply, with all applicable laws, ordinances, rules, regulations, covenants, and restrictions.

14. **Indemnity and Hold Harmless.**
    a. Contractor will indemnify and hold harmless Owner and Owner's representatives, employees, agents, architects, and consultants from and against any and all claims, liens, damages, liability, demands, costs, judgments, awards, settlements, causes of action, losses and expenses (collectively "Claims" or "Claim"), including but not limited to attorney fees, consultant fees, expert fees, copy costs, and other expenses, arising out of or resulting from performance of or failure to perform the Work, attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of real or personal property, including loss of use resulting therefrom, except to the extent that such liability arises out of the negligence of Owner, its representatives, agents, and employees. This indemnity includes, without limitation, indemnification of Owner from all losses or injury to Owner's property, except to the extent that such loss or injury arises out of the negligence of Owner, its representatives, agents, and employees. This indemnity applies, without limitation, to include Claims occurring both during performance of the Work and/or subsequent to completion of the Work. In the event that any Claim is caused in part by a party indemnified hereunder, that party will bear the cost of such Claim to the extent it was the cause thereof. In the event that a claimant asserts a Claim for recovery against any party indemnified hereunder, the party indemnified hereunder may tender the defense of such Claim to Contractor. If Contractor rejects such tender of defense and it is later determined that the negligence of the party indemnified hereunder did not cause all of the Claim, Contractor will reimburse the party indemnified hereunder for all costs and expenses incurred by that party in defending against the Claim. Contractor will not be liable hereunder to indemnify any party for damages resulting from the sole negligence of that party.
    b. In addition to the foregoing, Contractor will be liable to defend Owner in any lawsuit filed by any Subcontractor relating to the Project. Where liens have been filed against Owner's property, Contractor (and/or its bonding company which has issued bonds for the Project) will obtain lien releases and record them in the appropriate county and/or local jurisdiction and provide Owner with a title free and clear from any liens of Subcontractors. In the event that Contractor and/or its bonding company are unable to obtain a lien release, Owner in its absolute discretion may require Contractor to provide a bond around the lien or a bond to discharge the lien, at Contractor's sole expense.
    c. In addition to the foregoing, Contractor will indemnify and hold Owner harmless from any claim of any other contractor resulting from the performance, nonperformance or delay in performance of the Work by Contractor.
    d. The indemnification obligation herein will not be limited by a limitation on the amount or type of damages, compensation or benefits payable by or for Contractor or a Subcontractor under workers compensation acts, disability benefit acts, or other employee benefit acts.

15. **Work Restrictions.** Contractor will ensure that Contractor, its agents, employees, and subcontractors:
    a. Do not use or consume alcohol or cannabis, or illegally use drugs, on the Project Site or enter on or perform any Work on the Project Site while under their influence.
    b. Do not smoke or vape anything on the Project Site. Do not use tobacco in any form on the Project Site.
    c. Do not perform Work on the Project Site on Sundays except for emergency work.
    d. Refrain from using profanity or being discourteous or uncivil to others on the Project Site or while performing Work under this Agreement.
    e. Do not view or allow pornographic or other indecent materials on the Project Site.
    f. Do not play obnoxious and/or loud music on the Project Site. Do not play any music within existing facilities.
    g. Refrain from wearing immodest, offensive, or obnoxious clothing, while on the Project Site.
    h. Do not bring weapons on the Project Site.

16. **Safety Hazards.** Contractor will ensure that no work or services will be performed that may pose an undue safety hazard to Contractor, Contractor's employees, or any other person.

17. **Contractor's Insurance.** Prior to performing any work, Contractor will obtain and maintain during the term of this Agreement the following insurance:
    a. Workers Compensation Insurance or evidence of exemption.
    b. Employers Liability Insurance with minimum limits of the greater of $500,000 E.L. each accident, $500,000 E. L. disease-each employee, $500,000 E.L. disease-policy limit or as required by the law of the state in which the Project is located.
    c. Commercial General Liability Insurance – ISO Form CG 00 01 (12/07) or equivalent Occurrence policy which will provide primary coverage to the additional insureds (the Owner and the Architect) in the event of any Occurrence, Claim, or Suit with:
        1) Limits of the greater of: Contractor's actual coverage amounts or the following:
            a) $2,000,000 General Aggregate;
            b) $2,000,000 Products - Comp/Ops Aggregate;
            c) $1,000,000 Personal and Advertising Liability;
            d) $1,000,000 Each Occurrence; and
            e) $50,000 Fire Damage to Rented Premises (Each Occurrence)
        2) Endorsements attached to the General Liability policy including the following or their equivalent:
            a) ISO Form CG-25-03 (05/09), Amendment of Limits of Insurance (Designated Project or Premises) describing the Agreement and specifying limits as shown above.
            b) ISO Form CG 20 10 (07/04), Additional Insured – Owners, Lessees, Or Contractors (Form B), naming Owner and Architect as additional insureds.
    d. Automobile Liability Insurance, with:
        1) Combined Single Limit each accident in the amount of no less than $500,000; and
        2) Coverage applying to "Any Auto" or its equivalent.

    Contractor will provide evidence of these insurance coverages to Owner by providing an ACORD 25 (2010/05) Form or its equivalent: (1) listing Owner as the Certificate Holder and Additional Insured on the general liability and any excess liability policies, (2) listing the insurance companies providing coverage (all companies listed must be rated in A.M. Best Company Key Rating Guide-Property-Casualty and each company must have a rating of B+ Class VII or higher), (3) attaching the endorsements set forth above for the Certificate of Liability Insurance, and (4) bearing the name, address and telephone number of the producer and signed by an authorized representative of the producer. (The signature may be original, stamped, or electronic.) Notwithstanding the foregoing, Owner may, in writing and at its sole discretion, modify these insurance requirements.

18. **Resolution of Disputes.** In the event there is any dispute arising under the Contract Documents which cannot be resolved by agreement between the parties, either party may submit the dispute with all documentation upon which it relies to Director of Architecture, Engineering, and Construction, 50 East North Temple, Salt Lake City, Utah 84150, who will convene a dispute resolution conference within thirty (30) days. The dispute resolution conference will constitute settlement negotiations and any settlement proposal made pursuant to the conference will not be admissible as evidence of liability. In the event that the parties do not resolve their dispute pursuant to the dispute resolution conference, either party may commence legal action to resolve the dispute. Any such action must be commenced within six (6) months from the first day of the dispute resolution conference or be time barred. Submission of the dispute to the Director as outlined above is a condition precedent to the right to commence legal action to resolve any dispute. In the event that either party commences legal action to adjudicate any dispute without first submitting the dispute to the Director, the other party will be entitled to obtain an order dismissing the litigation without prejudice and awarding such other party any costs and attorney fees incurred by that party in obtaining the dismissal, including without limitation copy costs, and expert and consultant fees and expenses. Pending final resolution of a dispute hereunder, Contractor will proceed diligently with the performance of its obligations pursuant to this Agreement.

19. **Termination by Contractor.** In the event Owner materially breaches any term of the Contract Documents, Contractor will promptly give Written Notice of the breach to Owner. If Owner fails to cure the breach within

ten (10) days of the Written Notice, Contractor may terminate this Agreement by giving Written Notice to Owner and recover from Owner the percentage of the Contract Sum represented by the Work completed on the Project site as of the date of termination together with any out of pocket loss Contractor has sustained with respect to materials and equipment as a result of the termination prior to completion of the Work, less any offsets. Contractor will not be entitled to unearned profits or any other compensation or damages as a result of the termination and hereby waives any claim therefor. Contractor will provide to Owner all warranty, as built, inspection, and other close out documents as well as materials that Contractor has in its possession or control at the time of termination. Without limitation, Contractor's indemnities and obligations as well as all warranties relative to Work provided through the date of termination survive a termination hereunder.

20. **Termination by Owner for Cause.** Should Contractor fail to timely provide Owner with the certificates of insurance, make a general assignment for the benefit of its creditors, fail to apply enough properly skilled workmen or specified materials to properly prosecute the Work in accordance with Contractor's schedule, or otherwise materially breach any provision of the Contract Documents, then Owner may, without any prejudice to any other right or remedy, give Contractor Written Notice thereof. If Contractor fails to cure its default within ten (10) days, Owner may terminate this Agreement by giving Written Notice to Contractor. In such case, Owner may, in Owner's sole discretion, take legal assignment of subcontracts and other contractual rights of Contractor and/or take possession of the premises and all materials, tools, equipment, and appliances thereon, and finish the Work by whatever method Owner deems expedient. Contractor will not be entitled to receive any further payment until the Work is finished. If the unpaid balance of the Contract Sum exceeds the expense of finishing the Work, including compensation for additional administrative, architectural, consultant, and legal services (including without limitation attorney fees, expert fees, copy costs, and other expenses), such excess will be paid to Contractor, less any offsets. If such expense exceeds the unpaid balance, Contractor will pay the difference to Owner. Contractor will provide to Owner all warranty, as built, inspection, and other close out documents as well as materials that Contractor has in its possession or control at the time of termination. Without limitation, Contractor's indemnities and obligations as well as all warranties relative to Work provided through the date of termination survive a termination hereunder.

21. **Termination by Owner for Convenience.** Notwithstanding any other provision contained in the Contract Documents, Owner may, without cause and in its absolute discretion, terminate this Agreement at any time. In the event of such termination, Contractor will be entitled to recover from Owner the percentage of the Contract Sum equal to the percentage of the Work which Owner and/or its architect determines has been completed on the Project site as of the date of termination together with any out of pocket loss Contractor has sustained with respect to materials and equipment as a result of the termination prior to completion of the Work, less any offsets. Contractor will not be entitled to unearned profits or any other compensation as a result of the termination and hereby waives any claim therefor. Contractor will provide to Owner all warranty, as built, inspection, and other close out documents as well as materials that Contractor has in its possession or control at the time of termination. Owner may, in Owner's sole discretion, take legal assignment of subcontracts and other contractual rights of Contractor. Without limitation, Contractor's indemnities and obligations as well as all warranties relative to Work provided through the date of termination survive a termination hereunder.

22. **Enforcement.** In the event either party commences legal action to enforce or rescind any term of this Agreement, the prevailing party will be entitled to recover its attorney fees, costs and legal expenses, including without limitation all copy costs and expert and consultant fees and expenses, incurred in that action and on all appeals, from the other party.

23. **Ownership of Materials, Products, and Intellectual Property Rights.** Owner will retain ownership and intellectual property rights in all plans, designs, drawings, documents, concepts, and materials provided by or on behalf of Owner to Contractor and to all work products of Contractor and its subcontractors for products, services, and Work provided under this Agreement, such products, services, and Work of Contractor and its subcontractors constituting works made for hire. Neither Contractor nor its subcontractors will reuse any portion of such items provided by Owner or work products developed by Contractor or its subcontractors for Owner pursuant to this Agreement or disclose any such items to any third party without the prior written consent of Owner. Owner may withhold its consent in its absolute discretion. Contractor shall obtain the written agreement of each of its subcontractors to the terms of this section prior to permitting the subcontractor to perform any

services contemplated by this Agreement.

24. **Comply with Intellectual Property Rights of Others.** Contractor represents and warrants that no Work or services (with its means, methods, goods, and services attendant thereto), provided to Owner will infringe or violate any right of any third party and that Owner may use and exploit such Work, means, methods, goods, and services without liability or obligation to any person or entity (specifically and without limitation, such Work, means, methods, goods, and services will not violate rights under any patent, copyright, trademark, or other intellectual property right or application for the same).

25. **Ownership and Use of Renderings and Photographs.** Renderings, photographs, and/or other images of or representing the services, Work, or any improvement on or relative to the Project Site, whether created before, during, or at completion of construction (and whether created by Owner, Contractor, or Contractor's subcontractors), are the property of the Owner. Contractor hereby transfers and assigns to Owner all ownership and intellectual property rights that Contractor and/or its subcontractors may have in and to all such renderings, photographs, and other images. The Owner reserves all rights including copyrights and other intellectual property rights to such renderings, photographs, and other images. No such renderings, photographs, or other images shall be used or distributed without written consent of the Owner.

26. **Public Statements.** Contractor will not make any statements or provide any information to the media about the Project or Work without the prior written consent of Owner. If Contractor receives any requests for information from media, Contractor will refer such requests to Owner.

27. **Confidentiality.** Contractor shall ensure that Contractor and its subcontractors, and the employees, agents and representatives of Contractor and its subcontractors, maintain in strict confidence, and shall use and disclose only as authorized by Owner all Confidential Information of Owner that Contractor receives in connection with the performance of this Agreement. Notwithstanding the foregoing, Contractor may use and disclose any information to the extent required by an order of any court or governmental authority, but only after it has notified Owner and Owner has had an opportunity to obtain reasonable protection for such information in connection with such disclosure. For purposes of this Agreement, "Confidential Information" means:
    a. The name or address of any affiliate, customer or contractor of Owner or any information concerning the transactions of any such person with Owner;
    b. Any contracts, agreements, business plans, budgets or other financial information, renderings, photographs, and materials provided by Owner, relating to the Work or any improvement on the Project Site to the extent such has not been made available to the public by the Owner;
    c. Any other information that is marked or noted as confidential at the time of its disclosure.

28. **No Commercial Use of Transaction or Relationship.** Without the prior written consent of Owner, which Owner may grant or withhold in its sole discretion, neither Contractor nor Contractor's affiliates, officers, directors, agents, representatives, shareholders, members, Subcontractors, or employees shall make any private commercial use of their relationship to Owner or the Project, including, without limitation:
    a. By referring to the Owner or Project verbally or in any sales, marketing or other literature, letters, client lists, press releases, brochures or other written materials except as may be necessary for Contractor to perform Contractor's obligations under the terms of this Agreement;
    b. By using or allowing the use of any photographs of the Work or Project or any part thereof, or of any service marks, trademarks or trade names or other intellectual property now or which may hereafter be associated with, owned by or licensed by Owner, in connection with any work, service or product; or
    c. By contracting with or receiving money or anything of value from any person or commercial entity to facilitate such person or entity obtaining any type of commercial identification, advertising or visibility in connection with the Owner or Project.

    Notwithstanding the foregoing, Contractor may include a reference to Owner or the Project in a professional résumé or other similar listing of Contractor's references without seeking Owner's written consent in each instance, provided that such reference to Owner or the Project is included with at least several other similar references to projects of different owners and is given no more prominence than such other references.

29. **Entire Agreement.** This Agreement contains the entire and integrated agreement between the parties hereto and supersedes all prior negotiations, representations, or agreements, either written or oral, relating to the

Project. This Agreement may be amended only by a writing signed by both parties. This Agreement will not be construed to create a contractual relationship of any kind between any persons or entities other than Owner and Contractor.

30. **Assignment.** Contractor will not assign any right or obligation hereunder without the prior written consent of the Owner, which consent may be granted or withheld in Owner's absolute discretion.

31. **Governing Law.** The parties acknowledge that the Contract Documents have substantial connections to the State of Utah. The Contract Documents will be deemed to have been made, executed, and delivered in Salt Lake City, Utah. To the maximum extent permitted by law, (i) the Contract Documents and all matters related to their creation and performance will be governed by and enforced in accordance with the laws of the State of Utah, excluding conflicts of law rules, and (ii) all disputes arising from or related to the Contract Documents will be decided only in a state or federal court located in Salt Lake City, Utah and not in any other court or state. Toward that end, the parties hereby consent to the jurisdiction of the state and federal courts located in Salt Lake City, Utah and waive any other *venue* to which they might be entitled by virtue of domicile, habitual residence, place of business, or otherwise.

32. **Effective Date.** The effective date of this Agreement is the date indicated by Owner's signature.

OWNER:	**CONTRACTOR:**
The Church of Jesus Christ of Latter-day Saints, a Utah corporation sole	
Signature:	Signature:
Print Name:	Print Name:
Title:	Title:
Address:	Address:
Telephone No:	Telephone No:
Facsimile No:	Facsimile No:
Email:	Email:
Effective Date:	Fed. I.D. or SSN:
	License No:
Reviewed By:	Date Signed:

SUPPLEMENTARY CONDITIONS

FOR SMALL PROJECT AGREEMENT BETWEEN OWNER AND CONTRACTOR (U.S.)

ITEM 1 - GENERAL

1. Conditions of the Small Project Agreement Between Owner and Contractor (U.S.) apply to each Division of the Specifications.

2. Provisions contained in Division 01 apply to all Divisions of the Specifications.

ITEM 2 - LIQUIDATED DAMAGES PAYABLE TO OWNER

This section may be included as a separate additional paragraph to the Small Project Agreement Between Owner and Contractor (U.S.), at Owner's discretion:

Delay in Completion of the Work. For each day after the expiration of the designated Time of Completion that Contractor has not completed the Work, Contractor will pay Owner the amount of $150.00 dollars ($50.00) per day as liquidated damages for Owner's loss of use and the added administrative expense to Owner to administer the Project during the period of delay. In addition, Contractor will reimburse Owner for any additional Architect's fees, attorneys' fees, expert fees, consultant fees, copy costs, and other expenses incurred by Owner as a result of the delay. Owner may deduct any liquidated damages or reimbursable expenses from any money due or to become due to Contractor. If the amount of liquidated damages and reimbursable expenses exceeds any amounts due to Contractor, Contractor will pay the difference to Owner within ten (10) days after receipt of a written request from Owner for payment.

ITEM 3 - STATE SPECIFIC SUPPLEMENTARY CONDITIONS

Alabama

N/A

Alaska

N/A

Arizona

Replace section 5.b. of the Agreement with the following:

b. Not more than once each month, Contractor will submit a payment request to Owner. Owner will pay Contractor for Work completed within seven (7) days after:
   1. Contractor submits to Owner Contractor's payment request for Work to date;
   2. Contractor provides to Owner a certification by Contractor that Contractor has paid for all labor, materials, and equipment relating to the Work covered by prior payment requests and that Contractor will pay for all labor, materials, and equipment relating to the Work covered by the current payment request;
   3. Contractor has obtained releases of all mechanics' liens and claims of subcontractors, laborers, or material suppliers who supplied labor and/or materials for the Work covered by the payment request; and
   4. Owner has certified and approved all or part of the payment request and notified Contractor in writing (which Owner must do within 14 days of Contractor's submission of the payment request to Owner).

   Owner may modify or reject the payment request if, in Owner's opinion, the Work for which payment is requested is not acceptable or is less complete than represented on the payment request.

Arkansas

N/A

California

N/A

Colorado

COLORADO STATE SALES TAX:

Add the following to the Small Project Agreement Between Owner and Contractor (U.S.):

1. Contractor will make an application to State Department of Revenue for certificate of exemption to permit purchase of building materials for construction of this Project without payment of Sales Tax. Applications and certificates will be on forms provided by the Department of Revenue.

2. Prior to start of construction, Contractor will furnish to the Owner copies of the applications submitted and certificates obtained. Upon receipt of the certificate Contractor shall make a copy for each subcontractor involved in the Project and complete it by filling in the subcontractor's name and address and signing it. The original certificate and copies of all certificates that the Contractor issues to subcontractors should be kept at the Contractor's place of business for a minimum of three years.

3. The Owner's sales tax exemption number for the State of Colorado is 98-01587.

Connecticut

CONNECTICUT STATE SALES TAX:

Add the following to the Small Project Agreement Between Owner and Contractor (U.S.):

1. Sales of materials and supplies that will be physically and permanently incorporated into the construction project should be exempt from Connecticut state sales tax. The Owner's sales tax exemption number for the State of Connecticut is E-9613.

Delaware

N/A

District of Columbia

WASHINGTON D.C. SALES TAX:

Add the following to the Small Project Agreement Between Owner and Contractor (U.S.):

1. Materials that will be physically incorporated into and made a part of the Owner's real property may be purchased by the Contractor free of Washington D.C. sales tax.

2. The Owner's tax exempt number is 8661-0185848-001.

3. Contractor is responsible for submitting the Tax Exempt Purchase Certificate Form for real property projects on behalf of the Owner.

Florida

NOTICE OF COMMENCEMENT

Add the following to the Small Project Agreement Between Owner and Contractor (U.S.):

Before commencing the Project, Contractor shall record a notice of commencement in the clerk's

office and post a certified copy thereof. The notice of commencement shall substantially comply with the form in Florida Statutes 713.13 and contain the following information:

1. A description sufficient for identification of the real property to be improved. The description should include the legal description of the property and also should include the street address and tax folio number of the property if available or, if there is no street address available, such additional information as will describe the physical location of the real property to be improved.
2. A general description of the improvement.
3. The name and address of the owner, the owner's interest in the site of the improvement, and the name and address of the fee simple titleholder, if other than such owner. A lessee who contracts for the improvements is an owner as defined under Florida Statutes s. 713.01(23) and must be listed as the owner together with a statement that the ownership interest is a leasehold interest.
4. The name and address of the contractor.
5. The name and address of the surety on the payment bond under Florida Statutes s. 713.23, if any, and the amount of such bond.
6. The name and address of any person making a loan for the construction of the improvements.
7. The name and address within the state of a person other than himself or herself who may be designated by the owner as the person upon whom notices or other documents may be served under this part; and service upon the person so designated constitutes service upon the owner.

Georgia
N/A

Hawaii
N/A

Idaho
N/A

Illinois

ILLINOIS STATE CONTRACTOR TO PROVIDE NOTICE OF SUBCONTRACTORS:

Add the following to the Small Project Agreement Between Owner and Contractor (U.S.):

Contractor shall provide to Owner a statement of names and addresses of all those furnishing for this Project labor, services, material, fixtures, apparatus or machinery, and form or forms work, as well as the amounts due or to become due to such persons / entities. Such notice shall be in writing and under oath or verified by affidavit. Notwithstanding any provision to the contrary, Owner is not required to make payments to Contractor until Contractor provides Owner sufficient evidence of Contractor's compliance with this notice requirement.

ILLINOIS STATE SALES TAX:

Add the following to the Small Project Agreement Between Owner and Contractor (U.S.):

1. Sales of materials to construction contractors for incorporation into the Owner's real estate may be exempt from Illinois state sales tax. (Sales of tools, fuel, lumber for forms, and other end use or consumption items to contractors who do not incorporate these items into real estate are subject to Illinois state sales tax.)

2. Contractor will obtain and provide subcontractors and suppliers with a certificate that
   - States the construction contractor's purchases are for conversion into real estate under a contract with the Owner;
   - Identifies the Owner by name and address; and

- States on what date the contract was entered into.

The Contractor will also provide subcontractors and suppliers with the sales tax exemption number for Owner. The Owner's sales tax exemption number for the State of Illinois is E9986-4045-06.

Indiana

INDIANA STATE SALES TAX:

Add the following to the Small Project Agreement Between Owner and Contractor (U.S.):

1. Purchase of materials and supplies might be exempt from Indiana state sales tax. In the event that the Project qualifies for a sales and use tax exemption, the Owner's sales tax exemption number for the State of Indiana is 7343965.

Iowa

N/A

Kansas

KANSAS STATE SALES TAX:

Add the following to the Small Project Agreement Between Owner and Contractor (U.S.):

1. Upon obtaining a certificate of tax exemption for the project, an exemption from Kansas state sales tax should be allowed for tangible personal property and services purchased by Contractor for the project. Purchases of construction machinery, equipment or tools for the project are not exempt but rather are subject to state sales tax.

2. Prior to beginning work on the project, Contractor will assist the Owner in making a timely application to the State for a certificate of tax exemption for the project. After the certificate of tax exemption is obtained from the State, Contractor will furnish the number of the certificate to all suppliers from whom it makes purchases; and all such suppliers shall execute invoices covering the items purchased bearing the number of such certificate. In addition, upon completion of the project, Contractor will timely furnish to Owner a sworn statement (on the form provided by the Kansas Director of Taxation) that all purchases made under such exemption certificate were entitled to the tax exemption. All invoices for such tax exempt purchases shall be held by Contactor for a period of five years.

Kentucky

N/A

Louisiana

N/A

Maine

MAINE STATE SALES TAX:

Add the following to the Small Project Agreement Between Owner and Contractor (U.S.):

1. The General Contractor should be exempt from Maine state sales tax on its purchases for this project.

2. The Owner's tax exempt number is 20460.

Maryland

MARYLAND STATE SALES TAX:

Add the following to the Small Project Agreement Between Owner and Contractor (U.S.):

1. The General Contractor should be exempt from Maryland state sales tax on its purchases for this project.

2. The Owner's tax exempt number is 29020063.

Massachusetts

MASSACHUSETTS STATE SALES TAX:

Add the following to the Small Project Agreement Between Owner and Contractor (U.S.):

1. The General Contractor and its subcontractors should be exempt from Massachusetts state sales tax on purchases for this project. Contractors will obtain and complete state form ST-5C and submit it to Owner for signature and return. Contractor will then use the completed Purchase Certificate in making purchases for this Project.

2. The Owner's tax exempt number is E870-234-341.

Michigan

NOTICE OF COMMENCEMENT

Add the following to the Small Project Agreement Between Owner and Contractor (U.S.):

Before commencing the Project, Contractor shall record a Notice of Commencement in the office of the register of deeds for each county in which the real property to be improved is located and post a copy thereof in a conspicuous place on the property. The notice of commencement shall substantially comply with the form in Michigan Compiled Laws 570.1108 and contain the following information:

1. The legal description of the real property on which the improvement is to be made conforming with Michigan Compiled Laws sections 560.212 and 560.255.
2. The name, address, and capacity of the signor for the Owner.
3. The name and address of Owner's designee signing on behalf of Owner.
4. The name and address of the general contractor, if any.
5. The following statement:

   To lien claimants and subsequent purchasers:

   Take notice that work is about to commence on an improvement to the real property described in this instrument. A person having a construction lien may preserve the lien by providing a notice of furnishing to the above-named designee and the general contractor, if any, and by timely recording a claim of lien, in accordance with law.

   A person having a construction lien arising by virtue of work performed on this improvement should refer to the name of the Owner or lessee and the legal description appearing in this Notice. A person subsequently acquiring an interest in the land described is not required to be named in a claim of lien.

   A copy of this Notice with an attached form for notice of furnishing may be obtained upon making a written request by certified mail to the above-named Owner or lessee; the designee; or the person with whom you have contracted.
6. The name and address of the person preparing the Notice.
7. An affidavit of the Owner or the agent of the Owner which verifies the Notice.

Contractor must provide to Owner a copy of the Notice as well as prepare and provide to Owner the Affidavit verifying the Notice for Owner's signature no later than seven (7) days prior to the time Contractor needs to receive the Affidavit back from Owner in order for Contractor to timely finalize and record the Notice of Commencement with its attachments.

In addition to recording and posting the Notice of Commencement, Contractor shall provide the Notice of Commencement and a blank notice of furnishing (described in Michigan Compiled Laws 570.1108), from

time to time, to the property Owner as well as all subcontractors, laborers, or suppliers who request the Notice of Commencement.

CONTRACTOR TO PROVIDE SWORN STATEMENTS

Notwithstanding all other terms and conditions of the Contract Documents, Owner has the right (but no obligation) to require Contractor to submit to Owner a sworn statement that complies with Michigan Compiled Laws 570.1110 prior to the time payment is due or otherwise from time to time.

Minnesota

N/A

Mississippi

N/A

Missouri

MISSOURI STATE SALES TAX:

Add the following to the Small Project Agreement Between Owner and Contractor (U.S.):

1. The Church of Jesus Christ of Latter-day Saints is a Religious Organization exempt from sales tax in accordance with Section 144.062 RSMO as modified by the 1994 Missouri General Assembly.

2. The Owner will furnish a 'Missouri Project Exemption Certificate' and a MO Tax Exemption Letter' to the Contractor.

3. The Owner's tax exempt number is 12473863.

Montana

N/A

Nebraska

NEBRASKA STATE SALES TAX:

Add the following to the Small Project Agreement Between Owner and Contractor (U.S.):

1. Pursuant to applicable laws, Contractor will make application to The Nebraska Department of Revenue to act as prime contractor for approval to use Owner's tax exempt number to permit the purchase of building materials for construction of this Project without payment of sales and use tax. Contractor may delegate its authority to its subcontractors as allowed by law to act as the purchasing agent for tax exemption purposes. Subcontractors shall follow the same application and compliance requirements as the Contractor. Applications will be on forms provided by The Nebraska Department of Revenue.

2. Prior to start of construction, Contractor will furnish copies of the submitted application forms to Owner.

Nevada

NEVADA NOTICE OF COMPLETION:

Add the following to the Small Project Agreement Between Owner and Contractor (U.S.):

A. Within five (5) calendar days of final completion of the Project and in compliance with Section 108.228 Nevada Revised Statutes, Contractor shall, on behalf of the Owner, file with the office of the county recorder of the county where the property is located, and copy to Owner, a notice of completion which shall include, without limitation, the following:

1. The date of completion of the work of improvement;
2. The owner's name, the address of the owner, and the nature of the title of any person signing the notice;
3. A description of the property sufficient for identification;
4. The name of the prime contractor or contractors, if any.

Contractor shall verify the notice of completion on the Owner's behalf.

B. Upon recording the notice, Contractor shall within ten (10) days deliver a copy of the notice by certified mail to each prime contractor and each potential lien claimant who, before the notice was recorded, either submitted a request to the owner to receive the notice or delivered a preliminary notice of right to lien.

C. Notwithstanding any other provision of the Contract Documents to the contrary, Contractor and Owner agree that any breach or failure to comply with this Section by the Contractor will constitute a breach of contract and the Contractor will be liable for any direct, indirect, or consequential damages to the Owner flowing from this breach.

N/A

New Hampshire

N/A

New Jersey

NEW JERSEY STATE SALES TAX:

Add the following to the Small Project Agreement Between Owner and Contractor (U.S.):

1. The General Contractor should be exempt from New Jersey state sales tax on its purchases for this project.

2. The Owner's tax exempt number is EO-237-300-405.

New Mexico

NEW MEXICO STATE PROGRESS PAYMENT AND FINAL PAYMENT:

Replace section 5. of the Small Project Agreement Between Owner and Contractor (U.S.) with the following:

5. Payment.

a. If the Contractor's Bid Proposal Amount is over $100,000, Contractor will submit to Owner a schedule of values which allocates the Contractor's Bid Proposal Amount to various portions of the Work. This schedule. when accepted by Owner will be used as a basis for reviewing Contractor's payment requests.

b. Not more than once each month, Contractor will submit a payment request to Owner. Owner will pay Contractor for work completed within twenty-one (21) days after the following:
   (1) Owner receives Contractor's undisputed payment request for work to date;
   (2) Owner receives a certification by Contractor that Contractor has paid for all labor, materials, and equipment relating to the Work covered by prior payment requests and that Contractor will pay for all labor, materials, and equipment relating to the Work covered by the current payment request; and
   (3) Contractor has obtained releases of all mechanics' liens and claims of subcontractors, laborers, or material suppliers who supplied labor and/or materials for the Work covered by the payment request.

c. Owner may modify or reject the payment request if, in Owner's opinion, the Work for which payment is requested is not acceptable or is less complete than represented on the payment request.

d. Owner will make full and final payment within twenty-one (21) days of the completion of all of the following requirements:
   1. Contractor has submitted to Owner Contractor's final payment request;
   2. Architect, if any, has declared to Owner in writing that the Work is complete; and
   3. Contractor has obtained waiver and release upon final payment documents executed by all of the subcontractors performing work and/or providing materials covered by the Contractor's final payment request; and
   4. Contractor has provided to Owner all manufacturers' and other warranties and guaranties, properly signed and endorsed to Owner. (Delivery of such guaranties and warranties will not relieve Contractor of any obligation assumed under any other provision of the Contract Documents.)

NEW MEXICO STATE PAYMENT OF SUBCONTRACTORS AND MATERIALMEN:

Add the following section to the Small Project Agreement Between Owner and Contractor (U.S.):

11. **Payment of Subcontractors and Materialmen.** Contractor will promptly pay for all labor, materials, and equipment used to perform the Work. Contractor agrees to make prompt payment to its subcontractors within seven (7) days of Contractor's receipt of payment from Owner for that portion of the funds received which represents the subcontractor's portion of the Work completed to Contractor's satisfaction for which payment was made by Owner. Failure of Contractor to make payment within that seven (7) day period will subject Contractor to pay interest to its subcontractors on the undisputed amount at one and one-half percent per month or fraction of a month until payment is issued. Contractor agrees to require of its subcontractors that they make prompt payment to their subcontractors within seven (7) days of their receipt of payment from the Contractor for that portion of the funds received which represents their subcontractor's portion of the Work completed and to be subject to interest at one and one-half percent per month on undisputed amounts not paid to their subcontractors within that seven (7) day period.

New York

NEW YORK STATE SALES TAX:

Add the following to the Small Project Agreement Between Owner and Contractor (U.S.):

1. Exemption from tax is allowed for materials sold to the Contractor for this project. For equipment rentals as well as any materials not used in the building, the Contractor is subject to New York sales tax.

2. The Owner's tax exempt number is 105318.

North Carolina

NORTH CAROLINA STATE SALES TAX:

Add the following to the Small Project Agreement Between Owner and Contractor (U.S.):

1. At end of each calendar quarter, Contractor will provide Owner with the following information from invoices for materials and sub-contract work where North Carolina sales tax has been paid:
   a. Date of invoice
   b. Amount of tax
   c. Name and address of person or company.

LIEN AGENT

Add the following to the Small Project Agreement Between Owner and Contractor (U.S.):

Where the Contract Sum exceeds Thirty Thousand Dollars ($30,000), Contractor on behalf of Owner shall, simultaneous with the execution of the Agreement and at Contractor's sole expense, obtain and

maintain throughout the duration of the Project a lien agent for the Project in satisfaction of North Carolina statutes G.S. § 44A-11.1 & § 44A-11.2. In addition, Contractor shall satisfy all notice requirements under applicable law regarding the lien agent, including, without limitation, providing written information of the lien agent in the building permit and/or on a sign posted and maintained on the Project Site.

North Dakota

N/A

Ohio

OHIO STATE SALES TAX:

Add the following to the Small Project Agreement Between Owner and Contractor (U.S.):

1. Contractor's purchases of materials to be used for this project should be exempt from Ohio state sales tax. Contractor will issue exemption certificates to suppliers.

OHIO STATE NOTICE OF COMMENCEMENT:

Add the following to the Small Project Agreement Between Owner and Contractor (U.S.):

1. In accordance with State of Ohio lien laws, Owner may file Notice of Commencement with the County Recorder of the county in which the Project is located and provide a copy of that notice to Contractor. Contractor will be responsible for distributing notice to subcontractors and suppliers.

Oklahoma

OKLAHOMA STATE SALES TAX

Add the following to the Small Project Agreement Between Owner and Contractor (U.S.):

1. The General Contractor and its subcontractors should be exempt from Oklahoma state sales tax on purchases for this project.
2. The Owner will provide a copy of its exemption documentation.
3. In compliance with Oklahoma Rule 710:65-7-13, Contractor will, on the face of each invoice or sales receipt, set out the name of the Owner, that the purchases are being made on behalf of the Owner, and that the purchases are necessary for the completion of the Agreement.

Oregon

N/A

Pennsylvania

PENNSYLVANIA STATE SALES TAX:

Add the following to the Small Project Agreement Between Owner and Contractor (U.S.):

1. Sales of certain materials to construction contractors for incorporation into the Owner's real estate may be exempt from Pennsylvania state sales tax. Pennsylvania law 72 P.S. § 7201 allows construction contractors to claim the Owner's sales tax exemption for "Building Machinery and Equipment" that is transferred pursuant to the construction contract to the Owner. "Building Machinery and Equipment" is "[g]eneration equipment, storage equipment, conditioning equipment, distribution equipment and termination equipment" limited to the following:
   i. air conditioning limited to heating, cooling, purification, humidification, dehumidification and ventilation;
   ii. electrical;

iii. plumbing;
iv. communications limited to voice, video, data, sound, master clock and noise abatement;
v. alarms limited to fire, security and detection;
vi. control system limited to energy management, traffic and parking lot and building access;
vii. medical system limited to diagnosis and treatment equipment, medical gas, nurse call and doctor paging;
viii. laboratory system;
ix. cathodic protection system; or
x. furniture, cabinetry and kitchen equipment.

The definition also explicitly includes: boilers, chillers, air cleaners, humidifiers, fans, switchgear, pumps, telephones, speakers, horns, motion detectors, dampers, actuators, grills, registers, traffic signals, sensors, card access devices, guardrails, medial devices, floor troughs and grates and laundry equipment, together with integral coverings and enclosures, whether or not the item constitutes a fixture or is otherwise affixed to the real estate whether or not damage would be done to the item or its surroundings upon removal or whether or not the item is physically located within a real estate structure.

However, the term "building machinery and equipment" shall not include guardrail posts, pipes, fittings, pipe supports and hangers, valves, underground tanks, wire, conduit, receptacle and junction boxes, insulation, ductwork and coverings thereof.

2. Contractor will obtain and provide subcontractors with Pennsylvania Exemption Certificates—Pennsylvania Form Rev-1220 AS—to be filled out and used when purchasing tax-exempt "Building Machinery and Equipment" for the project. For purposes of filling out Form Rev-1220 AS, the Owner's tax exempt number is 75-259-773.

3. If Contractor or any subcontractor fails to obtain a sales-tax exemption when purchasing "Building Machinery and Equipment," the Contractor or subcontractor shall be responsible for seeking its own refund of sales tax expending by filing a Refund Petition with the Pennsylvania Department of Revenue Board of Appeals.

Rhode Island

RHODE ISLAND STATE SALES TAX:

Add the following to the Small Project Agreement Between Owner and Contractor (U.S.):

1. Exemption from Rhode Island state sales tax should be allowed for materials purchased by Contractor for this project. Equipment rentals as well as materials not used in the building are subject to state sales tax.

2. The Owner's tax exempt number is 11034.

South Carolina

N/A

South Dakota

Replace section 11 of the Small Project Agreement Between Owner and Contractor (U.S.) with the following:

11. Permits, Surveys, and Taxes. Contractor will obtain and pay for all permits and licenses. Contractor will pay all privilege, sales, use, consumer, payroll, workers compensation, unemployment, old age pension, surtax, and similar taxes assessed in connection with the

performance of the Work (including without limitation all excise tax). Contractor will also obtain and pay for any surveys it needs to perform the Work.

Tennessee

N/A

Texas

TEXAS STATE SALES TAX:

Add the following to the Small Project Agreement Between Owner and Contractor (U.S.):

1. The Church of Jesus Christ of Latter-day Saints is a Religious Organization exempt from sales tax under Texas Tax Code §151.310. The general Contractor, when purchasing materials and equipment for this Project, should advise the vendors that Owner is an exempt organization and that no sales tax will be paid.

Utah

UTAH STATE SALES TAX:

Add the following to the Small Project Agreement Between Owner and Contractor (U.S.):

1. Contractors should be exempt on purchases of material installed or converted into real property to be used by the Owner. The Contractor will furnish each vendor with a completed Exemption Certificate Form TC-721. The certificate will be prepared by the Contractor for each vendor in order to obtain the exemption.

2. The Owner's tax exempt number is 11871701-002-STC.

UTAH NOTICE OF INTENT TO OBTAIN FINAL COMPLETION:

Add the following to the Small Project Agreement Between Owner and Contractor (U.S.):

A. Contractor shall file with the State Construction Registry, on its own behalf and/or on behalf of Owner, a notice of intent to obtain final completion at least 45 days before the day on which the Owner or Contractor files or could file a notice of completion under Utah Code Ann. Section 38-1a-506 if:
    1. The completion of performance time under the original contract for construction work is greater than 120 days;
    2. The total original construction contract price exceeds $500,000; and
    3. The original contractor or owner has not obtained a payment bond in accordance with Utah Code Ann. Section 14-2-1.

UTAH NOTICE OF COMPLETION:

Add the following to the Small Project Agreement Between Owner and Contractor (U.S.):

A. Within five (5) calendar days of final completion of the Project and in compliance with Section 38-1a-507 Utah Code Annotated, Contractor shall file with the State Construction Registry, and copy to Owner, a notice of completion which shall include, without limitation, the following:
    1. The name, address, telephone number, and email address of the person filing the notice of completion;
    2. The name of the county in which the Project and/or Project site is located;
    3. The date on which final completion is alleged to have occurred;
    4. The method used to determine final completion; and
    5. One of the following:
        a. The tax parcel identification number of each parcel included in the Project and/or Project site;

b. The entry number of a preliminary notice on the same project that includes the tax parcel identification number of each parcel included in the Project and/or Project site; or

c. The entry number of the building permit issued for the Project.

B. Notwithstanding any other provision of the Contract Documents to the contrary, Contractor and Owner agree that any breach or failure to comply with this Section by the Contractor will constitute a breach of contract and the Contractor will be liable for any direct, indirect, or consequential damages to the Owner flowing from this breach.

UTAH STATE PROGRESS PAYMENTS AND FINAL PAYMENT:

Replace paragraph 5 of the Small Project Agreement Between Owner and Contractor (U.S.) with the following:

5. Payment

a. If the Contractor's Bid Proposal Amount is over $100,000, Contractor will submit to Owner a schedule of values which allocates the Contractor's Bid Proposal Amount to various portions of the Work. This schedule, when accepted by Owner, will be used as a basis for reviewing Contractor's payment requests.

b. Progress Payments: Not more than once each month, Contractor will submit a payment request to Owner. Owner will pay Contractor progress payments for work completed within fifteen (15) days after Owner receives:

1. Contractor's progress payment request for work to date;
2. A certification by Contractor that Contractor has paid for all labor, materials, and equipment relating to the Work covered by prior payment requests and that Contractor will pay for all labor, materials, and equipment relating to the Work covered by the current payment request; and
3. Conditional Waiver and Release Upon Progress Payment documents submitted by Contractor (in content complying with Utah Code § 38-1a-802) executed by each of the subcontractors performing work and/or providing materials covered by the Contractor's progress payment request.

c. Final Payment: Owner will make full and final payment of the Contract Sum due within thirty (30) days of the completion of all of the following requirements:

1. Contractor has submitted its final payment request;
2. Contractor has submitted a certification that Contractor has paid for all labor, materials, and equipment relating to the Work covered by prior payment requests and that Contractor will pay for all labor, materials, and equipment relating to the Work covered by the final payment request; and
3. Contractor has submitted Waiver and Release Upon Final Payment documents (in content complying with Utah Code § 38-1a-802) executed by each of the subcontractors performing work and/or providing materials covered by the Contractor's final payment request.

Acceptance of final payment by Contractor or any Subcontractor will constitute a waiver of claims by the payee except for those claims previously made to Owner in writing and identified by Contractor in its affidavit as still pending.
If the aggregate of previous payments made by Owner exceeds the amount due Contractor, Contractor will reimburse the difference to Owner.

d. Owner may modify or reject any payment request if, in Owner's opinion, the Work for which payment is requested is not acceptable or is less complete than represented on the payment request.

e. Upon receipt of any payment from Owner, Contractor will pay to each Subcontractor the amount paid to Contractor on account of such Subcontractor's portion of the Work.

f. Contractor will maintain a copy of each payment request at the Project site for review by the Subcontractors.

g. No payment made, either in whole or in part, by Owner will be construed to be an acceptance of defective or improper materials or workmanship.

Vermont

VERMONT STATE SALES TAX:

Add the following to the Small Project Agreement Between Owner and Contractor (U.S.):

1. Purchases of building materials and supplies should be exempt from Vermont state sales tax if those materials and supplies are consumed in the construction of this Project.

2. The Owner's tax exempt number is 450-870234341F-01.

Virginia

N/A

Washington

WASHINGTON STATE CONTRACTOR DISCLOSURE NOTICE:

Add the following to the Small Project Agreement Between Owner and Contractor (U.S.):

1. For Projects in state of Washington, the Contractor will provide a 'job site' disclosure notice in accordance with Statute 60.04.230. Contractor will post this notice at the job site. This notice will detail the following:
   a. Legal description and street address of the construction site.
   b. Property Owner's name address, and phone number as shown in the Contract Documents.
   c. Contractor's registration number and identification.
   d. Contractor's business name, address, and telephone number.

WASHINGTON STATE COMPENSATION:

Replace section 4 in the Small Project Agreement Between Owner and Contractor (U.S.) with the following:

1. **Compensation.** Owner will pay Contractor for performance of Contractor's obligations under the Contract Documents the sum of _____ Dollars ($_____) (the "Contract Sum"), plus applicable sales tax. This Contract Sum includes all labor. materials, equipment, tools, costs, expenses, work and services of Contractor and its subcontractors necessary to perform the Work in accordance with the terms of this Agreement, including without limitation travel, communications, and copying costs.

West Virginia

N/A

Wisconsin

N/A

Wyoming

N/A

END OF DOCUMENT

INTRODUCTORY INFORMATION

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PROCUREMENT AND CONTRACTING REQUIREMENTS GROUP

SPECIFICATIONS GROUP

GENERAL REQUIREMENTS SUBGROUP

FACILITY CONSTRUCTION SUBGROUP

SECTION 01 1100

SUMMARY OF WORK

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes But is Not Limited To:
   1. Administrative and procedural requirements Summary of Work requirements.

1.2 WORK COVERED BY CONTRACT DOCUMENTS

A. Provisions contained in Division 01 apply to Sections of Divisions 02 through 49 of Specifications. Instructions contained in Specifications are directed to Contractor. Unless specifically provided otherwise, obligations set forth in Contract Documents are obligations of Contractor.

B. Contractor shall furnish total labor, materials, equipment, and services necessary to perform The Work in accordance with Contract Documents.

1.3 WORK BY OWNER

A. Owner will furnish and install some portions of The Work with its own forces. Contractor will be provided with schedule of when these items are to be performed.
   1. General:
      a. Complete work necessary to accommodate work to be performed by Owner before scheduled date for performance of such work. Contractor will be back charged for actual expenses incurred by Owner for failure to timely complete such work.
      b. Store and protect completed work provided by Owner until date of Substantial Completion.
   2. Work furnished and installed by Owner include, but are not limited to, following:
      a. High Security Cylinders and Cores:
      b. Selected Commercial Toilet Accessories.
      c. Carpet and Carpet Base.
      d. Owner will terminate building telephone cables at terminal board.

PART 2 - PRODUCTS Not Used

PART 3 - EXECUTION Not Used

END OF SECTION

SECTION 01 1400

WORK RESTRICTIONS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes But is Not Limited To:
   1. Administrative and procedural requirements for Work Restrictions.

1.2 PROJECT CONDITIONS

A. During construction period, Contractor will have use of premises for construction operations. Contractor will ensure that Contractor, its employees, subcontractors, and their employees comply with following requirements:
   1. Confine operations to areas within Contract limits shown on Drawings. Do not disturb portions of site beyond Contract limits.
   2. Do not allow alcoholic beverages, illegal drugs, or persons under their influence on Project site.
   3. Do not allow use of tobacco in any form on Project Site.
   4. Do not allow pornographic or other indecent materials on site.
   5. Do not allow work on Project site on Sundays except for emergency work.
   6. Refrain from using profanity or being discourteous or uncivil to others on Project Site or while performing The Work.
   7. Wear shirts with sleeves, wear shoes, and refrain from wearing immodest, offensive, or obnoxious clothing, while on Project Site.
   8. Do not allow playing of obnoxious and loud music on Project Site. Do not allow playing of any music within existing facilities.
   9. Do not build fires on Project Site.
   10. Do not allow weapons on Project Site, except those carried by law enforcement officers or other uniformed security personnel who have been retained by Owner or Contractor to provide security services.
   11. Reasonably accommodate use of existing facilities by Owner.

B. Do not load or permit any part of the structure to be loaded with a weight that will endanger its safety. Questions of structural loading as part of construction means and methods shall be addressed by a licensed structural engineer engaged by Contractor, subject to the review by Architect.

PART 2 - PRODUCTS Not Used

PART 3 - EXECUTION Not Used

END OF SECTION

SECTION 05 5871

METAL BRACKETS

PART 1 - GENERAL

1.1 SUMMARY

A. Products Supplied But Not Installed Under This Section:
   1. Metal Brackets:
      a. Metal brackets necessary to support Vanities in Mother's Room.

B.

1.2 REFERENCES

A. Reference Standards (Metal Brackets):
   1. ASTM International:
      a. ASTM A36/A36M-14, 'Standard Specification for Carbon Structural Steel'.

PART 2 - PRODUCTS

2.1 FABRICATED UNITS

A. Materials:
   1. Metal Brackets:
      a. Steel: Meet requirements of ASTM A36/A36M.
      b. Fabrication:
         1) Fabricate as detailed.
         2) Grind exposed welds smooth and polish to match non-welded metal finish.
         3) After fabrication and drilling of mounting holes, shop prime.
         4) Paint metal brackets to match wall color.

PART 3 - EXECUTION: Not Used

END OF SECTION

SECTION 06 1100

WOOD FRAMING

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Furnish and install wood framing and blocking for new wall between new toilet room and clerks office. Frame wall with 2 x 6 framing at 16" o.c. Provide blocking for all accessories. Fully insulate wall.

B. Association Publications:
   1 American Lumber Standard Committee (ALSC) (Maintains NIST standard):
      a. Voluntary Product Standard:
         1) PS 20-15, 'American Softwood Lumber Standard'.
   2. National Institute of Standards and Technology (NIST), U. S. Department of Commerce:
      a. Voluntary Product Standard DOC PS 20-15, 'American Softwood Lumber Standard'.

C. Qualifications:
   1. Suppliers:
      a. Licensed by American or Canadian Institute of Timber Construction, or American Wood Systems.
      b. Category Three Approved Suppliers Approved Supplier(s):
         1) Approval subject to agreement process approval.

1.2 DELIVERY, STORAGE, AND HANDLING

A. Delivery And Acceptance Requirements:
   1. Protect lumber and sheathing and keep under cover in transit and at job site.
   2. Do not deliver material unduly long before it is required.

B. Storage And Handling Requirements:
   1. Store lumber and sheathing on level racks and keep free of ground to avoid warping.
   2. Stack to insure proper ventilation and drainage.

C. Dimension Lumber:
   1. Design Criteria:
      a. Grading:
         1) Lumber: Dimension lumber shall conform to CSA-O141 Species Group CSA-O86.1 as listed, and to National Lumber Grades Authority Standard Grading Rules, 1980 and Supplement 1 of 1984.
         2) Plywood: Canadian softwood plywood shall conform to CSA O151, standard grade, unless specified otherwise.
      b. Identify lumber and sheathing/plywood by grade mark or Certificate of Inspection issued by approved lumber grading or inspection bureau or agency. Graded American lumber may be used, subject to CLSAB approval.
      c. Lumber 2 inches (50 mm) or less in nominal thickness shall not exceed 19 percent in moisture content at time of fabrication and installation and be stamped 'S-DRY', 'K-D', or 'MC15'.
      d. Preservative Treated Plates / Sills:
         1) 2x4 (38 mm by 64 mm): Standard and better Douglas Fir, Southern Pine, or HemFir, or StrandGuard by iLevel by Weyerhaeuser Boise, ID www.ilevel.com. (LSL 1.3 E)

2) 2x6 (38 mm by 140 mm) And Wider: No. 2 or or MSR 1650f - 1.5e Douglas Fir, Southern Pine, HemFir, or StrandGuard by iLevel by Weyerhaeuser, Boise, ID www.ilevel.com. (LSL 1.3 E).

PART 2 - EXECUTION

2.1 INSTALLATION

A. General:
1. Use preservative treated wood for wood members in contact with concrete or masonry, including wall, sill, and ledger plates, door and window subframes and bucks, etc.

B. Tolerances:
1. Walls:
   a. 1/4 inch (6 mm) in 20 feet (6 meters), non-cumulative in length of wall.
   b. 1/8 inch (3 mm) in 10 feet (3 meters) with 1/4 inch (6 mm) maximum in height of wall.
   c. Distances between parallel walls shall be 1/4 inch (6 mm) maximum along length and height of wall.

C. Walls:
1. Openings: Single, bearing stud supporting header and one adjacent (king) stud continuous between top and bottom plates, unless shown otherwise.
2. Corners And Partition Intersections: Triple studs.
3. Top Plates In Bearing Partitions: Doubled or tripled and lapped. Stagger joints at least 48 inches (1 200 mm).
4. Stud Walls To Masonry. Use one of the following methods:
   a. Connect with 1/2 inch (13 mm) machine bolts 6 inches (150 mm) from top, 6 inches (150 mm) from bottom, and 48 inches (1 200 mm) maximum on center. Use three bolts minimum in height of 6 foot (1 800 mm) or higher wall.
   b. Secure wood to masonry using continuous 1/4 inch (6 mm) minimum bead of construction adhesive and powder actuated fasteners installed at 32 inches (800 mm) on center minimum.
5. Firestops:
   a. Horizontal or vertical concealed spaces in walls, light coves, soffits, drop ceilings, and other features over 10 feet (3 000 mm) in length or height, and at stairs, ceiling levels, floor levels, and other junctures of horizontal to vertical concealed spaces.
   b. Within concealed spaces of exterior wall finishes and exterior architectural elements, such as trims, cornices or projections, at maximum intervals of 20 feet (6 000 mm), length or height.
6. Sill Plates:
   a. Shear Walls And Bearing Walls:
      1) Provide specified anchor 12 inches (300 mm) maximum and 4 inches (100 mm) minimum from each end of each plate.
      2) Shear Walls: Fasten with anchor bolts embedded in concrete or with screw anchors.
      3) Bearing Walls: Fasten with anchor bolts embedded in concrete, or with screw anchors or expansion bolts in drilled holes.
   b. Non-Structural Walls: Fasten with powder actuated fasteners.
   c. In addition to requirements of paragraphs 'a' and 'b' above, set sill plates of interior walls measuring less than 36 inches (900 mm) in length in solid bed of specified construction adhesive, except where sill sealer is used.
   d. Install specified seal sealer under sill plates of exterior walls of main building and of acoustically insulated interior walls.
   e. Masonry Wall Plates:
      1) Anchor 2x6 and 2x8 wall plates to top of block walls with 5/8 inch (16 mm) diameter anchor bolts at 32 inches (800 mm) on center unless noted otherwise.
      2) Set plates on masonry bearing walls true and level to provide full bearing. Use mortar as specified in Division 04 for leveling if leveling is required.

7. Furnish and install back blocking in wood framing required for joints in gypsum wallboard.
   a. Install back blocking between I-joist framing members with equivalent of Simpson Z2 clips attached with four 10d x 1-1/2 inches (38 mm) nails at each end, two into 'I' joist and two into blocking.
   b. Attach back blocking at trusses, stick framing, or walls with two 10d nails in each end of each piece of blocking.

D. Accessory / Equipment Mounting And Standing & Running Trim Blocking (nailers) for Metal Framing:
   1. Furnish and install blocking in wood framing required for hardware, specialties, equipment, accessories, and mechanical and electrical items, etc.
   2. Attach blocking not installed with clips with two fasteners in each end of each piece of blocking.

E. Furring Strips:
   1. On Wood or Steel: Nail or screw as required to secure firmly.
      a. Ceiling:
         1) Attach furring strips to the underside of structural elements with #8 wood screws, of length to penetrate wood framing 1 inch (25 mm) minimum.

END OF SECTION

SECTION 06 2024

DOOR, FRAME, AND FINISH HARDWARE INSTALLATION

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Furnish and install sealants for caulking door frames as described in Contract Documents.
   2. Furnish and install insulation in doorframes as described in Contract Documents.

B. Products Installed But Not Furnished Under This Section:
   1. Flush wood doors.
   2. Hollow metal door frames.
   3. Finish hardware.

1.2 ADMINISTRATIVE REQUIREMENTS

A. Pre-Installation Conference.
   1. Participate in pre-installation conference.
   2. In addition to agenda items specified in Section 01 3100, review following:
      a. Schedule conference after hardware has been delivered to site and organized into hardware groups by door, but before installation of hardware.
      b. Check for appropriate blocking and for correct hardware models and fasteners for substrates.
      c. Review submittals and set of Manufacturer's installation, adjustment, and maintenance instructions submitted under Section 08 7101.
      d. Review use of crowbar or other prying devices are not permitted to be used to set door frame into wall opening.

1.3 SUBMITTALS

A. Informational Submittals:
   1. Installer Report:
      a. Report verifying correct operation and adjustment of installed hardware.
   2. Special Procedure Submittals:
      a. Copy of 'Installation Guide for Doors & Hardware' by Door & Hardware Institute. Guide may be obtained from Door and Hardware Institute (DHI).

1.4 DELIVERY, STORAGE, AND HANDLING

A. Delivery And Acceptance Requirements:
   1. Wood Doors:
      a. Do not have doors delivered to building site until after plaster, cement, and taping compound are dry.
      b. If doors are to be stored at job-site for more than one week, seal top and bottom edges if not factory sealed.
   2. Metal Frames:
      a. Examine door frames and note damage upon acceptance.

B. Storage And Handling Requirements:
   1. Wood Doors:
      a. Store flat on a level surface in a dry, well ventilated building.
         1) Cover to keep clean but allow air circulation
      b. Handle with clean gloves and do not drag doors across one another or across other surfaces.
      c. Do not subject doors to abnormal heat, dryness, or humidity or sudden changes therein
         1) Condition doors to average prevailing humidity of locality before hanging.
      d. Protect wood frames from damage before and during installation.
   2. Metal Frames:
      a. Protect metal frames from damage before and during installation.

PART 2 - PRODUCTS: Not Used

PART 3 - EXECUTION

3.1 INSTALLATION

A. Hollow Metal Frames:
   1. Site Tolerances:
      a. Squareness: 1/16 inch (1.6 mm) from top edge to opposite top edge.
      b. Plumbness: 1/16 inch (1.6 mm) from top of jamb to bottom of jamb.
      c. Alignment: 1/16 inch (1.6 mm) from plane of left side face of jamb to right side face of jamb.
      d. Twist: 1/16 inch (1.6 mm) across throat of jamb plane measured across each face to plane of opposite jamb throat.
      e. Finished Clearance Between Door And Frame:
         1) 1/16 inch (1.6 mm) at head and hinge jamb plus 1/16 inch (1.6 mm) maximum
         2) 1/8 inch (3 mm) at strike jamb plus or minus 1/16 inch (1.6 mm) maximum.
         3) 1/2 inch (12.7 mm) to top of finished floor surface or 1/4 inch (6 mm) to top of threshold, plus or minus 1/16 inch (1.6 mm) maximum.
   2. Set frame in location and level head.
      a. Use of crowbar or other prying device to set door frame into wall opening will damage door frames and are not permitted to be used.
   3. Equalize with adjustable floor anchor.
   4. Set spreaders and fasten jambs to floor and wall.
      a. Wood spreaders shall be square, fabricated from lumber one inch minimum thick, be same length as door opening at header, and same depth as frame.
      b. Cut notches for frame stops.
      c. Do not remove spreaders until frames are permanently anchored in wall.
      d. Use one spreader at base of frame and another at strike level.
      e. Do not use temporary spreaders welded to base of jambs during installation of frame.
   5. Fill gap between frame and framing with urethane foam or tightly-packed fiberglass insulation. If urethane foam is used, foam interior of frames before installing frame. Trim excess before installation of frame.
   6. Caulking:
      a. Caulk around both sides of frames of doors receiving acoustical seals with specified sealant.

B. Doors:
   1. When Project is completed, doors shall not bind, stick, or be mounted so as to cause future hardware difficulties.
   2. Do not impair utility or structural strength of door in fitting of door, applying hardware, or cutting and altering door louvers, panels, or other special details.

C. Hardware:
   1. General:

a. Install using set of Manufacturer's installation, adjustment, and maintenance instructions submitted with hardware under Section 08 7101. Follow as closely as possible.
b. Mount closers on jamb stop side of door in parallel arm configuration where it is physically possible to do so and not damage or hinder operation of door or closer.

2. Hardware for Wood Doors.
a. If doors are not factory-machined, use hardware templates furnished by Hardware Manufacturer when mounting hardware.
b. Set hinges flush with edge surface. Be sure that hinges are set in a straight line to prevent distortion.
c. Mount door latches high in strike plate opening so when door later settles, latch will not bind.

3.2 FIELD QUALITY CONTROL

A. Field Tests:
1. Arrange to have keys brought to Project site and, in meeting attended by local representatives and Architect, test every new key and locking mechanism.

B. Non-Conforming Work: Non-conforming work as covered in the General Conditions applies, but is not limited to the following:
1. Correct any work found defective or not complying with contract document requirements at no additional cost to the Owner.
2. Door frames:
a. Door frames damaged by use of crowbar or other prying devices to set door frames shall be repaired or replaced at no additional cost to Owner.

3.3 CLOSEOUT ACTIVITIES

A. Instruction of Owner:
1. Using Owner's Operations And Maintenance Manual, explain keying systems at same time keys and locking mechanisms are tested.

B. Key Delivery:
1. Immediately before Final Acceptance Meeting, turn change keys over to Owner properly organized, tagged, and placed in new or existing key cabinet.

END OF SECTION

SECTION 06 2210

MISCELLANEOUS WOOD TRIM

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Furnish and install hardwood chair railing in 2nd floor classroom, former toilet room, install new hardwood chair railing in new mothers room location. Match existing hardwood profile.

B. Association Publications:
   1. Architectural Woodwork Institute / Architectural Woodwork Manufacturers Association of Canada / Woodwork Institute, 46179 Westlake Drive, Suite 120, Potomac Falls, VA www.awinet.org.
      a. Architectural Woodwork Standards (AWS), 2nd Edition, 2014.

C. Definitions:
   1. Grade: Unless otherwise noted, this term means Grade rules for Economy, Custom, and/or Premium Grade:
      a. Custom Grade: Typically specified for and adequately covers most high-quality architectural woodwork, providing a well-defined degree of control over a project's quality of materials, workmanship, or installation.
   2. Plain-Sawn: A hardwood figure developed by sawing a log lengthwise at a tangent to the annual growth rings. It appears as U-shaped or straight markings in the board's face.

1.2 SUBMITTALS

1 Approved Fabricator's written guarantee that all Goods and Services will be free from defects in materials and workmanship for a period of five (5) years from date of substantial completion.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Design Criteria:
   1. General:
      a. Meet requirements of Section 06 4001 for general standards for materials and fabrication of Architectural Woodwork.
   2. Clear Finished Hardwood:

2.2 SOURCE QUALITY CONTROL

A. Inspections:
   1. Clear Finished Hardwood:
      a. Match existing building stain colors.

PART 3 - EXECUTION: Not Used

END OF SECTION

SECTION 06 2710

SHELVING

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Furnish and install adjustable shelving not part of casework, including mounting hardware, in new 2nd floor closet, as described in Contract Documents.

B. Related Requirements:
   1. Section 06 4001: 'Common Architectural Woodwork Requirements'.

1.2 REFERENCES

A. Association Publications:
   1. Architectural Woodwork Institute / Architectural Woodwork Manufacturers Association of Canada / Woodwork Institute, 46179 Westlake Drive, Suite 120, Potomac Falls, VA www.awinet.org.
      a. Architectural Woodwork Standards (AWS), 2nd Edition, 2014.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Shelves:
   1. Design Criteria:
      a. Conform to applicable requirements of Sections 06 4001.
      b. Fabricate the work of this section to AWS 'Custom Grade'.
      c. Species as acceptable for AWS 'Custom Grade'.
   2. Material:
      a. Panel Product:
         1) Glues (adhesives) used in manufacture and fabrication of panel products shall be Type I or II.
         2) Moisture content shall be same as specified for lumber.
         3) Cores:
            a) All Other: Industrial grade particle board with minimum density of 45 lbs per cu ft (721 kg per cu meter).
         4) Facings:
            a) All facings shall be Melamine or Kortron
         5) Thickness:
            a) 30 Inch (750 mm) Span And Less: 3/4 inch (19 mm) thick.
            b) Spans Over 30 Inches (750 mm) To 42 Inches (1 050 mm): One inch (25 mm) thick.
            c) Spans Over 42 inches (1 050 mm): One inch (25 mm) thick and provide equal center supports.
      b. Edgings:
         1) Use 3/4 inch (19 mm) Kortron or Melamine faced Panel Product with hot glued 3 mm thick PVC with eased edges. Apply banding on all four edges of adjustable shelving and on exposed edges of fixed shelving, with one-inch return onto unexposed edges. Edge banding color to match Panel Product.

B. Shelf Supports In Storage Building: 1x4 solid stock Pine, C or better, S4S.

2.2 ACCESSORIES

A. Manufacturer:
   1. Manufacturer Contact Information:
      a. Knape & Vogt, Grand Rapids, MI www.knapeandvogt.com or Knape & Vogt Canada Inc, Mississuaga, ON (905) 676-8166.

B. Shelf Brackets And Standards In Main Building:
   1. Brackets:
      a. Size according to shelf width, end of bracket to be within 2 inches (50 mm) of front edge of shelf.
      b. Category Four Approved Product. See Section 01 6200 for definitions of Categories.
         1) 187WH extra heavy duty brackets by Knape & Vogt.
   2. Standards:
      a. Category Four Approved Product. See Section 01 6200 for definitions of Categories.
         1) 87WH extra heavy duty standard by Knape & Vogt.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Attach metal standards by screws into framing members or special blocking. Utilize all available pre-drilled screw holes in standards.

B. Attach wood shelf supports with 16d finish nails through sheathing into framing members or special blocking, two nails minimum into each framing member. Attach shelves to supports with 1-1/2 inch (38 mm) long minimum flathead screws with heads countersunk to be flush or slightly below shelf surface, one screw at each shelf corner minimum.

END OF SECTION

SECTION 06 4001

COMMON ARCHITECTURAL WOODWORK REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. General standards for materials and fabrication of Architectural Woodwork and for hardware associated with Architectural Woodwork.

B. Related Requirements:
   1. Section 06 1100: 'Wood Framing' for furring and blocking.
   2. Section 06 2001: 'Common Finish Carpentry Requirements' for Installation.
   3. Section 06 2210: 'Miscellaneous Wood Trim'.
   4. Section 06 4005: 'Plastic Laminate'.
   5. Section 06 4114: 'Wood-Veneer-Faced Architectural Cabinets'.
   6. Section 06 4512: 'Architectural Woodwork Wood Trim'.
   7. Section 09 9324: 'Interior Clear-Finished Hardwood' for filling of nail holes and finishing.

1.2 REFERENCES

A. Association Publications:
   1. Architectural Woodwork Institute / Architectural Woodwork Manufacturers Association of Canada / Woodwork Institute, 46179 Westlake Drive, Suite 120, Potomac Falls, VA www.awinet.org.
      a. Architectural Woodwork Standards (AWS), 2nd Edition, 2014.

B. Definitions:
   1. Grade: Unless otherwise noted, this term means Grade rules for Economy, Custom, and/or Premium Grade:
      a. Custom Grade: Typically specified for and adequately covers most high-quality architectural woodwork, providing a well-defined degree of control over a project's quality of materials, workmanship, or installation.

1.3 SUBMITTALS

A. Action Submittals:
   1. Product Data:
      a. Manufacturer's literature for specialty items and hardware not manufactured by Architectural Woodwork fabricator.
   2. Shop Drawings:
      a. Category Three Approved Fabricator:
         1) Fabricator First Submittal:
            a) Provide 1/4 inch (or larger) scale building layout and/or description of required room walls required for field dimension for Field Quality Control Submittal. Provide submittal before rough framing is completed.
         2) Fabricator Second Submittal:
            a) Provide shop drawings for cabinet and casework that are included for project showing details, casework locations and layout and required dimensions based on Field Quality Control Submittals for compliance to Contract Drawings for approval to Project Architect.

B. Informational Submittals:
   1. Field Quality Control Submittals:

a. Contractor First Submittal:
   1) Provide verification field dimensions and updated Contract Drawings of all areas requested from Fabricator First Submittal from Category Three Approved Fabricator including but limited to the following:
      a) Field dimensions (finish wall dimensions) of all walls with casework.
   2) Submit First Submittal to Category Three Approved Fabricator within three (3) days of completion of gypsum board installation but before gypsum board finishing to allow Category Three Approved Fabricator necessary time to complete casework.

C. Action Submittals:
   1. Product Data:
      a. Manufacturer's literature for specialty items and hardware not manufactured by Architectural Woodwork fabricator.
   2. Shop Drawings:
      a. Fabricator:
         1) Provide shop drawings for cabinet and casework that are included for project showing details, casework locations and layout in compliance with Contract Drawings.

D. Informational Submittals:
   1. Qualification Statement:
      a. Fabricator:
         1) Provide Qualification documentations as requested.

1.4 QUALITY ASSURANCE

A. Qualifications: Requirements of Section 01 4301 applies, but not limited to following:
   1. Fabricator:
      a. Category Three Approved Fabricators:
         1) Approval subject to agreement process approval.
      b. Alternate Fabricator(s):
         1) Fabricator Firm specializing in performing work of this section:
            a) Minimum five (5) years experience in Woodwork installations.
            b) Minimum five (5) satisfactorily completed installations in past three (3) years of projects similar in size, scope, and installation procedures required for this project before.
            c) Firm experience in supplying products indicated for this Project.
            d) Financial stability.
            e) Sufficient production capacity to produce required units.
            f) Comply with specifications and Contract Documents.
            g) Agree to complete reporting documents, including: Agree to provide total costs to the Church including breakdown costs of millwork.
         2) Submit documentation to Architect or Owner.

1.5 DELIVERY, HANDLING, AND STORAGE

A. Delivery And Acceptance Requirements:
   1. Fabricator Responsibility:
      a. Assemble architectural woodwork at Architectural Woodwork Fabricator's plant and deliver ready for erection insofar as possible.
      b. Protect architectural woodwork from moisture and damage while in transit to job site.
   2. General Contractor Responsibility:
      a. Report damaged materials received within two (2) days from delivery at project site.

B. Storage And Handling Requirements:
   1. General Contractor Responsibility:
      a. Unload and store in place where it will be protected from moisture and damage and convenient to use.

1.6 WARRANTY

A. Manufacturer Extended Warranty:
   1. Approved Fabricator's written guarantee that all Goods and Services will be free from defects in materials and workmanship for a period of five (5) years from date of substantial completion.

PART 2 - PRODUCTS

A. Approved Fabricators. See Section 01 4301 for Qualification Requirements.
   1. Category Three Approved Fabricators. See Section 01 6200 for definitions of Categories and Section 01 4301 for Qualification Requirements:
      a. Anderson Cabinet and Millwork, 198 North 4700 East, Rigby, ID 83442.
         1) Contact Information: Matt Miller phone (208) 538-7415 cell (208) 317-7412 e-mail matt@andersoncabinet.com.
      b. Michael Seiter & Co., Inc., P.O. Box 315 Heber City, UT 84032.
         1) Contact Information: Mark Seiter phone (435) 654-0601 fax (435) 654-0613 e-mail mark@msandcoinc.com.
      c. Thompson and Sons Cabinets, 11834 N. 3400 West, Deweyville, UT 84309.
         1) Contact Information: David Thompson cell (435) 230-0876 office (435) 257-7152 e-mail zcabinets@comcast.net.

2.2 ASSEMBLIES

A. Design Criteria:
   1. General:
      a. AWS Custom Grade is minimum acceptable standard, except where explicitly specified otherwise, for materials, construction, and installation of architectural woodwork.
   2. Materials:
      a. Lumber:
         1) Grade:
            a) No defects in boards smaller than 600 sq in (3 871 sq cm).
            b) One defect per additional 150 sq inches (968 sq cm) in larger boards.
            c) Select pieces for uniformity of grain and color on exposed faces and edges.
            d) No mineral grains accepted.
         2) Allowable Defects:
            a) Tight knots not exceeding 1/8 inch (3 mm) in diameter. No loose knots permitted.
            b) Patches (dutchmen) not apparent after finishing when viewed beyond 18 inches (450 mm).
            c) Checks or splits not exceeding 1/32 inch by 3 inches (1 mm by 75 mm) and not visible after finishing when viewed beyond 18 inches (450 mm).
            d) Stains, pitch pockets, streaks, worm holes, and other defects not mentioned are not permitted.
            e) Normal grain variations, such as cats eye, bird's eye, burl, curl, and cross grain are not considered defects.
         3) Use maximum lengths possible, but not required to exceed 10 feet (3 meters) without joints. No joints shall occur closer than 72 inches (1 800 mm) in straight runs exceeding 18 feet (3 600 mm). Runs between 18 feet (3 600 mm) and 10 feet (3 meters) may have no more than one joint. No joints shall occur within 72 inches (1 800 mm) of outside corners nor within 18 inches (450 mm) of inside corners.
         4) Moisture content shall be six (6) percent maximum at fabrication. No opening of joints due to shrinkage is acceptable.

B. Fabrication:
   1. Follow Architectural Woodwork Standards (AWS) for fabrication of Architectural Woodwork.
   2. Tolerances:
      a. No planer marks (KCPI) allowed. Sand wood members and surfaces with 100 grit or finer.
      b. Maximum Gap: None allowed.

c. Flushness Variation: 0.015 inch (0.4 mm) maximum.
d. Sanding Cross Scratches: 1/4 inch (6 mm) maximum.
e. Plug screw holes. Screw locations not to be visible beyond 18 inches (450 mm).

3. Fabricate work in accordance with measurements taken on job site.
4. 'Ease' sharp corners and edges of exposed members to promote finishing and protect users from slivers. Radius of 'easing' shall be uniform throughout Project and between 1/32 and 1/16 of an inch (0.8 and 1.6 of a millimeter).
5. Fabricate so veneer grain is vertical.
6. Joints:
   a. Use lumber pieces with similar grain pattern when joining end to end.
   b. Compatibility of grain and color from lumber to panel products is required.
7. Install hardware in accordance with Manufacturer's directions. Leave operating hardware operating smoothly and quietly.
8. Remove or repair damaged surface of or defects in exposed finished surfaces of architectural woodwork to match adjacent similar undamaged surface.

PART 3 - EXECUTION: Not Used

END OF SECTION

SECTION 06 4005

PLASTIC LAMINATE

PART 1 - GENERAL

1.1 SUMMARY

A. Products Furnished But Not Installed Under This Section:
   1. Wall-hung counters.
   2. Countertops for custom casework.

B. Related Requirements:
   1. Section 06 2001: 'Common Finish Carpentry Requirements':
      a. Installation of wall-hung counters.
      b. Installation of countertops for custom casework.
   2. Section 06 4001: 'Common Architectural Woodwork Requirements':
      a. Approved Fabricators.
      b. General standards for materials and fabrication of Architectural Woodwork.

1.2 REFERENCES

A. Association Publications:
   1. Architectural Woodwork Institute / Architectural Woodwork Manufacturers Association of Canada / Woodwork Institute, 46179 Westlake Drive, Suite 120, Potomac Falls, VA www.awinet.org.
      a. Architectural Woodwork Standards (AWS), 2nd Edition, 2014.

B. Definitions:
   1. Flame Spread: The propagation of flame over a surface.
      a. Flame Spread Index: The numerical value assigned to a material tested in accordance with ASTM E84 or UL 723.
   2. Smoke-Developed Index: The numerical value assigned to a material tested in accordance with ASTM E84 or UL 723.

C. Reference Standards:
   1. ASTM International:
      a. ASTM E84-18, 'Standard Test Method for Surface Burning Characteristics of Building Materials'.
      b. ASTM E162-15a, 'Standard Test Method for Surface Flammability of Materials Using a Radiant Heat Energy Source'.
   2. Kitchen Cabinet Manufacturers Association:
      a. ASTM/KCMA A161.1-2012, 'Performance And Construction Standards For Kitchen And Vanity Cabinets'.
   3. National Electrical Manufacturer's Association / American National Standards Institute:
      a. ANSI/NEMA LD-3-2005, 'High Pressure Decorative Laminates'.
   4. Underwriters Laboratories, Inc.:
      a. UL 723: 'Standard for Safety Test for Surface Burning Characteristics of Building Materials'; (10th Edition).

1.3 SUBMITTALS

A. Action Submittals:
   1. Product Data:
      a. Color selections.
      b. Manufacturer's technical data sheet.

B. Informational Submittals:
   1. Certificates:
      a. Provide Manufacturer's certification of compliance to ANSI/NEMA LD 3.
   2. Test And Evaluation Reports:
      a. Test reports: Certified test reports showing compliance with specified performance characteristics and physical properties for Quality Assurance if requested by Owner or Architect.

C. Closeout Submittals:
   1. Include following in Operations And Maintenance Manual specified in Section 01 7800:
      a. Record Documentation:
         1) Manufacturers documentation:
            a) Manufacturer's literature for plastic laminate.
            b) Color selections.

1.4 QUALITY ASSURANCE

A. Regulatory Agency Sustainability Approvals:
   1. Fire-Test-Response Characteristics: Provide plastic laminate with surface burning characteristics as determined by testing identical products by qualified testing agency.
      a. Surface-Burning Characteristics:
         1) Plastic Laminate shall have Class A flame spread rating in accordance with ASTM E84 or UL 723 Type 1.
            a) Class A (Flame spread index 0-25; Smoke-developed index 0-450).
            b) Flash point: None.

1.5 WARRANTY

A. Manufacturer Extended Warranty:
   1. Approved Fabricator's written guarantee that all Goods and Services will be free from defects in materials and workmanship for a period of five (5) years from date of substantial completion.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Fabricators:
   1. Approved Fabricators. See Section 06 4001 for Category Three Approved Fabricators.

B. Manufacturers:
   1. Type Two Acceptable Manufacturers:
      a. Formica, Cincinnati, OH www.formica.com or Formica Canada Inc, St Jean sur Richelieu, PQ (450) 347-7541, all matte finish.
      b. Nevamar, Odenton, MD www.nevamar.com.
      c. Pionite Decorative Surfaces, Auburn, ME www.pionite.com.
      d. WilsonArt, Temple, TX www.wilsonart.com or WilsonArt International Inc, Mississuaga, ON (905) 565-1255.
      e. Equal as approved by Architect before bidding. See Section 01 6200.

C. Plastic Laminates:
   1. Design Criteria:
      a. Countertops:
         1) Post-formed front edge and backsplash, except where detailed otherwise, with plastic laminate meeting requirements of ANSI/NEMA LD 3: PF 42.
            a) Vertical Applications: GP 28.

b) Horizontal (other than countertops): GP 38.

2) No raised lip on front edge.

b. Balancing Material: BK 20.

c. AWS Quality Grade: Premium.

2. Assemblies:

a. Countertops shall meet requirements of KCMA A161.1.

b. Adhesives for other than post-formed types shall be spray grade, high heat resistant, neoprene contact adhesive.

Color Scheme Color selected by architect from submitted samples.

PART 3 - EXECUTION: Not Used

END OF SECTION

SECTION 06 4114

WOOD-VENEER-FACED ARCHITECTURAL CABINETS

PART 1 - GENERAL

1.1 SUMMARY

A. Products Furnished But Not Installed Under This Section:
   1. Custom casework.

B. Related Requirements:
   1. Section 06 1100: 'Wood Framing' for wall blocking required for Custom Casework.
   2. Section 06 2001: 'Common Finish Carpentry Requirements' for installation of Custom casework.
   3. Section 06 4001: 'Common Architectural Woodwork Requirements' for:
      a. Approved Fabricators.
      b. General standards for materials and fabrication of Architectural Woodwork and for hardware associated with Architectural Woodwork.
   4. Section 09 9324: 'Interior Clear-Finished Hardwood' for wood finishes.

1.2 REFERENCES

A. Association Publications:
   1. Architectural Woodwork Institute / Architectural Woodwork Manufacturers Association of Canada / Woodwork Institute, 46179 Westlake Drive, Suite 120, Potomac Falls, VA www.awinet.org.
      a. Architectural Woodwork Standards (AWS), 2nd Edition, 2014.
      b. HPVA, NWWDA, or APA.
   2. Hardwood Plywood & Veneer Association (HPVA), Reston, VA www.hpva@hpva.org.
   3. The Engineered Wood Association (APA), Tacoma, WA www.apawood.org.
   4. Window & Door Manufacturers Association (WDMA) Chicago, IL www.wdma@wdma.com.

B. Definitions:
   1. Book-Match: Matching between adjacent veneer leaves on one panel face. Every other piece of veneer is turned over so that the adjacent leaves are "opened" as two pages in a book. The fibers of the wood, slanting in opposite directions in the adjacent leaves, create a characteristic light and dark effect when the surface is seen from an angle.
   2. Face Veneer: The outermost exposed wood veneer surface of a veneered wood door, panel, or other component exposed to view when the project is completed.
   3. Grade: Unless otherwise noted, this term means Grade rules for Economy, Custom, and/or Premium Grade:
      a. Custom Grade: Typically specified for and adequately covers most high-quality architectural woodwork, providing a well-defined degree of control over a project's quality of materials, workmanship, or installation.
   4. High-Pressure Decorative Laminate (HPDL): Laminated thermosetting decorative sheets intended for decorative purposes. Also known as Plastic Laminate.
   5. Medium Density Fiberboard (MDF): Generic name for a panel or core manufactured from lignocellulosic fibers combined with synthetic resin or other suitable binder and bonded together under heat and pressure in hot press by process in which added binder creates entire bond.
   6. Panel Product: Panels manufactured with differences in core materials, adhesives or binders which affect characteristics of the panels. These include wood veneers and many prefinished wood panels and decorative overlays with aesthetic and performance characteristics.
   7. Plain-Sawn: A hardwood figure developed by sawing a log lengthwise at a tangent to the annual growth rings. It appears as U-shaped or straight markings in the board's face.
   8. Running Match: Each panel face is assembled from as many veneer leaves as necessary. Any portion left over from one panel may be used to start the next.

9. Veneer: A thin sheet or layer of wood, usually rotary cut, sliced or sawn from a log or flitch. Thickness may vary from 1/100 inch (0.3 mm) to 1/4 inch (6.4 mm).

C. Reference Standards:
   1. American National Standards Institute / Builders Hardware Manufacturers Association:
      a. ANSI/BHMA A156.11-2014, 'Cabinet Locks'.
   2. American National Standards Institute / Hardwood Plywood & Veneer Association:
      a. ANSI/HPVA HP-1-2009, 'Standard for Hardwood and Decorative Plywood'.
   3. American National Standards Institute / Window & Door Manufacturers Association (WDMA:
      a. ANSI/WDMA I.S. 6A-13, 'Industry Standard for Architectural Stile and Rails Doors'.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Coordinate the efforts of the various trades affected by the Work of this Section.
   2. Coordinate completion of 2x6 (50mm x 100mm) wall blocking for custom casework.
   3. Coordinate completion of custom casework.

1.4 SUBMITTALS

A. Action Submittals:
   1. Product Data:
      a. Manufacturer's literature or cut sheets for hardware.
   2. Shop Drawings:
      a. Confirm compliance with Contract Document requirements as to configuration and dimensions of custom casework.
      b. Include plan and elevation views, materials used, standing and running trim profiles, assembly methods, joint details, fastening methods, accessories, and hardware.
   3. Samples:
      a. Interior Hardwood for Transparent Finish:
         1) Before performing work of this Section, prepare Control Sample, to match sample available from Owner, to be used as finishing standard for interior clear finished hardwood as specified in Section 09 9324.
         2) Design Criteria:
            a) Provide 8 inch by 10 inch (200 mm by 255 mm) sample(s) of Red Oak to match Owner provided stain color selected for Project.
            b) Control Sample will be used as performance standard for evaluating finish provided.

B. Informational Submittals:
   1. Source Quality Control Submittals:
      a. Samples:
         1) Interior Hardwood for Transparent Finish:
            a) Finish to match existing stains.
   2. Special Procedure Submittals:
      a. Copy of AWS manual with shop drawing submission.

1.5 QUALITY ASSURANCE

A. Mockups:
   1. Before fabrication of complete casework package, submit section or sections of cabinetry containing typical drawer, shelving, cabinet door panel, and hardware.
   2. Match Owner provided selected sample finish specified in Section 09 9324.
   3. Mockups may be installed in Project after approval.

1.6 WARRANTY

A. Manufacturer Extended Warranty:
1. Approved Fabricator's written guarantee that all Goods and Services will be free from defects in materials and workmanship for period of five (5) years from date of substantial completion.

PART 2 - PRODUCTS

2.1 ASSEMBLIES

A. Components:
1. Design Criteria:
   a. General:
      1) Except as noted otherwise, fabricate the work of this section according to AWS 'Custom Grade'.
         a) Cabinet door wood grain direction shall run vertically and all doors shall be set matched.
         b) Cabinet drawer front wood grain direction may run vertically or horizontally, with same direction maintained on all cabinet or elevation of cabinets.
      2) Casework Construction Type:
         a) Type B: Face-frame construction where front edge of cabinet body components are overlaid with frame.
      3) Door interface style:
         a) Type B Construction: Flush Overlay.
   b. Solid Stock:
      1) Exposed: Plain sawn Red Oak.
      2) Semi-exposed And Concealed: Species as acceptable for AWS 'Custom Grade'.
   c. Panel Product:
      1) Glues (adhesives) used in manufacture and fabrication of panel products shall be Type I or II.
      2) Moisture content shall be same as specified for lumber.
      3) Cores:
         a) Cabinet Doors: Medium density fiberboard (MDF) with minimum density of 48 lbs per cu ft (769 kg per cu meter).
         b) All Other: Industrial grade particle board with minimum density of 45 lbs per cu ft (721 kg per cu meter).
      4) Facings:
         a) Hardwood veneer facings shall be plain sliced Red Oak AWS Grade A, or equal by HPVA, WDMA, or APA.
         b) All other facings shall be Melamine or Kortron.
      5) Edgings:
         a) Shelves And Exposed Panel Product Edges:
            (1) Hot-glued, 3 mm thick, PVC edge-banding. Wood-grain, except color matching Melamine or Kortron surface at shelf edges.
         b) Semi-Exposed Panel Product Edges:
            (1) Hot-glued, 3 mm thick, wood grained PVC edge-banding.
   d. Casework Doors:
      1) Face Veneer:
         a) Design Criteria:
            (1) Plain sliced Red Oak meeting requirements of AWS Grade A. 1/50 inch (0.5 mm) thick minimum immediately before finishing.
            (2) Face veneers shall be running book matched.
      2) Doors under 1-3/8 inch (35 mm) thick: Panel Product.
      3) Doors 1-3/8 inch (35 mm) or more thick:
         a) Door Grade: AWS Custom hollow-core.
         b) Stiles:
            (1) 1-1/4 inches (32 mm) deep minimum before fitting.

(2) 1/4 inch (6 mm) minimum of stile face to be hardwood matching face veneer material.

c) Rails:
(1) 1-1/8 inches (28.5 mm).
(2) Mill option material.

B. Fabrication:
1. Fabricators:
a. Approved Fabricators. See Section 06 4001 for Category Three Approved Fabricators.
2. Cabinet Body:
a. Use AWS Flush Overlay construction on cabinet bodies.
b. If used, install Rail System adjustable shelf supports recessed.
3. Drawers:
a. Fabricate with separate, screw-attached drawer front.
b. Joints shall be dowel and pressure-glued, or lock shoulder, glued, and pin nailed.
c. Set bottoms into sides, backs, and subfront with 1/4 inch (6 mm) deep groove with 3/8 inch (9.5 mm) minimum standing shoulder.
d. Every drawer shall have specified drawer guides and pull installed. Install drawer guides with 'Euroscrews', and pulls with through-bolts passing through both front and sub-front.
4. Cabinet Doors:
a. Full height, panel product cabinet doors may be fabricated in two pieces and joined on back with metal backplate. Backplate shall match interior door surface color.
b. Hinges: Install hinges using plastic insertion dowels for hinges and 'Euroscrews' for baseplates.
c. Every cabinet door shall have specified pull installed.
5. Cabinet Component Thickness And Material:
a. Use hardwood veneer facing on panel product, except on following surfaces:
1) Where Kortron or Melamine shall be used.
2) Cabinet exposed interiors surfaces (not including cabinet doors) and shelving faces behind cabinet doors in all rooms.
3) Cabinet semi-exposed surfaces.
4) Cabinet concealed surfaces.
5) Cabinet exposed exteriors permanently concealed (not exposed to view).
6) Drawer sides, backs, bottoms, and subfronts.
b. Ends, Divisions, Bottoms, Tops: 3/4 inch (19 mm) thick panel product.
c. Rails: 3/4 inch (19 mm) thick panel product.
d. Shelves:
1) Panel product.
2) Thickness:
a) 30 Inch (750 mm) Span And Less: 3/4 inch (19 mm) thick.
b) Spans Over 30 Inches (750 mm) To 42 Inches (1 050 mm): One inch (25 mm) thick.
c) Spans Over 42 inches (1 050 mm): One inch (25 mm) thick and provide Hafele or equal center supports.
e. Backs: 1/4 inch (6 mm) thick panel product.
f. Doors: 3/4 inch (19 mm) thick panel product.
g. Drawer Sides, Backs, And Subfronts: 1/2 inch (12.7 mm) thick minimum panel product.
h. Drawer Bottoms: 1/4 inch (6 mm) thick panel product.
i. Separate Drawer Front:
1) 8 Inches (200 mm) High And Less: 3/4 inch (19 mm) thick solid hardwood.
2) More Than 8 Inches (200 mm) High: 3/4 inch (19 mm) panel product.
j. Hardboard Dividers: 1/4 inch (6 mm) thick panel product.
k. Hardboard Shelves: 1/8 inch (3 mm) thick hardboard, smooth both sides.
6. Cabinet and Drawer Locks:
a. Install only on cabinets and drawers as shown on Contract Documents.
7. Install plastic grommets in cable access holes in countertops located as located on Contract Documents.

C. Finishes:
1. Factory Finishing:

a. Design Criteria:
   1) Applied before leaving factory.
   2) Factory-finish to match Owner selected sample as specified in Section 09 9324.
b. Match existing Project Color Scheme:
   1) Control Sample provided by Owner:
      a) Control Sample will be existing wood item from Project.

2.2 ASSESSORIES

A. Manufacturers:
   1. Manufacturer Contact List for Assessories:
      a. Accuride, Santa Fe Springs, CA www.accuride.com.
      b. Anybumper, Amite, LA www.Anybumper.com.
      c. Blum Inc, Stanley, NC www.blum.com.
      d. CompX National, Mauldin, SC www.nclnet.com.

B. Cabinet Hardware:
   1. Cabinet And Drawer Pulls:
      a. Satin Chromium Plated brass / bronze core bow handles, 4 inches (100 mm) long minimum.
      b. Type Two Acceptable Products:
         1) 4484 by Stanley.
         2) Equal as approved by Architect before installation. See Section 01 6200.
   2. Cabinet And Drawer Locks:
      a. General:
         1) Pin tumbler type suitable for location.
         2) Keying: Key each cabinet and drawer individually as shown on Contract Documents except as follows:
            a) Key each cabinet and drawer within each Office alike.

2.3 SOURCE QUALITY CONTROL

A. Inspections:
   1 Clear Finished Hardwood:
      a. Color matches Owner provided sample specified in Section 09 9324.

PART 3 - EXECUTION: Not Used

END OF SECTION

SECTION 07 2116

BLANKET INSULATION

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Furnish and install faced thermal and acoustic batt insulation in toilet room walls and ceiling.
   2. Furnish and install unfaced thermal insulation in ceilings as described in Contract Documents.

B. Related Requirements:
   1. Section 06 2024: 'Door, Frame, And Finish Hardware Installation' for furnishing and installing of insulation in hollow metal door frames.

1.2 REFERENCES

A. Reference Standards:
   1. ASTM International:
      a. ASTM C665-17, 'Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing'.

1.3 QUALITY ASSURANCE

A. Regulatory Agency Sustainability Approvals:
   1. Insulation shall be manufactured and installed in compliance with International Building Code (IBC) or other applicable building codes.

PART 2 - PRODUCTS

2.1 SYSTEMS

A. Manufacturers:
   1. Insulation:
      a. Type One Acceptable Manufacturers:
         1) Certainteed Corp, Valley Forge, PA www.certainteed.com.
         2) FiberTEK, Salt Lake City, UT www.fibertekinsulation.com.
         3) Guardian Fiberglass, Greer, SC www.guardianbp.com.
         4) Johns Manville, Denver, CO www.jm.com.
         5) Knauf Fiber Glass, Shelbyville, IN www.knaufusa.com.
         6) Owens-Corning Fiberglass Corporation, Toledo, OH www.owens-corning.com.
         7) Thermafiber, Wabash, IL www.thermafiber.com.
      b. Equal as approved by Architect before bidding. See Section 01 6200.

B. Materials:
   1. Thermal And Acoustic Insulation:
      a. Order insulation by 'R' value rather than 'U' value, rating, or thickness, either 16 or 24 inches (400 or 600 mm) wide according to framing spacing.
      b. Unfaced Insulation: Meet requirements of ASTM C665, Type I.
         1)

R-11	3-1/2 inches deep	89 mm deep

R-19	5-1/2 inches deep	140 mm deep
R-25	7-1/4 inches deep	184 mm deep
R-30	9-1/4 inches deep	235 mm deep
R-38	11-1/4 inches deep	286 mm deep

c. Unfaced Insulation:
   1) Friction fit, preformed unfaced mineral fiber insulation meeting requirements of ULC 702.1, Type 1.
   2) Support at trussed rafters:
      a) Provide support at trussed rafters where insulation is not enclosed by structure or drywall.
      b) Provide stings/wires which run perpendicular to framing and attach at each trussed rafter and to framing at 32 inches (800 mm) O.C. minimum and where batt ends adjoin each other.

      or

      c) Class Two Quality Standard: Simpson Strong Tie IS Insulation Supports with 14 gauge (1.89 mm) carbon steel, spring wire and mitered tips for 16 inch (400 mm) O.C. and 24 inch (610 mm) O.C. spacing.

d. 'RSI' Value Required:
   1) Acoustically Insulated Ceilings:
      a) Unenclosed Spaces above Offices and Restrooms: RSI-5.28 (R30).

2.2 ACCESSORIES SYSTEMS

PART 3 - EXECUTION

3.1 INSTALLATION

A. General:
   1. Leave no gaps in insulation envelope.
   2. If two layers of insulation are used to attain required 'R' value, only layer towards interior of building shall have facing.
   3. Provide minimum clearance around recessed lighting fixtures as approved by local code.

B. In Framing:
   1. Install insulation behind plumbing and wiring, around duct and vent line penetrations, and in similar places.
   2. Fit ends of batts snug against top and bottom plates.
   3. Fit batts snug against stud framing at each side.
   4. Where insulation is not enclosed by structure or drywall, support in place with wire or other suitable material as approved by Architect before bid.

C. Attic Baffles:
   1. Install in accordance with manufacturer's instructions.
   2. Install baffles between trusses and rafters at ventilation spaces to prevent insulation from blocking airflow from soffit.

END OF SECTION

SECTION 07 9213

ELASTOMERIC JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Furnish and install sealants not specified to be furnished and installed under other Sections.
   2. Quality of sealants to be used on Project not specified elsewhere, including submittal, material, and installation requirements.

B. Related Requirements:
   1. Furnishing and installing of sealants is specified in Sections specifying work to receive new sealants.

C. Products Furnished But not Installed Under This Section:
   1. Interior Ceramic Tile Joint Sealants:

D. Related Requirements:
   1. Section 09 3013: 'Ceramic Tiling'.

1.2 REFERENCES

1.3 DELIVERY, STORAGE, AND HANDLING

A. Delivery and Acceptance Requirements:
   1. Deliver and keep in original containers until ready for use.
   2. Inspect for damage or deteriorated materials.

B. Storage and Handling Requirements:
   1. Handle, store, and apply materials in compliance with applicable regulations and material safety data sheets (MSDS).
   2. Handle to prevent inclusion of foreign matter, damage by water, or breakage.
   3. Store in a cool dry location, but never under 40 deg F (4 deg C) or subjected to sustained temperatures exceeding 90 deg F (32 deg C) or as per Manufacturer's written recommendations.
   4. Do not use sealants that have exceeded shelf life of product.

1.4 FIELD CONDITIONS

A. Ambient Conditions:
   1. Do not install sealant during inclement weather or when such conditions are expected. Allow wet surfaces to dry.
   2. Follow Manufacturer's temperature recommendations for installing sealants.

1.5 WARRANTY

A. Manufacturer Warranty:
   1. Signed warranties against adhesive and cohesive failure of sealant and against infiltration of water and air through sealed joint for period of three (3) years from date of Substantial Completion.
   2. Sealants For Interior Joints:

a. General:
   1) Countertops and backsplash to wall.
   2) Sinks and lavatories to countertops.
   3) Joints between plumbing fixtures and other substrates.
b. Interior Ceramic Tile Joints are furnished in Section 07 9213 and installed in Section 09 3013 'Ceramic Tiling' including the following:
   1) Ceramic tile inside corners.
   2) Ceramic tile and paver tile joints.
c. Description:
   1) One-part acetoxy cure silicone sealant with fungicides to resist mold and mildew.
d. Design Criteria:
   1) Meet ASTM C920, Type S, Grade NS, NT, and Class 25 test requirements.
   2) 100 percent silicone sealant.
e. Color: As selected by Architect from Manufacturer's standard colors.
f. Category Four Approved Products. See Section 01 6200 for definitions of Categories:
   1) Dow Corning: Tub, Tile, And Ceramic Silicone Sealant.
   2) Laticrete: Latasil Tile and Stone Silicone Sealant.
   3) Momentive Performance Materials (formerly, GE Sealants & Adhesives): GE SCS1700 Sanitary Silicone Sealant.
   4) Tremco: Tremsil 200 Silicone Sealant.

1.6 ACCESSORIES

A. Bond Breaker Tape:
   1. Pressure sensitive tape as by Sealant Manufacturer to suit application.
   2. Provide tape to prevent adhesion to joint fillers or joint surfaces at back of joint and allow sealant movement.

B. Joint Backing:
   1. Comply with ASTM C1330.
   2. Flexible closed cell, non-gassing polyurethane or polyolefin rod or bond breaker tape as recommended by Sealant Manufacturer for joints being sealed.
   3. Oversized 25 to 50 percent larger than joint width.

C. Joint Cleaner:
   1. Non-corrosive and non-staining type as recommended by Sealant Manufacturer, compatible with joint forming materials.

D. Masking Tape:
   1. Non-staining, non-absorbent tape product compatible with joint sealants and adjacent joint surfaces.

PART 2 - EXECUTION

2.1 EXAMINATION

A. Verification Of Conditions:
   1. Examine substrate surfaces and joint openings are ready to receive Work.
      a. Verify each sealant is compatible for use with joint substrates.
      b. Verify joint surfaces are clean and dry.
      c. Ensure concrete surfaces are fully cured.
   2. Sealants provided shall meet Manufacturer's shelf-life requirements.
   3. Notify Architect of unsuitable conditions in writing.
      a. Do not proceed until unsatisfactory conditions are corrected.
   4. Commencement of Work by installer is considered acceptance of substrate.

2.2 PREPARATION

A. Surface Preparation:

B. Joints:
   1. Prepare joints in accordance with ASTM C1193.
      a. Clean joint surfaces of contaminates capable of affecting sealant bond to joint surface using Manufacturer's recommended instructions for joint preparation methods.
      b. Remove dirt, dust, oils, wax, paints, and contamination capable of affecting primer and sealant bond.
      c. Clean concrete joint surfaces to remove curing agents and form release agents.

C. Protection:
   1. Protect elements surrounding the Work of this section from damage or disfiguration.

2.3 APPLICATION

A. General:
   1. Apply silicone sealant in accordance with Manufacturer's instructions.
   2. Do not use damaged or deteriorated materials.
   3. Install primer and sealants in accordance with ASTM C1193 and Manufacturer's instructions.
   4. Apply primer where required for sealant adhesion.
   5. Install sealants immediately after joint preparation.
   6. Do not use silicone sealant as per the following:
      a. Apply caulking/sealant at temperatures below 40 deg F (4 deg C).
      b. Below-grade applications.
      c. Brass and copper surfaces.
      d. Materials bleeding oils, plasticizers, and solvents.
      e. Structural glazing and adhesive.
      f. Surfaces to be immersed in water for prolonged time.

B. Joint Backing:
   1. Install joint backing to maintain sealant joint ratios recommended by Manufacturer.
   2. Install without gaps, twisting, stretching, or puncturing backing material. Use gage to ensure uniform depth to achieve correct profile, coverage, and performance.
   3. Rod for open joints shall be at least 1-1/2 times width of open joint and of thickness to give solid backing. Backing shall fill up joint so depth of sealant bite is no more than 3/8 inch (9.5 mm) deep.

C. Bond Breaker:
   1. Install bond breaker where joint backing is not used or where backing is not feasible.
      a. Apply bond-breaker tape in shallow joints as recommended by Sealant Manufacturer.

D. Sealant:
   1. Apply sealant with hand-caulking gun with nozzle of proper size to fit joints. Use sufficient pressure to insure full contact to both sides of joint to full depth of joint. Apply sealants in vertical joints from bottom to top.
   2. Fill joint opening to full and proper configuration.
   3. Apply in continuous operation.
   4. Tool joints immediately after application of sealant if required to achieve full bedding to substrate or to achieve smooth sealant surface. Tool joints in opposite direction from application direction. i.e., in vertical joints, from the top down. Do not 'wet tool' sealants.
   5. Depth of sealant bite shall be 1/4 inch (6 mm) minimum and 1/2 inch (12.7 mm) maximum, but never more than one half or less than one fourth joint width.

E. Caulk gaps between painted or coated substrates and unfinished or pre-finished substrates. Caulk gaps larger than 3/16 inch (5 mm) between painted or coated substrates.

2.4 TOLERANCES

A. Provide joint tolerances in accordance with Manufacturer's printed instructions.

2.5 FIELD QUALITY CONTROL

A. Adhesion Test (Installer Option to use adhesion test to determine if primer is required).
   1. Perform adhesion tests in accordance with Manufacturer's instructions and ASTM C1193. Method A, Field-Applied Sealant joint Hand-Pull Tab:
      a. Perform five (5) tests for first 1,000 linear feet (300 meters) of applied silicone sealant and one (1) test for each 1,000 linear feet (300 meters) seal thereafter or perform one (1) test per floor per building elevation minimum.
      b. For sealants applied between dissimilar materials, test both sides of joints.
   2. Sealants failing adhesion test shall be removed, substrates cleaned, sealants re-installed, and re-testing performed.
   3. Maintain test log and submit report to Architect indicating tests, locations, dates, results, and remedial actions.

2.6 CLEANING

A. Remove masking tape and excess sealant.

B. Clean adjacent materials, which have been soiled, immediately (before setting) as recommended by Manufacturer.

C. Waste Management: Dispose of products in accordance with manufacturer's recommendation.

END OF SECTION

SECTION 08 0601

HARDWARE GROUP AND KEYING SCHEDULES

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Furnish and install door hardware and keying as described in Contract Documents

1.2 REFERENCES

A. Definitions:
   1. Builders Hardware Manufacturer's Association (BHMA) Hardware Functions:
      a. F76 Privacy Lock: Latch bolt operated by lever from either side. Outside lever locked by push button inside and unlocked by emergency key from outside or rotating lever from inside.
      b. F84 Classroom Deadlock: Dead locking latch bolt operated by lever from either side, except when outside lever is locked, latch bolt is operated by key in outside lever or by rotating inside lever.

1.3 DELIVERY, STORAGE, AND HANDLING

A. Delivery And Acceptance Requirements:
   1. Materials shall be delivered in original, unopened packages with labels intact.

PART 2 - HARDWARE GROUPS

1. **Group 28D**:
   a. 1 set: Smoke Gaskets.
   b. 1 each: Closer.
   c. 3 each: Hinges.
   d. 1 each: Lockset, Function F76.
   e. 1 each: Stop.
   f. 1 each: Kickplate.
   g. 1 each: Marble threshold
2. **Group 37A**:
   a. 1 set: Smoke Gaskets.
   b. 3 each: Hinges.
   c. 1 each: Lockset, Function F84. Key to match existing keyed closet doors.
   d. 1 each: Stop.

3. Match existing hardware color.

END OF SECTION

SECTION 08 7102

HANGING DEVICES

PART 1 - GENERAL

1.1 SUMMARY

A. Products Furnished But Not Installed Under This Section:
   1. Hinges for flush wood doors.

B. Related Requirements:
   1. Section 08 7101: 'Common Hardware Requirements'.

PART 2 - PRODUCTS

2.1 MANUFACTURED UNITS

A. Manufacturers:
   1. Manufacturer Contact List:
      a. Hager Companies, St Louis, MO www.hagerhinge.com.
      b. Ives, New Haven, CT www.iveshardware.com.
      c. McKinney, Scranton, PA www.mckinneyhinge.com.
      d. PBB, Ontario, CA www.pbbinc.com.
      e. Stanley (dormakaba Americas), Indianapolis IN www.stanleyhardwarefordoors.com/products/.

B. Hinges:
   1. Doors:
      a. Sizes:
         1) Fire-Rated Doors:
            a) 1-3/4 inch (45 mm) fire-rated doors in metal frames:
               (1) Standard: 4-1/2 inches by 4-1/2 inches (115 mm by 115 mm).
               (2) Wide Throw: 4-1/2 inches (115 mm) by width required.
   2. Use non-removable pins on exterior opening doors.
   3. Hinges on exterior doors shall be solid brass, plated to achieve specified finish.
   4. Category Four Approved Products. See Section 01 6200 for definitions of Categories:
      a. Interior:
         1) Hager: BB 1279
         2) Ives: 5BBl.
         3) McKinney: TA 2714.
         4) MacPro / McKinney: MPB79.
         5) PBB: BB81.
         6) Stanley: FBB 179.

PART 3 - EXECUTION: Not Used

END OF SECTION

SECTION 08 7103

SECURING DEVICES

PART 1 - GENERAL

1.1 SUMMARY

A. Products Furnished But Not Installed Under This Section:
   1. Items for architectural wood or hollow metal doors:
      a. Locksets and latchsets.
      b. Cylinders.
      c. Interior exit devices.

B. Related Requirements:
   1. Section 08 7101: Common Hardware Requirements.

1.2 REFERENCES

A. Definitions:
   1. Grade 2 Standard Duty Key-In Lever Cylindrical Lockset:
      a. Performance Features:
         1) Exceeds 400,000 ANSI cycles.
         2) Single motion egress provides easy emergency exit.
         3) Full 1 inch (25 mm) throwbolt with saw resistant hardened steel roller pin
         4) Anti-drill design deadbolt. Two (2) ball bearings inserted to prevent drill attacks.
         5) ADA-compliant thumbturn.

1.3 DELIVERY, STORAGE, AND HANDLING

A. Delivery And Acceptance Requirements:
   1. Standard Key Delivery:
      a. Include change keys with hardware.

PART 2 - PRODUCTS

2.1 MANUFACTURED UNITS

A. Manufacturers:
   1. Manufacturer List:
      a. Best Locks by Stanley, Indianapolis IN www.stanleysecuritysolutions.com
      b. Glynn-Johnson, Indianapolis, IN www.glynn-johnson.com.
      c. Hager, St Louis, MO www.hagerhinge.com.
      d. Ives, New Haven, CT www.iveshardware.com.
      e. Knape & Vogt, Grand Rapids, MI www.knapeandvogt.com.
      f. Marks USA, Amityville, NY www.marksusa.com.
      g. Precision Hardware, Romulus, MI www.precisionhardware.com.
      h. Rockwood, Manufacturing Co, Rockwood, PA www.rockwoodmfg.com.
      i. Sargent, New Haven, CT www.sargentlock.com.
      j. Schlage, Colorado Springs, CO www.schlage.com.
      k. Von Duprin, Indianapolis, IN www.vonduprin.com.
      l. Yale Commercial Locks, Lenoir City, TN www.yalecommercial.com.

B. General:
   1. Backsets shall be 2-3/4 inches (70 mm).
   2. Provide metal dust box strikes for wood frames.
   3. Furnish lead shields where required.

C. Flush Bolts:
   1. Rod length: 12 inch (300 mm) minimum.
   2. Type Two Acceptable Products:
      a. Manual Flush Bolts (Wood Doors):
         1) Hager 283D.
         2) Ives FB458.
         3) Rockwood 555.
      b. Manual UL Fire-Rated Flush Bolts (Metal Doors):
         1) Hager 282D.
         2) Ives FB458.
         3) Rockwood 555.
      c. Equal as approved by Architect before installation. See Section 01 6200.
   3. Dust Proof Strike:
      a. Floor and/or threshold.
      b. Type Two Acceptable Products:
         1) Hager: 280X.
         2) Ives: DP2.
         3) Rockwood 570.
         4) Equal as approved by Architect before installation. See Section 01 6200.

D. Locksets And Latchsets:
   1. Design Criteria:
   2. Lever Operated:
      a. Category Four Approved Products. See Section 01 6200 for definitions of Categories:
         1) Grade 2 Standard Duty Key-In Lever Cylindrical Locksets:
         2) 7K Grade 1 Heavy Duty Key-In Lever Cylindrical Locksets (Used only in Meetinghouse Module doors with CES Seminary and Institute additions):
            a) Series Best Lock with 15D Lever by Stanley standard cylinders - (I/C cores may be used when authorized by AEC).
            b) 175 Series with American Lever by Marks USA.
            c) 7 Line Series with L Lever by Sargent.
            d) AL Series with Saturn (SAT) Lever by Schlage.
            e) 5300LN Series with Augusta (AU) Lever by Yale.
   3. Knob Operated:
      a. Category Four Approved Products. See Section 01 6200 for definitions of Categories:
         1) 6 Line Series by Sargent.
         2) A Series by Schlage.

E. Standard Cylinders:

PART 3 - EXECUTION

3.1 CLOSE-OUT ACTIVITIES

A. Owner's Instructions:
   1. Before Final Acceptance Meeting, send master keys to <**Insert Person to Receive Keys**>.

END OF SECTION

SECTION 08 7106

CLOSING DEVICES

PART 1 - GENERAL

1.1 SUMMARY

A. Products Furnished But Not Installed Under This Section:
   1. Closers for flush wood doors and hollow metal doors. Install new closers of family friendly toilet rooms and ADA compliant toilet room doors.

B. Related Requirements:
   1. Section 08 7101: 'Common Finish Hardware Requirements'.
   2. Section 08 7108: 'Stops And Holders'.

1.2 SUBMITTALS

A. Closeout Submittals:
   1. Include following in Operations And Maintenance Manual specified in Section 01 7800:
      a. Warranty Documentation:
         1) Manufacturer's final executed copy of warranty.

1.3 WARRANTY

A. Manufacturer Warranty:
   1. Manufacturer's Standard Warranty, five (5) years minimum.

PART 2 - PRODUCTS

2.1 MANUFACTURED UNITS

A. Manufacturers:
   1. Category Four Approved Manufacturers. See Section 01 6200 for definitions of Categories:
      a. 8900 Series by Dorma Architectural Hardware, Reamstown, PA www.dorma.com/usa.
      b. 1461 Series by LCN Closers, Princeton, IL www.lcnclosers.com.
      c. 8501 Series by Norton Door Controls, Charlotte, NC www.nortondoorcontrols.com.
      d. 1431 Series by Sargent, New Haven, CT www.sargentlock.com.
      e. D-3550/D-3551 Series by Stanley (dormakaba Americas), Indianapolis IN www.stanleyhardwarefordoors.com/products/.

B. Surface-Mounted Overhead Door Closers:
   1. Closers provided under this Section shall be from same Manufacturer.
   2. Provide parallel arms on closers unless door position in relation to adjacent wall requires otherwise. Provide covers.
   3. Door Closers on doors that swing 180 degree as shown on Contract Documents:
      a. Closers shall allow for 180 degree opening without engaging stop function. Wall stop or Floor stop is specified in Door Schedule and Section 08 7108, 'Stops And Holders'.
      b. Closers shall have following features:
         1) Adjustable sweep speed.
         2) Adjustable backcheck.
         3) Non-handed, non-sized.
         4) Delayed action closing where noted on Door Schedule.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Mount closers on stop side of door wherever conditions permit.

B. Provide closer with E/Z close feature for ADA compliant toilet room

3.2 ADJUSTING

A. Adjust closers to provide maximum opening force as required by governing code authority and proper backcheck and sweep speed.

END OF SECTION

SECTION 08 7107

PROTECTIVE PLATES AND TRIM

PART 1 - GENERAL

1.1 SUMMARY

A. Products Furnished But Not Installed Under This Section:
   1. Kick plates. Provide kickplates for the family friendly restrooms and ADA compliant toilet room.

B. Related Requirements:
   1. Section 08 7101: Common Hardware Requirements and VMR Suppliers.

PART 2 - PRODUCTS

2.1 MANUFACTURED UNITS

A. Manufacturers:
   1. Type Two Acceptable Manufacturers:
      a. Glynn-Johnson, Indianapolis, IN www.glynn-johnson.com.
      b. Hager, St Louis, MO (800) 255-3590 or (314) 772-4400 www.hagerhinge.com.
      c. Ives, Wallingford, CT www.iveshardware.com.
      d. Rockwood Manufacturing Co, Rockwood, PA www.rockwoodmfg.com.
      e. Equal as approved by Architect before installation. See Section 01 6200.

B. Protective Plates:
   1. Material: 0.050 inch (1.27) mm thick Stainless Steel.
   2. Sizes:
      a. Kick Plates: 10 inches (255) mm high by width of door less 3/4 inch (19 mm) on each side.

PART 3 - EXECUTION: Not Used

END OF SECTION

SECTION 08 7108

STOPS AND HOLDERS

PART 1 - GENERAL

1.1 SUMMARY

A. Products Supplied But Not Installed Under This Section:
   1. Door stops.
   2. Door stops and holders.

B. Related Sections:
   1. Section 08 7101: Common Hardware Requirements.

PART 2 - PRODUCTS

2.1 MANUFACTURED UNITS

A. Manufacturers:
   1. Manufacturer Contact List:
      a. Glynn-Johnson, Indianapolis, IN www.glynn-johnson.com.
      b. Hager, St Louis, MO www.hagerhinge.com.
      c. Ives, Wallingford, CT www.iveshardware.com.
      d. Rockwood Manufacturing Co, Rockwood, PA www.rockwoodmfg.com.
      e. Sargent, New Haven, CT (800) 906-6606 or (203) 562-2151 www.sargentlock.com

B. Stops:
   1. Provide model appropriate for substrate. Wall stops may be either cast or wrought.
   2. Type Two Acceptable Products:

		Interior Wall	Exterior Wall	Floor Mount	Overhead
a.					
b.	Hager	236W	255W	243F	- - -
c.	Ives	WS407CCV	WS447	FS438	- - -
d.	Rockwood	409	474 / 475	440 / 441	- - -
e.	Glynn Johnson	- - -	- - -	- - -	GJ 90S
f.	Sargent	- - -	- - -	- - -	590S Series

   g. Equal as approved by Architect before Installation. See Section 01 6200.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Interface With Other Work: When using overhead stops, coordinate installation with door closer and other door hardware.

END OF SECTION

SECTION 08 7109

ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

A. Products Furnished But Not Installed Under This Section:
   1. Smoke Gaskets.
   2. Section 09 3013: 'Ceramic Tiling' for stone thresholds.

1.2 REFERENCES

A. Association Publications:
   1. American Architectural Manufacturers Association (AAMA:
      a. AAMA 609 & 609-09, 'Cleaning and Maintenance Guide for Architecturally Finished Aluminum' (combined document).
      b. AAMA 611-12, 'Voluntary Standards for Anodized Architectural Aluminum'.
      c. AAMA 701/702-11, 'Voluntary Specification for Pile Weatherstripping and Replaceable Fenestration Weatherseals'.
   2. National Association of Architectural Metal Manufacturers (NAAMM):
      a. AMP 500-06, 'Metal Finishes Manual' for Architectural and Metal Products.

B. Reference Standards:
   1. American National Standards Institute / Builders Hardware Manufacturers Association:
      a. ANSI / BHMA A156.18-2012, 'Materials and Finishes'.
      b. ANSI / BHMA A156.21-2014, 'American National Standard for Thresholds'.
   2. International Code Council / American National Standards Institute:
      a. ICC / ANSI A117.1-2009, 'Accessible and Usable Buildings and Facilities'.

PART 2 - PRODUCTS

2.1 MANUFACTURED UNITS

A. Manufacturers:
   1. Manufacturer Contact List:

B. Smoke Gaskets:
   1. Color as selected by Architect.
   2. Type One Acceptable Products:
      a. 726 by Hager.
      b. 5050 by NGP.
      c. PK 55 by Pemko.
      d. Equal as approved by Architect before bidding. See Section 01 6200.
      e. .
      f. Equal as approved by Architect before bidding. See Section 01 6200.

C. Thresholds:
   1. Type One Acceptable Products:
      a. Marble thresholds at toilet room doors.
         1) Meet handicap accessibility requirements (ADA):

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install smoke gaskets in manner to give continuous air-tight fit.
   1. Install smoke gaskets as per Manufacturer's installation requirements:
      a. Hinge Jamb: Install smoke gaskets on jamb face of door frame so door will compress smoke gasket.
      b. Header and Strike Jamb: Install smoke gaskets on face of stop of door frame so door will compress smoke gasket.
   2. Install acoustical seal with seal under door.

END OF SECTION

SECTION 09 2900

GYPSUM BOARD

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Furnish and install gypsum board on new 2 x 6 framed wall between new toilet room and clerks office. Install gypsum board on all walls in waiting area and one wall in Stake Presidents office on wall where existing door is filled in.
   2. Furnish and install acoustical sealants as described in Contract Documents.

B. Related Requirements:
   1. Section 09 3013: 'Ceramic Tile' for installation of backerboard joint reinforcing.
   2. Section 09 9413: 'Interior Textured Finishing'.

1.2 REFERENCES

A. Definitions:
   1. Accessories: Metal or plastic beads, trim, or moulding used to protect or conceal corners, edges, or abutments of the gypsum board construction.
   2. Drywall Primer: Paint material specifically formulated to fill the pores and equalize the suction difference between gypsum board surface paper and the compound used on finished joints, angles, fastener heads, and accessories and over skim coatings.
   3. Skim Coat: Either a thin coat of joint compound trowel applied, or a material manufactured especially for this purpose and applied in accordance with manufacturer's recommendations, over the entire surface.
   4. Texturing: Regular or irregular patterns typically produced by applying a mixture of joint compound and water, or proprietary texture materials including latex base texture paint, to a gypsum board surface previously coated with drywall primer.

B. Reference Standards:
   1. ASTM International:
      a. ASTM C11-18, 'Standard Terminology Relating to Gypsum and Related Building Materials and Systems'.
      b. ASTM C475/C475M-17, 'Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board'.
      c. ASTM C840-18a, 'Standard Specification for Application and Finishing of Gypsum Board'.
      d. ASTM C1002-18, 'Standard Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs'.
      e. ASTM C1047-14a, 'Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base'.
      f. ASTM C1178/C1178M-18, 'Standard Specification for Coated Glass Mat Water-Resistant Gypsum Backing Panel'.
      g. ASTM C1396/C1396M-17, 'Standard Specification for Gypsum Board'.
      h. ASTM E84-18b, 'Standard Test Method for Surface Burning Characteristics of Building Materials'.
      i. ASTM E413-16, 'Classification for Rating Sound Insulation'.
   2. Gypsum Association:
      a. GA-214-15, 'Recommended Levels of Gypsum Board Finish'.
      b. GA-216-16: 'Application and Finishing of Gypsum Panel Products'.
      c. GA-600-15, 'Fire Reference Design Manual'.

c. GA-600-15, 'Fire Reference Design Manual'.
d. GA-801-2017, 'Handling and Storage of Gypsum Panel Products: A Guide for Distributors, Retailers, and Contractors'.

3. International Building Code (IBC) (2018 or latest approved version):
   a. Chapter 25, 'Gypsum Board And Plaster'.
4. Standards Council of Canada / Underwriters Laboratories of Canada:
   a. CAN/ULC-S102:2018: 'Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies'.
5. Underwriters Laboratories, Inc.
   a. UL 263: 'Test Method for Fire Tests of Building Construction and Materials' (14th Edition).
   b. UL 723: 'Test for Surface Burning Characteristics of Building Materials; (11th Edition).

1.3 ADMINISTRATIVE REQUIREMENTS

A. Pre-Installation Conference:
   1. Schedule MANDATORY pre-installation conference immediately before installation of gypsum wallboard.
   2. In addition to agenda items specified in Section 01 3100, review following:
      a. Finish requirements necessary for installation of finish materials over gypsum wallboard, and location and installation of ceramic tile backerboard.

1.4 SUBMITTALS

A. Informational Submittals:
   1. Test And Evaluation Reports:
      a. Fire test results or assembly diagrams and numbers confirming products used will provide required fire ratings with installation configurations used.

1.5 DELIVERY, STORAGE, AND HANDLING

A. General:
   1. Following recommendations of GA-801 Guide for Handling and Storage of Gypsum Panel Products unless local, state or federal laws or agency rules differing from the recommendations shall take precedence.

B. Delivery And Acceptance Requirements:
   1. Deliver materials in original packages, containers, or bundles bearing brand name, applicable standard designation, and Manufacturer's name.

C. Storage And Handling Requirements:
   1. Store material under roof and keep dry and protected against damage from weather, condensation, direct sunlight, construction traffic, and other causes. Stack gypsum board flat to prevent sagging.

1.6 FIELD CONDITIONS

A. Ambient Conditions:
   1. Comply with ASTM C840 or GA-216 requirements, whichever are more stringent:
      a. Do not install interior products until installation areas are enclosed and conditioned.
         1) Temperature shall be 50 deg F (10 deg C) and 95 deg F (35 deg C) maximum day and night during entire joint operation and until execution of Certificate of Substantial Completion.
         2) Provide ventilation to eliminate excessive moisture.
         3) Avoid hot air drafts that will cause too rapid drying.

b. Do not install panels that are wet, those that are moisture damaged, and those that are mold damaged.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Manufacturers:
1. Manufacturer Contact List:
   a. American Gypsum, Dallas, TX www.americangypsum.com.
   b. CertainTeed Gypsum, Inc; Tampa, FL www.certainteed.com.
   c. Georgia Pacific, Atlanta, GA www.gp.com.
   d. National Gypsum, Charlotte, NC www.nationalgypsum.com.
   e. Pabco Gypsum, Newark, CA www.pabcogypsum.com.
   f. United States Gypsum Co, Chicago, IL www.usg.com.

B. Materials:
1. Interior Gypsum Board:
   a. General:
      1) Size:
         a) Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.
      2) Class Two Quality Standard:
         a) Core: Fire-resistant rated gypsum core.
         b) Complies with Type X requirements of ASTM C1396/C1396M (Section 5).
         c) Surface paper: Face paper suitable for painting.
         d) Long edges: Tapered edge.
         e) Overall thickness: 5/8 inch (15.9 mm).
2. Glass Mat Gypsum Tile Backer:
   a. Product meeting requirements of ASTM C1178/C1178M.
   b. Type X, 5/8 inch (15.9 mm).
   c. Square edges.
   d. Category Four Approved Manufacturer. See Section 01 6200 for definitions of Categories:
      1) DensShield Fireguard Type X by Georgia Pacific.
      2) GlasRoc Tilebacker Type X by CertainTeed.

2.2 ACCESSORIES

A. Manufacturers:
1. Manufacturer Contact List:
   a. Kinetics Noise Control, Dublin, OH www.kineticsnoise.com.
   b. Magnum Products, Lenaxa, KS www.levelcoat.com.
   c. National Gypsum, Charlotte, NC www.nationalgypsum.com.
   d. Soundproofing Co, San Marcos, CA www.soundproofing.org.
   e. United States Gypsum Co, Chicago, IL www.usg.com.
   f. Westpac Materials Inc, Orange, CA www.westpacmaterials.com.
   g. Wm. Zinsser & Co, Somerset, NJ www.zinsser.com.
      a) Ceilings: Galvanized DWFC-20.
   h. Control Joint:
      1) Bent zinc sheet with V-shaped slot, perforated flanges, covered with plastic tape meeting requirements of ASTM C1047.
2. Joint Compound:
   a. Best grade or type recommended by Board Manufacturer and meeting requirements of ASTM C475/C475M.
      1) Use Taping Compound for first coat to embed tape and accessories.

2) Use Taping Compound or All-Purpose Compound for subsequent coats except final coat.
3) Use Finishing Compound for final coat and for skim coat.

3. Joint Reinforcing:
   a. Paper reinforcing tape acceptable to Gypsum Board Manufacturer.
4. Fasteners:
   a. Bugle head screws meeting requirements of ASTM C1002:
      1) Gypsum Board:
         a) Type W: For fastening gypsum board to wood members, of length to penetrate wood framing 5/8 inch (15.9 mm) minimum.
         b) Type S: For fastening gypsum board to steel framing and ceiling suspension members, of length to penetrate steel framing 3/8 inch (9.5 mm) minimum.
      2) Glass Mat Gypsum Tile Backer:
         a) Wood Framing: 11 ga (0.1233 in) (3.1318 mm), galvanized with 7/16 inch (11 mm) head, hot dipped. Screws: Type W or Type S Hi-Lo, bugle head, rust resistant.
         b) Metal Framing:
            (1) Light-gauge metal framing: Type S Hi-Lo, bugle or wafer head, self-tapping, rust resistant. Hi-Lo screws.
            (2) Heavy-gauge metal framing: Type S-12 Hi-Lo, bugle or wafer head, rust resistant

B. Primer / Surfacer On Surfaces To Receive Texturing:
   1. Type Two Acceptable Products:
      a. Sheetrock First Coat by USG.
      b. Prep Coat by Westpac Materials.
      c. Level Coat by Magnum Products.
      d. Equal as approved by Architect before bidding. See Section 01 6200.

C. Primer On Surfaces To Receive Wallcovering:
   1. White, self-sizing, water based, all purpose wallcovering primer.
   2. Type Two Acceptable Products:
      a. Shieldz Universal Pre-Wallcovering Primer by Wm. Zinsser and Company.
      b. Equal as approved by Architect before application. See Section 01 6200.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification Of Conditions:
   1. Examine substrate and verify framing is suitable for installation of gypsum board.
   2. Examine gypsum board before installation. Reject panels that are wet, moisture damaged, and mold damaged.
   3. Notify Architect of unsuitable conditions in writing.
      a. Do not install board over unsuitable conditions.
   4. Commencement of Work by installer is considered acceptance of substrate.

3.2 INSTALLATION

A. Interface With Other Work:
   1. Coordinate with Division 06 for location of backblocking for edges and ends of gypsum board and for blocking required for installation of equipment and building specialties.
   2. Do not install gypsum board until required blocking is in place.

B. General: Install and finish as recommended in ASTM C840 or GA-216 unless specified otherwise in this Section.

C. Interior Gypsum Board:
   1. General:
      a. Install so trim and reinforcing tape are fully backed by gypsum board. No hollow spaces between pieces of gypsum board over 1/8 inch (3 mm) wide before taping are acceptable.
      b. Rout out backside of gypsum board to accommodate items that extend beyond face of framing, but do not penetrate face of gypsum board, such as metal door frame mounting brackets, etc.
      c. On walls over 108 inches (2 700 mm) high, apply board perpendicular to support
      d. Butt edges in moderate contact. Do not force in place. Shim to level.
      e. Leave facings true with joint, finishing flush. Vertical work shall be plumb and ceiling surfaces level.
      f. Scribe work closely:
         1) Keep joints as far from openings as possible.
         2) If joints occur near an opening, apply board so vertical joints are centered over openings.
         3) No vertical joints shall occur within 8 inches (200 mm) of external corners or openings.
      g. Install board tight against support with joints even and true. Tighten loose screws.
      h. Caulk perimeter joints in sound insulated rooms with specified acoustical sealant.
   2. Ceilings:
      a. Apply ceilings first using minimum of two (2) men.
      b. Use board of length to give minimum number of joints.
      c. Apply board perpendicular to support.
   3. Fastening:
      a. Apply from center of board towards ends and edges.
      b. Apply screws 3/8 inch (9.5 mm) minimum from ends and edges, one inch (25 mm) maximum from edges, and 1/2 inch (13 mm) maximum from ends.
      c. Spacing:
         1) Ends: Screws not over 7 inches (175 mm) on center at edges where blocking or framing occurs.
         2) Wood Framed Walls And Ceilings: Screws 7 inches (175 mm) on center in panel field.
         3) Metal Framed Walls: Screws 12 inches (300 mm) on center in panel field.
      d. Set screw heads 1/32 inch (0.8 mm) below plane of board, but do not break face paper. If face is accidentally broken, apply additional screw 2 inches (50 mm) away.
      e. Screws on adjacent ends or edges shall be opposite each other.
      f. Drive screws with shank perpendicular to face of board
   4. Trim:
      a. Corner Beads:
         1) Attach corner beads to outside corners.
            a) Attach metal corner bead with staples spaced 4 inches (100 mm) on center maximum and flat taped over edges of corner bead. Also, apply screw through edge of corner bead where wood trim will overlay corner bead.
            b) Set paper-faced trim in solid bed of taping compound.
      b. Edge Trim: Apply where gypsum board abuts dissimilar material. Hold channel and 'L' trim back from exterior window and door frames 1/8 inch (3 mm) to allow for caulking.
   5. Finishing:
      a. General:
         1) Tape and finish joints and corners throughout building as specified below to correspond with final finish material to be applied to gypsum board. When sanding, do not raise nap of gypsum board face paper or paper-faced trim.
         2) First Coat:
            a) Apply tape over center of joint in complete, uniform bed of specified taping compound and wipe with a joint knife leaving a thin coating of joint compound. If metal corner bead is used, apply reinforcing tape over flange of metal corner bead and trim so half of tape width is on flange and half is on gypsum board.
            b) Completely fill gouges, dents, and fastener dimples.
            c) Allow to dry and sand lightly if necessary, to eliminate high spots or excessive compound.
         3) Second Coat:

a) Apply coat of specified joint compound over embedded tape extending 3-1/2 inches (88 mm) on both sides of joint center. Use finishing compound only if applied coat is intended as final coat.
b) Re-coat gouges, dents, and fastener dimples.
c) Allow to dry and sand lightly to eliminate high spots or excessive compound.

4) Third Coat: Apply same as second coat except extend application 6 inches (150 mm) on both sides of joint center. Allow to dry and sand with fine sandpaper or wipe with damp sponge.
5) Fourth Coat: Apply same as second coat except extend application 9 inches (425 mm) on both sides of joint center. Allow to dry and sand with fine sandpaper or wipe with damp sponge.
6) Gypsum Board Surfaces to Receive: Painted Texturing - Section 09 9413: 'Interior Textured Finishing':
   a) GA-214 Level 4: 'All and interior angles shall have tape embedded in joint compound and two separate coats of joint compound applied over all flat joints and one separate coat of joint compound applied over interior angles. Fastener heads and accessories shall be covered with three separate coats of joint compound. All joint compound shall be smooth and free of tool marks and ridges. Coat prepared surface with specified primer'.

D. Glass Mat Gypsum Tile Backer:
   1. Apply glass mat gypsum tile backer to framing. Attach using specified fasteners spaced 6 inches (150 mm) on center on edges and into all framing members. Drive screws flush with surface of board.
   2. Shim board to be plumb and flat or level and flat, depending on location.
   3. Apply reinforcing only at joints where abutting different materials.

3.3 FIELD QUALITY CONTROL

A. Non-Conforming Work:
   1. Remove and replace panels that are wet, moisture damaged, and mold damaged.
      a. Indications that panels are wet, or moisture damaged include, but are not limited to, discoloration. sagging, or irregular shape.
      b. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

3.4 CLEANING

A. Remove from site debris resulting from work of this Section including taping compound spills.

END OF SECTION

SECTION 09 3013

CERAMIC TILING

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Furnish and install ceramic tile and tile setting materials and accessories as described in Contract Documents.

B. Related Requirements:
   1. Section 09 2900: 'Gypsum Board' for installation of backerboard behind ceramic tile, except for joint reinforcing.
   2. Section 22 1319: 'Facility Sanitary Sewer Specialties' for floor drains installed in ceramic tile floors.

C. Products Installed But not Furnished Under This Section:
   1. Interior Ceramic Tile Joint Sealants:

D. Related Requirements:
   1. Section 07 9213: 'Elastomeric Joint Sealants'.

1.2 REFERENCES

A. Association Publications:
   1. American National Standard Specification (ANSI) for the Installation of Ceramic Tile.
   2. International Standards Organization (ISO) 13007, 'Classification for Adhesives and Grout'.
   3. Tile Council of North America:
      a. TCNA Handbook, 'Handbook for Ceramic, Glass, and Stone Tile Installation, 2015'.

B. Definitions:
   1. Crack Isolation: Prevention of transfer of cracks from substrate through tile or stone when substrate is subjected to horizontal movement of cracks.
   2. Dynamic Coefficient of Friction (DCOF): Measures ratio of forces necessary to keep two surfaces sliding.
   3. Epoxy Grout: Mortar system employing epoxy resin and epoxy hardener portions.
   4. Grout: Rich or strong cementitious or chemically setting mix used for filling tile joints.
   5. ISO 13007 Standards Product Classifications:
      a. Adhesives:

Types	Classes	Special Characteristics
C = Cementitious (Thin-Set Mortars)	1 = Normal 2 = Improved	F = Fast-Setting T = Slip-Resistant E = Extended Open Time S1 = Deformable S2 = Highly Deformable P1 = Plywood Adhesion P2 = Improved Plywood Adhesion
D = Dispersion (Mastics)	1 = Normal 2 = Improved	F = Fast-Setting T = Slip-Resistant

		E = Extended Open Time
R = Reaction Resin (Epoxies)	1 = Normal 2 = Improved	T = Slip-Resistant

1) Cementitious Adhesive (C): Mixture of hydraulic binding agents (e.g. portland cement), aggregates, and organic additives (e.g. latex polymers, moisture retention additive, etc...) to be mixed with water or latex admix before mixing.
2) Dispersion Adhesive (D): Ready-to-use mixture of organic binding agents in the form of an aqueous polymer dispersion, organic additives and mineral fillers - mastic type products.
3) Reaction Resin Adhesive (R): Single or multi-component mixture of synthetic resin, mineral fillers and organic additives in which curing occurs by chemical reaction – epoxy or urethane based products.
4) Class 1 (1): Adhesive has passed minimum pass level tests that are mandatory for that adhesive type.
5) Class 2 (2): Adhesive has passed same tests as Class 1 and/or other applicable tests, but at higher pass levels.
6) Fast-Setting (F): Adhesive with accelerated cure time that must achieve minimum strength requirements of fast setting adhesive. This designation does not apply to reaction resin adhesives (R).
7) Slip-Resistance (T): Downward movement of a tile applied to combed adhesive layer on vertical surface must be ≤ 0.5mm for a C or D adhesive, and ≤ 5mm for a type R adhesive.
8) Extended Open Time (E): Maximum time interval after application at which tiles can be embedded in applied adhesive and meet tensile adhesion strength requirement must be ≥ 30 minutes. This designation does not apply to reaction resin adhesives (R).
9) Deformability (S): Capacity of hardened adhesive to be deformed by stresses between tile and substrate without damage to installed surface – to pass S1 requirements an adhesive must be able to deform ≥ 2.5mm but < 5mm; to pass S2 requirements an adhesive must be able to deform ≥ 5mm. This designation does not apply to reaction resin adhesives (R).
10) Exterior Glue Plywood (P): Adhesive with ability to bond tile or stone to exterior glue plywood substrates (interior only). This designation does not apply to reaction resin adhesives (R) or dispersion adhesives (D).

b. Grouts:

Types	Classes	Special Characteristics
CG = Cementitious Grout	1 = Normal 2 = Improved	F = Fast-Setting A = High Abrasion Resistance W = Reduced Water Absorption
RG = Reaction Resin Grouts	1 = Normal 2 = Improved	Higher performance characteristics than improved cementitious grouts

1) Cementitious Grout (CG): Mixture of hydraulic binding agents (e.g. portland cement), aggregates, inorganic and organic additives (e.g. latex polymers, moisture retention additive, etc...).
2) Reaction Resin Grout (RG): Single or multi-component mixture of synthetic resin, mineral fillers and organic additives in which curing occurs by chemical reaction – epoxy or urethane based products.
3) Class 1 (1): Grout has passed minimum pass level tests that are mandatory for cementitious grouts.
4) Class 2 (2): Cementitious grout has passed same tests as Class 1 and/or other applicable tests, but at higher pass levels.
5) Fast-Setting (F): Grout with accelerated cure time that must achieve minimum compressive strength requirements under normal conditions within twenty four (24) hours. This designation applies only to cementitious grouts (CG).

6) High Abrasion Resistance (A): Capability of grout to resist wear. This designation applies only to cementitious grouts (CG).
7) Reduced Water Absorption (W): Grout has lower water absorption rate than standard cementitious grout. This designation applies only to cementitious grouts (CG).

6. Latex/Polymer Modified Portland Cement Mortar: Latex/Polymer modified portland cement mortar is a mixture of portland cement, sand, and special latex/polymer additive that is used as a bond coat for setting tile.
7. Pavers: Unglazed porcelain or natural clay tile formed by dust-pressed method and similar to ceramic mosaics in composition and physical properties but relatively thicker with 6 inch - or more of facial area. (ASTM C242).
8. Sanded Cement Grout: Factory prepared mixture of cement, graded sand, and other ingredients to produce water-resistant, dense, uniformly colored material. Used for joints of 1/8 inch (3 mm) width or greater.
9. Static Coefficient of Friction (SCOF): Measures ratio of forces necessary to start two surfaces sliding (older measurement of friction replaced by dynamic coefficient of friction (DCOF)).
10. Unsanded Cement Grout: Factory prepared mixture of cement and additives that provide water retentivity. Used for joints of 1/8 inch (3 mm) or less.

C. Reference Standard:
1. American National Standards Institute:
   a. ANSI A108/A118/A136.1, 'American National Standards Specifications for the Installation of Ceramic Tile', Version 2013.1 (compilation of standards):
      1) Installation Standards:
         a) A108.01, 'General Requirements: Subsurfaces and Preparation by Other Trades'.
         b) A108.02, 'General Requirements: Materials, Environmental, and Workmanship'.
         c) A108.05, 'Installation of Ceramic Tile with Dry-Set Portland Cement Mortar of Latex-Portland Cement Mortar'.
         d) A108.6, 'Installation of Tile with Chemical Resistant, Water Cleanable Tile-Setting and Grouting Epoxy'.
         e) A108.10, 'Installation of Grout in Tilework'.
         f) A108.17, 'Installation of Crack Isolation Membranes for Thin-Set Ceramic Tile and Dimension Stone'.
      2) Material Specifications:
         a) A118.1, 'Dry-Set Portland Cement Mortar'.
         b) A118.3. 'Chemical Resistant, Water Cleanable Tile-Setting and -Grouting Epoxy and Water Cleanable Tile-Setting Epoxy Adhesive'.
         c) A118.4, 'Latex Portland Cement Mortar'.
         d) A118.6, 'Cement Grouts for Tile Installation'.
         e) A118.7, 'High-Performance Polymer Modified Latex/Portland Cement Grouts for Tile Installation'.
         f) A118.10, 'Load Bearing, Bonded, Waterproof Membranes for Thin-Set Ceramic Tile and Dimension Stone Installations'.
         g) A118.12, 'Crack Isolation Membranes for Thin-set Ceramic Tile and Dimension Stone Installations'.
   b. ANSI A137.1, 'National Standard Specifications for Ceramic Tile'.
2. ASTM International:
   a. ASTM A1064/A1064M-17, 'Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete'.
   b. ASTM C144-11, 'Standard Specification for Aggregate for Masonry Mortar'.
   c. ASTM C150/C150M-17, 'Standard Specification for Portland Cement'.
   d. ASTM C206-14, 'Standard Specification for Finishing Hydrated Lime'.
   e. ASTM C207-06(2011), 'Standard Specification for Hydrated Lime for Masonry Purposes'.
   f. ASTM C242-15, 'Standard Terminology of Ceramic Whitewares and Related Products'.
   g. ASTM C373-16, 'Standard Test Method for Water Absorption, Bulk Density, Apparent Porosity, and Apparent Specific Gravity of Fired Whiteware Products'.
   h. ASTM C482--02(2014), 'Standard Test Method for Bond Strength of Ceramic Tile to Portland Cement Paste'.
   i. ASTM C501-84(2015), 'Standard Test Method for Relative Resistance to Wear of Unglazed Ceramic Tile by the Taber Abraser'.
   j. ASTM C648-04(2014), 'Standard Test Method for Breaking Strength of Ceramic Tile'.

k. ASTM C847-14a, 'Standard Specification for Metal Lath'.

3. International Organization for Standardization:
   a. ISO 13007-1-2013, ' Ceramic tiles - Grouts and adhesives - Part 1: Terms, definitions and specifications for adhesives'.
   b. ISO 13007-2-2013, ' Ceramic tiles - Grouts and adhesives - Part 2: Test methods for adhesives'.
   c. ISO 13007-3-2013, ' Ceramic tiles - Grouts and adhesives - Part 3: Terms, definitions and specifications for grouts'.
   d. ISO 13007-4-2013, ' Ceramic tiles - Grouts and adhesives - Part 4: Test methods for grouts'.
4. Tile Council of North America:
   a. TCNA F141-15, 'Joists 16 inch o.c./Plywood Subfloor, Unbonded Mortar Bed, Ceramic Tile'. TCNA F144-15, 'Joists 16 inch o.c./Plywood, Subfloor, Cement or Giber-Cement, Backer Board, Ceramic Tile'.
   b. TCNA W245-15, 'Wood or Metal Studs, Coated Glass Mat Water-Resistant Gypsum Backer Board, Ceramic Tile'.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Pre-Installation Conference:
   1. In addition to agenda items specified in Section 01 3100, review following:
      a. Review installation scheduling, coordination with related work, and placement of tile.
      b. Review Manufacturer's installation requirements, submittals, and Installers requirements to assure issuance of Manufacturer's system warranty.
      c. Review surface preparation.
      d. Review water-proofing and crack isolation membrane requirements.
      e. Review tile base installation requirements.
      f. Review floor tile grout thickness requirements.

1.4 SUBMITTALS

A. Action Submittals:
   1. Samples:

B. Informational Submittals:
   1. Certificates:
      a. Master grade certificate.
         1) Conform to ANSI A137.1.
   2. Manufacturer's Instructions:
      a. Provide instructions for installation of tile-setting materials.
   3. Source Quality Control Submittals:
      a. Provide Manufacturer documentation indicating proposed materials will satisfy requirements for Manufacturer's Warranty.
   4. Qualification Statement. See Section 01 4301 for qualifications:
      a. Installer:
         1) Provide Qualification documentation if requested by Architect or Owner.

C. Closeout Submittals:
   1. Include following in Operations And Maintenance Manual specified in Section 01 7800:
      a. Operations and Maintenance Data:
         1) Cleaning and maintenance instructions.
      b. Warranty Documentation:
         1) Include copy of final, executed warranty.
      c. Record Documentation:
         1) Manufacturers Documentation:
            a) Source Quality Control Submittal documentation showing materials will satisfy requirements for Manufacturer's Warranty.
            b) Manufacturer's cut sheets of materials used in installed system.

c) Tile color and pattern selections.

1.5 QUALITY ASSURANCE

A. Source Of Materials:
   1. Provide materials obtained from one (1) source for each type and color of tile, grout, and setting materials for Manufacture's system warranty.

B. Qualifications:
   1. Installer: Requirements of Section 01 4301 applies, but not limited to following:
      a. Minimum three (3) years' experience installing specified tile installations.
      b. Minimum five (5) satisfactorily completed installations of comparable quality, scope, similar size, and complexity in past two (2) years before bidding.
      c. Upon request, submit documentation.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Delivery And Acceptance Requirements:
   1. Deliver and store packaged materials in their original unopened containers with labels intact until time of use.

B. Storage and Handling Requirements:
   1. Store and handle materials in a manner to prevent damage or contamination by water, freezing, or foreign matter.
   2. Keep grade seals intact and cartons dry until tile are used.

1.7 FIELD CONDITIONS

A. Ambient Conditions:
   1. Do not apply tile setting materials to surfaces that contain frost.
   2. Keep ambient temperatures of area to receive tile work and surface temperatures of substrates at 50 deg F (10 deg C) minimum during preparation of mortar bed, laying of tile, and for seventy-two (72) hours after completion of tile work. Use electric heat to prevent discoloration of grout.
   3. Temperature of substrate shall be 60 deg F (15.6 deg C) and rising for application of epoxy and furan unless otherwise specifically authorized by Manufacturer.
   4. Maintain epoxy at stable temperature between 60 deg F (15.6 deg C) and 90 deg F (32 deg C) during curing period.

1.8 WARRANTY

A. Manufacturer Warranty:
   1. Mortar Manufacturer's twenty-five (25) year minimum system warranty on tile-setting materials for surface preparation, setting materials and grouting materials; includes replacement of defective materials and deterioration, including replacement of tile and labor and materials when products purchased are used within their shelf life and installed in accordance to Manufacturers written instructions and industry standard guidelines.

PART 2 - PRODUCTS

2.1 SYSTEMS

A. Manufacturers:
   1. Manufacturer's Contact List:

a. Ardex Engineered Cements, Aliquippa, PA www.ArdexAmericas.com.
   1) Contact Information: Don Richards (206) 979-0401 www.Don.richards@ArdexAmericas.com.
b. Custom Building Products, Seal Beach, CA www.custombuildingproducts.com.
   1) Contact Information: John Gallup (206) 718-6024 johng@cbpmail.net.
c. Dal-Tile Corp., Div. of Mohawk Industries, Dallas, TX www.daltile.com.
d. Interceramic Inc., Garland, TX www.interceramic.com.
e. Laticrete International Inc., Bethany, CT www.laticrete.com.
f. Mapei Americas Headquarters, Deerfield Beach, FL www.mapei.com.
   1) Contact Information: Bart A. Wilde (801) 467-2060 www.bwilde@mapei.com.
g. Merkrete, by Parex USA, Inc., Anaheim, CA www.merkrete.com.
   1) Contact Information: Andy Townes (505) 873-1181 andy.townes@parexusa.com.
h. Schulter Systems L.P., Plattsburgh, NY www.schluter.com.

B. Category Two National Contract Suppliers. See Section 01 6200 for definitions of Categories:
1. Contact following suppliers to procure components of tile assembly:
   a. Daltile And Stone, Salt Lake City, UT:
      1) LDS Project Coordinators:
         a) Russ Green and Larry McCleary, (801) 487-9901, cell (801) 301 1461, fax (801) 487-0345 larry.mccleary@daltile.com - www.daltileproducts.com or www.daltilegreenworks.com.
   b. Interceramic:
      1) LDS Project Coordinators:
         a) First Contact: Diego Chavez, phone (214) 503-5433, fax (877) 551-1979 dichavez@interceramic.com.
         b) Second Contact: Jose Valdez, phone (214) 503-5507, fax (877) 551-1979 jvaldez@interceramic.com.

C. Design Criteria:
1. General:
   a. Paver Tile: Standard grade porcelain tile, solid color throughout, graded in accordance with ANSI A137.1:
      1) Cove Base with external and internal corner pieces shall be standard grade.
   b. Ceramic Tile:
      1) Tile shall be standard quality, white or off-white body, square or cushion edge, graded in accordance with ANSI A137.1.
      2) Square edge, white body, lug type wall tile. Field wall tile shall have two lugs on each edge to assure uniform joint, approximately 0.040 inch (one mm).
      3) External and internal corner pieces shall be standard grade.

D. Description:
1. Paver Tile:
   a. Tile Sizes:
      1) Finished floor with slope shown on Contract Documents: 8 inches (200 mm) square:
         a) Cove Base: External and internal corner pieces to match with bull-nosed top:
            (1) 6 inches by 8 inches (150 mm by 200 mm) with bull-nosed top.
         b) Category Four Approved Products. See Section 01 6200 for definitions of Categories:
            (1) Daltile.
   b. Category Four Approved Colors. See Section 01 6200 for definitions of Categories:
      1) CD05 Bianco Alpi by Daltile.
      2) Dotti Ivory by Interceramic.
2. Ceramic Tile:
      1) Walls: 4-1/4 inches by 4-1/4 inches (108 mm by 108 mm).
      2) Ceramic Tile Base:
         a) 4-1/4 inch (108 mm) high, A4402 bullnose base.
      3) Walls: 4-1/4 inches by 4-1/4 inches (108 mm by 108 mm).
         a) Room Walls:
            (1) 0100 White by Daltile.
            (2) Bone by Interceramic.

b) Accent Color:
(1) 0135 Almond by Daltile.
(2) Canvas by Interceramic.

E. Materials:
1. Paver Tile:
a. Category Four Approved Products. See Section 01 6200 for definition of Categories:
1) Porcealto Graniti by Daltile.
2) Intertech Unglazed by Interceramic.
2. Wall Tile:
a. Category Four Approved Products. See Section 01 6200 for definition of Categories:
1) Semi-Gloss or Matte by Dal-Tile.
2) IC Brites or Mattes or Bold Tones Series by Interceramics.
3. Mortar Bed:
a. Portland Cement: Meet requirements of ASTM C150/C150M, Type 1, designation shall appear on bag.
b. Hydrated Lime:
1) Meet Requirements of one of following:
a) ASTM C206.
b) ASTM C207, Type S (designation shall appear on bag).
c. Sand: Clean, washed, well-graded, meeting requirements of ASTM C144 with gradation of 100 percent passing No. 8 sieve with not over five (5) percent passing No. 100 sieve.
d. Latex Additive; in lieu of all water:
1) Design Criteria:
a) Meet material specification requirements of ANSI A118.4 or ANSI 118.11.
b) Meet ANSI installation specification requirements of ANSI A108.5.
c) Expansion joints complies with TCA method EJ171.
2) Type Two Acceptable Products:
a) ARDEX: Ardex E 90 Mortar Admix.
b) CUSTOM: Thin-Set Mortar Admix.
c) LATICRETE: 4237 Latex Additive with 211 Powder.
d) MAPEI: Planicrete AC.
e) MERKRETE: 150 Latex Admixture.
4. Metal Trim:
a. Category Four Approved Products. See Section 01 6200 for definitions of Categories:
1) Tile / Carpet Junction: Schluter-RENO-AETK.
b. Floor Grout (Epoxy):
1) Design Criteria:
a) Meet ANSI material specification requirements of ANSI 118.3.
b) Meet ANSI installation specification requirements of ANSI A108.6 and ISO material specification ISO13007 RG.
2) Approved Color:
a) ARDEX: 25 Stormy Mist.
b) CUSTOM: No. 145 Light Smoke.
c) LATICRETE: No. 24 Natural Grey.
d) MAPEI: No. 11 Sahara Beige.
e) MERKRETE: Pro Epoxy D-153 Buckskin.
3) Category Four Approved Products. See Section 01 6200 for definitions of Categories:
a) ARDEX: Ardex WA.
b) CUSTOM: CEG-Lite 100% Solids Commercial Epoxy Grout.
c) LATICRETE: SpectraLOCK PRO.
d) MAPEI: Kerapoxy (sanded).
e) MERKRETE: Pro Epoxy.
c. Wall Grout (Modified Polymer):
1) Design Criteria:
a) Meet ANSI material specification requirements of ANSI A118.6 or ANSI A118.7.
b) Meet ANSI installation specification requirements of ANSI 108.10 or ISO material specification ISO13007 C2ES1P2.
2) Color:
a) ARDEX: No. 01 Polar White.

b) CUSTOM: No. 381 Bright White.
c) LATICRETE: No. 44 Bright White.
d) MAPEI: No. 00 White.
e) MERKRETE: D-11 Snow White.

3) Category Four Approved Products. See Section 01 6200 for definitions of Categories:
a) ARDEX: Ardex FH.
b) CUSTOM: PolyBlend Non-Sanded Grout or Prism Color Consistent Grout.
c) LATICRETE: 1600 Series Unsanded Dry Set Wall Grout with 1776 Grout Admix Plus additive.
d) MAPEI: Keracolor-U Unsanded Polymer-Modified Grout.
e) MERKRETE: Non-Sanded ColorGrout, latex modified.

d. Waterproofing Membrane:
1) Design Criteria:
a) Meet ANSI installation specification requirements of ANSI 108.10.
b) ANSI installation specification requirements not required.
2) Category Four Approved Products. See Section 01 6200 for definitions for Categories:
a) Troweled applied, cement based:
(1) ARDEX: Ardex 8+9.
(2) MAPEI: Mapelastic 315.
b) Liquid applied, latex based:
(1) CUSTOM: RedGard Waterproofing or Crack Prevention Membrane or FractureFree Crack Prevention Membrane.
(2) LATICRETE: Hydro Ban.
(3) MAPEI: Mapelastic AquaDefense
(4) MERKRETE: Hydro-Guard SP-1.

e. Crack Isolation Membrane:
1) Design Criteria:
a) Meet ANSI installation specification requirements of ANSI 118.12.
b) ANSI installation specification requirements not required.
2) Category Four Approved Products. See Section 01 6200 for definitions for Categories:
a) Flexible, thin, load-bearing, fabric-reinforced:
(1) ARDEX: Ardex 8+9 with SK Mesh Tape.
(2) CUSTOM: Crack Buster Pro Crack Prevention Mat Underlayment, with Peel & Stick Primer.
(3) LATICRETE: Blue 92 Anti-Fracture Membrane.
(4) MAPEI: Mapeguard 2, and Primer SM.
(5) MERKRETE: Hydro-Guard SP-1.
b) Liquid applied, latex based:
(1) CUSTOM: RedGard Waterproofing and Crack Prevention Membrane or FractureFree Crack Prevention Membrane.
(2) LATICRETE: Hydro Ban.
(3) MAPEI: Mapelastic AquaDefense.
(4) MERKRETE: Fracture Guard 5000.

f. Stone Thresholds:
1) Texture and color variation shall be within limits established by Architect's approved sample.
2) Free of defects that would materially impair strength, durability, and appearance.
3) Finish: 80 grit exterior hone.
4) White marble, one (1) piece, 7/8 inch (22 mm) thick by 2 1/2 inches (64 mm) by door opening width. Cross-section to meet handicap accessibility requirements.

F. Mixes:
1. Mortar Beds:

	Portland Cement	Dry Sand	Damp Sand	Hydrated Lime*
Floor Mix	One Part	5 Parts	4 Part	1/10 Part
Wall Mix	One Part	--	5-1/2 to 7 Parts	1/2 Part
				--
				--

INSTALLERS

G. Acceptable Installers:
   1. Meet Quality Assurance Installer Qualifications as specified in Part 1 of this specification.

2.2 EXAMINATION

A. Verification Of Conditions:
   1. Examine substrates where tile will be installed for compliance with requirements for installation tolerances and other conditions effecting performance of installed tile.
   2. Verify tile substrate is well cured, dry, clean, and free from oil or waxy films, and curing compounds.
   3. Notify Architect in writing if surfaces are not acceptable to install tile:
      a. Do not lay tile over unsuitable surface.
      b. Commencing installation constitutes acceptance of surfaces and approval of existing conditions.

2.3 PREPARATION

A. Surface Preparation:
   1. Allow concrete to cure for twenty-eight (28) days minimum before application of mortar bed.
   2. Repair and clean substrate in accordance with installation standards and manufacturer's instructions.

2.4 INSTALLATION

A. Interface With Other Work:
   1. Grounds, anchors, plugs, hangers, door frames, electrical, mechanical, and other work in or behind tile shall be installed before tile work is started.

B. Special Techniques:
   1. Install in accordance with following latest TCNA installation methods:
      a. Flush Concrete Slabs with crack isolation membrane: TCNA F115.
      b. Mortar Bed on Concrete Slab: TCNA F111 with reinforcing.
      c. Framed Floors: TCNA F141 or F144 at installer's option.

C. Tolerances:
   1. Plane of Vertical Surfaces.
      a. 1/8 inch in 8 feet (3 mm in 2.450 meters) from required plane shall be plumb and true with square corners.
   2. Variation In Slab Grade:
      a. Plus or minus 1/8 inch (3 mm) in any 10 feet (3.050 m) of floor slab and distance between high point and low point of slab of 1/2 inch (12.7 mm).
      b. Slab Testing Procedure:
         1) Place ends of straightedge on 3/8 inch (10 mm) high shims.
         2) Floor is satisfactory if 1/4 inch (6 mm) diameter steel rod rolled under straightedge will not touch anywhere along 10 foot (3.050 m) length and 1/2 inch (12.7 mm) diameter steel rod will not fit under straightedge anywhere along 10 foot (3.050 m) length.

D. General:
   1. Install tile in pattern indicated:
      a. Align joints when adjoining tiles on floor, base, walls, and trim are same size.
      b. Adjust to minimize tile cutting and to avoid tile less than half size.
      c. Center and balance areas of tile if possible.
   2. Extend tile into recesses and under equipment and fixtures to form a complete covering without interruption:

3. Maintain heights of tilework in full courses to nearest obtainable dimension where heights are given in feet and inches (meters and millimeters) and are not required to fill vertical spaces exactly.
4. Install cut tile with cuts on outer edges of field:
   a. Provide straight cuts that align with adjacent materials.
   b. When possible, smooth cut edges of tile or use appropriate cutter or wet saw to produce smooth cuts.
   c. Do not install tile with jagged or flaked edges.
5. Terminate tile neatly at obstructions, edges, and corners, without disruption of pattern or joint alignment:
   a. Fit tile closely where edges are to be covered by trim, escutcheons, or similar devices.
6. Provide straight tile joints of uniform width, subject to variance in tolerance allowed in tile size:
   a. Make joints smooth and even, without voids, cracks, or excess mortar or grout.
7. Use a beating block and hammer or rubber mallet so faces and edges of individual tiles are flush and level with faces and edges of adjacent tiles, and to reduce lippage.
8. Accessories in tilework shall be evenly spaced, properly centered with tile joints, and level, plumb, and true to correct projection.
9. Leave finished installation clean and free of cracked, chipped, broken, unbonded, and otherwise defective tile work.

E. Application On Framed Floors:
   1. On Cement Board Sheathing:
      a. Install cement board in accordance with Manufacturer's recommendations.
      b. Attach board through subfloor into framing with screws spaced 8 inches (200 mm) on center. Pre-drill holes in cement board for screws if required by Cement Board Manufacturer.
      c. Provide bedding coat, tape and fill joints as required by Cement Board Manufacturer.

F. Application On Concrete Floor:
   1. On Mortar Bed:
      a. Apply mortar bed to depth equal to depression in slab minus 1/2 inch (12.7 mm).
      b. Properly cure before installing tile.
   2. Clean substrate surface thoroughly.
      a. Dampen if very dry, but do not saturate.
   3. Install tile with 100 percent contact with mortar bed.
      a. Obtaining 100 percent contact may require troweling mortar layer on back of each tile before placing on mortar bed.
   4. Install base by flush method (square or thin-lip method is not acceptable):
      a. Allow for expansion joint directly above any expansion or control joints in slab.
   5. Insert temporary filler in expansion joints.
   6. Keep installation at 65 to 85 deg F (18 to 30 deg C) during first eight (8) hours of cure. Shade area completely from sun during this period.

G. Application of Joint Sealants:
   1. Apply joint sealants after grout has cured:
      a. This requires forty-eight (48) hours minimum.
   2. Before applying sealant:
      a. Remove spacers or ropes before applying joint sealants.
      b. Apply backer rod and joint sealants at expansion joints.

2.5 FIELD QUALITY CONTROL

A. Non-Conforming Work:
   1. Correct any work found cracked, chipped, broken, unbounded and otherwise defective or not complying with contract document requirements at no additional cost to the Owner.

2.6 CLEANING

A. If one has been used, remove grout release and clean tile surfaces so they are free of grout residue and foreign matter.
   1. If a grout haze or residue remains, use a suitable grout haze remover or cleaner.
   2. Flush surface with clean water before and after cleaning.

2.7 PROTECTION

A. Close to traffic areas where tile is being set and other tile work being done:
   1. Keep closed until tile is firmly set.
   2. Before, during, and after grouting, keep area clean, dry, and free from foreign materials and airflow that will interfere with setting and curing of grout.

B. Newly tiled floors shall not be walked on nor worked on without using kneeling boards or equivalent protection of tiled surface.

C. After cleaning, provide protective covering and maintain conditions protecting tile work from damage and deterioration:
   1. Where tiled surfaces will be subject to equipment or wheel traffic or heavy construction traffic, cover protective covering with 1/4 inch (6 mm) hardboard, plywood, or similar material.

END OF SECTION

SECTION 09 5116

ACOUSTICAL TILE CEILINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Furnish and install acoustical tile on new gypsum backerboard in new waiting area and clerks office.

B. Related Requirements:
   1. Section 09 2900: 'Gypsum Board'.
   2. Section 09 5116: 'Interior Lighting'.

1.2 REFERENCES

A. Association Publications:
   1. The Ceilings & Interior Systems Construction Association (CISCA), 405 Illinois Avenue, 2B, St Charles IL. www.cisca.org.
      a. *'Ceiling Systems Handbook'*: Recommendations for direct hung acoustical tile installation.
      b. *'Production Guide'*: Practical reference for ceiling systems and estimating costs.

B. Definitions:
   1. Absorption: Materials that have capacity to absorb sound. Absorption is the opposite of reflection.
   2. Ceiling Attenuation Class (CAC): Rates ceiling's efficiency as barrier to airborne sound transmission between adjacent closed offices. Shown as minimum value, previously expressed as CSTC (Ceiling Sound Transmission Class). Single-figure rating derived from normalized ceiling attenuation values in accordance with classification ASTM E413, except that resultant rating shall be designated ceiling attenuation class. (Defined in ASTM E1414.) Acoustical unit with high CAC may have low NRC.
   3. Class A: Fire classification for product with flame spread rating of no more than 25 and smoke developed rating not exceeding 50, when tested in accordance with ASTM E84 or UL 723.
   4. Flame Spread Index: Comparative measure, expressed as a dimensionless number, derived from visual measurements of the spread of flame versus time for a material tested in accordance with ASTM E84 or UL 723.
   5. Smoke-Developed Index: Comparative measure, expressed as a dimensionless number, derived from visual measurements of smoke obscuration versus time for a material tested in accordance with ASTM E84 or UL 723.
   6. Surface Burning Characteristic: Rating of interior and surface finish material providing indexes for flame spread and smoke developed, based on testing conducted according to ASTM Standard E84 or UL 723.
   7. .

C. Reference Standards:
   1. American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (AASHRA):
      a. ASHRAE Standard 62.1-2013, 'Ventilation for Acceptable Indoor Air Quality'.
   2. ASTM International,
      a. ASTM D1779-98(2017), 'Standard Specification for Adhesive for Acoustical Materials'.
      b. ASTM E84-18b, 'Standard Test Method for Surface Burning Characteristics of Building Materials'.
      c. ASTM E795-16, 'Standard Practices for Mounting Test Specimens During Sound Absorption Tests'.
      d. ASTM E1264-14, 'Standard Classification for Acoustical Ceiling Products'.

e. ASTM E1414/E1414-16, 'Standard Test Method for Airborne Sound Attenuation Between Rooms Sharing a Common Ceiling Plenum'.
f. ASTM E1477 - 98a(2017), 'Standard Test Method for Luminous Reflectance Factor of Acoustical Materials by Use of Integrating-Sphere Reflectometers'.

3. International Building Code (IBC) (2018 or latest approved Edition:
   a. Chapter 8, 'Interior Finishes':
      1) Section 803, 'Wall And Ceiling Finishes':
         a) 803.1.1, 'Interior Wall and Ceiling Finish Materials'.
         b) 803.1.2, 'Room Corner Test for Interior Wall or Ceiling Finish Materials'.
4. National Fire Protection Association:
   a. NFPA 101: 'Life Safety Code' (2018 Edition).
   b. NFPA 265: 'Standard Methods of Fire Tests for Evaluating Room Fire Growth Contribution of Textile Coverings on Full Height Panels and Walls' (2015 Edition).
5. Underwriters Laboratories Inc.:
   a. UL 723, 'Standard for Safety Test for Surface Burning Characteristics of Building Materials' (Tenth Edition).

1.3 ADMINISTRATIVE REQUIREMENTS

A. Pre-Installation Conferences:
   1. Participate in pre-installation conference specified in Section 09 2900 to review finish requirements for gypsum wallboard ceilings.
   2. Schedule acoustical tile ceiling pre-installation conference after installation of gypsum wallboard but before beginning installation of tile.
   3. In addition to items specified in Section 01 3100, review following:
      a. Verify that tile comes from same dye lot and has same dye lot code.
      b. Review requirements of acceptable and non-acceptable tile.

1.4 SUBMITTALS

A. Action Submittals:
   1. Samples:
      a. One (1) sample of each variant of specified tile series.

B. Informational Submittals:
   1. Certificates:
      a. Installer(s):
         1) Provide each Installer's 'Certificate of Completion - Duratile' from Manufacture showing Name and completion date with bid to be included in closing documents for project.
            a) Certificate is valid for two (2) years from date printed on Certificate before recertification is required.
   2. Test And Evaluation Reports:
      a. If requested by Owner, provide copies of Quality Assurance requirements for 'Class A' flame spread rating and 'Room-Corner Test'.
   3. Manufacturer Installations:
      a. Published installation recommendations.
   4. Qualification Statement:
      a. Installer(s):
         1) Provide Qualification documentation unless waived by Owner.

C. Closeout Submittals:
   1. Include following in Operations And Maintenance Manual specified in Section 01 7800:
      a. Warranty Documentation:
         1) Include final, executed copy of warranty.
      b. Record Documentation:
         1) Manufacturers Documentation:
            a) Manufacturer's literature on tile and adhesive.

b) Color and pattern selection.
2) Installer(s) 'Certificate of Completion - Duratile' submitted at time of bid.

D. Maintenance Material Submittals:
1. Extra Stock Materials:
a. Provide Owner with six (6) cartons of each type of tile with same dye lot code.

1.5 QUALITY ASSURANCE

A. Regulatory Agency Sustainability Approvals:
1. Fire-Test-Response Characteristics: As determined by testing identical ceiling tile applied with identical adhesives to substrates according to test method indicated below by qualified testing agency. Identify products with appropriate markings of applicable testing agency.
a. Surface-Burning Characteristics:
1) Ceiling tile shall have Class A flame spread rating in accordance with ASTM E84 or UL 723 Type 1.
a) Class A (Flame spread index 0-25; Smoke-developed index 0-450).
b) Flash point: None.
2) ASTM E84, 'Standard Test Method for Surface Burning Characteristics of Building Materials'.
3) UL 723, 'Standard for Safety Test for Surface Burning Characteristics of Building Materials'.

B. Qualifications:
1. Installer: Requirements of Section 01 4301 applies, but not limited to following:
a. Minimum five (5) years satisfactorily completed projects of comparable quality, similar size, and complexity including a minimum of three (3) years of experience in glue-up ceiling tile installations and shall have satisfactorily completed glue-up installation(s) within in past three (3) years before bidding.
b. Review, understand, and comply Installer Qualifications and submitted 'Duratile' published installation recommendations provided by Manufacturer:
1) Contact Armstrong CSA customer service center at (800) 442-4212 to obtain and review compliance package on Duratile prior to bidding.
2) This requirement may be waived by Owner, if Installer has previously complied with Installer Qualification requirements and can document at least two (2) satisfactorily completed projects of comparable size using Armstrong 12 inch x 12 inch (300 mm x 300 mm) ceiling tile for glue-up within past three (3) years prior to bidding.
3) Installer shall note complete compliance with Qualification requirements on submitted bid form.
4) Submit qualification documentation unless waived by Owner.
c. Agree to complete and pass 'Duratile Personal Learning Module' (Certificate required for all Installer(s) for Church projects). Certification valid for two (2) years:
1) Go to http://www.armstrong.com/commceilingsna/#.
2) Click on My Armstrong Upper Right hand Corner.
3) First time users: Click on 'Register' button and provide all appropriate information for username and password (you must register as a contractor to have access to 'ELearning System).
4) Under My Armstrong Functions (left hand side), click on 'ELearning System'.
5) Click on 'Duratile Video'.
6) Watch video and take Quiz (10 questions). Passing grade required for certificate.
7) Print Certificate.
8) Certificate must be submitted with Bid.
9) Submit 'Certificate of Completion - Duratile'. Required for all projects and may not be waived by Owner.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Delivery and Acceptance Requirements:
   1. Materials shall be delivered in original, unopened packages with labels intact.

B. Storage And Handling Requirements:
   1. Store materials where protected from moisture, direct sunlight, surface contamination, and damage.
   2. Store acoustic tile in cool, dry location, out of direct sunlight and weather, and at temperatures between 32 deg F (0 deg C) and 86 deg F (30 deg C).
   3. Store adhesive on site at installation temperature, between 65 and 90 deg F (18 and 32 deg C), for one week before installation.
   4. Handle acoustical ceiling tiles carefully to avoid chipping edges or damage. Use no soiled, scratched, or broken material in the Work.

1.7 FIELD CONDITIONS

A. Ambient Conditions:
   1. Building shall be enclosed, mechanical system operating with proper filters in place, and temperature and humidity conditions stabilized within limits under which Project will operate before, during, and after installation until Substantial Completion.
   2. Temperature at time of setting tile shall be 50 deg F (10 deg C) minimum and 100 deg F (38 deg C) maximum.

1.8 WARRANTY

A. Manufacturer Warranty:
   1. Provide Manufacturer's ten (10) year limited system warranty for the following:
      a. Manufacturer's warranty to be free from defects in materials and factory workmanship.
      b. Manufacturer's warranty against sagging and warping.
      c. Manufacturer's warranty against mold/mildew, and bacterial growth.

PART 2 - PRODUCTS

2.1 SYSTEM

A. Manufacturers:
   1. Manufacturer Contact List:
      a. Armstrong World Industries, Strategic Accounts, Lancaster, PA www.ceilings.com.
         1) For pricing and ordering of tile, contact Sherry Brunt, Phyllis Miller, or Beth Rinehart at (800) 442-4212, or Armstrongcsa@armstrong.com.
         2) For Strategic Account information, contact Deborah Pickens at (480) 695-9053 dlpickens@armstrong.com.
      b. Franklin International, Inc., Columbus, OH www.titebond.com.

B. Materials:
   1. Description:
      a. Size: 3/4 inch (19 mm) thick minimum by 12 inches (300 mm) square.
      b. Color: White.
      c. Grid Face: Tile glue-up.
      d. Surface Finish: Factory-applied.
      e. Wet-formed high density mineral fiber.
   2. Design Criteria:
      a. Meet requirements of ASTM E1264, Type III (mineral base with painted finish), Form 2 (water felted), Pattern CE (perforated, small holes – lightly textured), Fire Class A.

b. Acoustics:
   1) Noise Reduction Coefficient (Rating expressed according to ASTM E1284 requirements:
      a) NRC rating: 60 minimum.
   2) CAC rating: 35 minimum.
c. Anti Mold / Mildew:
   1) Resistance against growth of mold/mildew.
d. Durable:
   1) Impact-resistant.
   2) Scratch-resistant.
e. Tongue and Groove.
f. Finish:
   1) Abuse-resistant/durable, factory applied vinyl latex paint.
g. Fire Performance:

C. Accessories:
1. Adhesive:
   a. Description:
      1) For use on acoustical ceiling tiles.
   b. Design Criteria:
      1) Meet requirements of ASTM D1779.
      2) Meet NFPA Class A fire rating when tested in accordance with ASTM E84.
      3) Fast grab and 'no sag' installation.
      4) Water cleanup.
      5) Not recommended for use on tiles larger than 12 inch x 12 inch (305 mm x 305 mm).
   c. Type Two Acceptable Products:
      1) Titebond No. 2704 Solvent Free Acoustical Ceiling Tile Adhesive by Franklin International.
      2) Highest quality of adhesive from manufacturer recommended by Tile Manufacturer as approved by Architect before use. See Section 01 6200.
2. Edge Molding:
   a. Steel 'U' molding with baked enamel finish.
   b. Type Two Acceptable Products:
      1) 7843 Series by Armstrong.
      2) Equal as approved by Architect before installation. See Section 01 6200.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification Of Conditions:
1. Inspect for defects in backing and support that are not acceptable.
   a. Examine areas around HVAC diffusers and light fixtures for tile installation problems.
   b. Examine ceiling for levelness. CISCA *'Code of Practice'* requires ceiling to be free of irregularities and be level to within 1/4 inch (6 mm) in 12 foot (305 mm).
   c. Examine substrate for any problems that will compromise adhesion of ceiling tile.
2. Notify Architect in writing of unacceptable conditions.
3. Do not apply ceiling tile until defects in backing and support are corrected.

3.2 PREPARATION

A. Surface Preparation:
1. Follow Manufacturer recommendations for surface preparation:
   a. Substrate must be clean, free of grease and dirt, sound, smooth, even and level before applying tile to surface.

1) Do not install new ceiling tile over old glue globs or bad substrate with any surface finish that is incompatible with tile adhesive.

b. Painted Surfaces: Avoid applying tile to newly painted ceiling.

c. Materials shall be dry and clean at time of application.

3.3 INSTALLATION

A. Special Techniques:

1. Installation shall be in accordance with Manufacturer's recommendations:
   a. Do not install tile when room temperature exceeds or below recommended ambient conditions.
   b. Tile is directional tile and must be installed in same direction of pattern running parallel to long dimension of each room.
   c. Remove loose dust from back of tile and ceiling where adhesive is to be applied.
   d. Prime 3 inch (75 mm) minimum circle near each corner by buttering very thin coat of adhesive.
   e. Apply daub of adhesive to each corner. Daubs will be of sufficient size to form a circle 2-1/2 to 3 inches (63 to 75 mm) in diameter and 1/8 to 1/4 inch (3 to 6 mm) thick when tile is pressed firmly in place. Do not apply daubs so far in advance of installation that adhesive skins over.
   f. Do not bend tile during installation.
2. Tile Layout:
   a. Lay out tile symmetrically about center lines of room.
   b. Lay out so tiles at room perimeters are at least 1/2 full tile size.
   c. Leave tile in true plane with straight, even joints.
   d. Tile joints shall be straight and in alignment, and exposed surface flush and level.
   e. Furnish and install specified molding wherever tile has exposed edges or abuts walls, columns, and other vertical surfaces, except at curves of 3 inch (75 mm) radius or smaller.
   f. Cut around penetrations that are not to receive moldings cleanly with sharp knife and at a slight angle away from cutout.
3. Ceiling mounted items:
   a. Locate light fixtures, speakers, and mechanical diffusers and grilles symmetrically in room and centered on tile centers or tile joints insofar as possible, unless shown otherwise.
   b. Keep method of locating ceiling mounted items as consistent as possible throughout building.
   c. Ceiling mounted item location method within each room shall always be consistent.

3.4 FIELD QUALITY CONTROL

A. Non-Conforming Work:

1. Acoustical Tile. The following have been identified by the Manufacturer as tile defects, should not be installed, and will be replaced at no charge to Owner. Manufacturer will replace any material that does not meet product specifications. Installer to call 1 (800) 442-4212 immediately to report any tile discrepancies:
   a. Obvious Tile Defects:
      1) Gross surface defects or damage.
      2) Gross damage to edges and corners.
      3) Bevels without paint.
   b. Size Measurement:
      1) Tiles measure 12 inches (305 mm), plus or minus 1/32 inch (0.8 mm), measured across center of two (2) parallel sides.
   c. Squareness Measurement:
      1) Measure two (2) diagonals of an individual ceiling tile.
      2) Diagonal measurements need to be within 1/16 inch (1.6 mm) of each other. No more than 1/16 inch (1.6 mm) difference.
   d. Warp:
      1) Tiles specification is plus or minus 0.050 inch (1.27 mm) as measured in the center of tile.

2. Installer:
   a. Substrate preparation and installation of ceiling tile not following CISCA Code of Practice will be unacceptable and considered defective and subject to replacement at no cost to Owner.

3.5 ADJUSTING

A. 'Touch-up' minor abraded surfaces.

3.6 CLEANING

A. Remove from site debris connected with work of this Section.

END OF SECTION

SECTION 09 6816

SHEET CARPETING: Back Cushion, Direct Glue

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes But Is Not Limited To: Removal and installation of new carpet in the clerks office. waiting room and Stake Presidents office.

B. Coordination, sequencing, and scheduling installation of Owner-Furnished carpet, carpet base, carpet accessories, leveling compounds as described in Contract Documents and including following:
   a. Pre-Installation Conference held in conjunction with Section 09 6813.
   b. Maintain Building Ambient Conditions including normal levels of humidity, lighting, heating, and air conditioning for acceptability for beginning floor preparation and carpet installation.
   c. Protection of carpet after installation of carpeting as required.

C. Related Requirements:
   1. Section 01 1200: 'Multiple Contract Summary' for carpet and carpet base excluded from Contract and furnished and installed by Owner. This Section establishes quality of materials and installation for information of Contractor, Architect, and Owner's Representatives.

D. Related Requirements:
   1. Section 01 0000: 'General Requirements':
      a. Section 01 1200: Owner will furnish and install carpet tiles and carpet base. This Section establishes quality of materials and installation for information of Contractor, Architect, and Owner's Representatives.

1.2 REFERENCES

A. Association Publications:
   1. The Carpet and Rug Institute (CRI), Dalton, GA www.carpet-rug.org. Standard for Installation Specification of Commercial Carpet:
      a. CRI Indoor Air Quality (IAQ):
         1) CRI Green Label Plus Certification.

B. Reference Standards:
   1. The Carpet and Rug Institute (CRI):
      a. CRI 104, 'Standard For Installation of Commercial Carpet' (Sept 2015).
      b. CRI TM-102, 'School Carpet Minimum Average Specifications'.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Coordinate completion of carpet installation with other trades.

B. Pre-Installation Conference:
   1. Participate in MANDATORY pre-installation conference as specified in Section 09 0503 and held jointly with Section 09 6813 pre-installation conference.
   2. Schedule pre-installation conference before installation of flooring system.
   3. Conference may be held at project site or another convenient site. Participants may also attend by video or audio conference if approved by Project Manager.
   4. Schedule conference after substrate preparation and ONE (1) week before installation of flooring system.

2. Schedule pre-installation conference before installation of flooring system.
3. Conference may be held at project site or another convenient site. Participants may also attend by video or audio conference if approved by Project Manager.
4. Schedule conference after substrate preparation and ONE (1) week before installation of flooring system.

1.4 DELIVERY, STORAGE, AND HANDLING

A. General:
1. Comply with instructions and recommendations of Manufacturer for special delivery, storage, and handling requirements.

B. Delivery And Acceptance Requirements:
1. Deliver materials and accessories necessary for completion of carpet installation to site before beginning installation of carpet.
2. Do not deliver materials before date scheduled for installation.
3. Transport carpet in manner that prevents damage and distortion. Bending or folding individual carpet rolls or cuts from rolls is not recommended. When bending or folding is unavoidable for delivery purposes, carpet is required to be unrolled and allowed to lie flat immediately upon arrival at installation site.

C. Storage And Handling Requirements:
1. Store carpet and related materials in a climate-controlled, dry space.
2. Protect carpet from soil, dust, moisture and other contaminants and store on a flat surface.
3. Stacking heavy objects on top of carpet rolls or stacking more than three rolls is prohibited.

1.5 FIELD CONDITIONS

A. Ambient Conditions:
1. Building Conditions:
a. Conditions inside building shall be brought to levels to be normal at occupancy of building. Conditions include normal levels of humidity, lighting, heating, and air conditioning. (HVAC must be in operation thru out carpet installation):
1) Carpet installation is not to begin until HVAC system is operational and following conditions are maintained for at least forty-eight (48) hours before, during and seventy-two (72) hours after completion:
a) Carpet is to be installed when indoor temperature is between 65° - 95° F (18° - 35° C) with maximum relative humidity of 65%.
b) Substrate surface temperature should not be less than 65° F (18° C) at time of installation.
c) Do not allow temperature of indoor carpeted areas to fall below 50° F (10° C), regardless of age of installation.
2) Maintain fresh air ventilation after installation for seventy-two (72) hours minimum or until lingering odors are gone.
2. Concrete Slab:
a. General:
1) Do not install carpet over concrete slabs until slabs have cured and are sufficiently dry to bond with adhesive.

1.6 WARRANTY

A. Manufacturer Warranty:
1. Provide Carpet Manufacturer's standard Warranty which includes following:
a. Warranty shall cover defects in installation, workmanship, and installation materials.
b. Warranty includes specific workmanship warranties for delamination, edge raveling, fuzzing, pilling, and other textural changes which can be controlled through proper manufacturing (no

fraying, zippering, delamination, edge raveling, fuzzing, pilling in carpet is acceptable for any reason).

c. Warranty terms will include inspection of defective area within fifteen (15) days of receipt of written notice from Owner and completion of corrective work within forty-five (45) days, unless other arrangements are made in writing with Owner on case-by-case basis.

d. Carpet defect or installation defect:
   1) Carpet Manufacturer may use any reasonable means to cure first three (3) breaches of warranty affecting an area of carpeting bounded by natural breaks such as doorways, stairs, rostrum and platform ('affected carpet area'). Such cure must preserve as uniform a blended appearance, acceptable to Carpet Manufacturer and Owner, as exists throughout Installation Site at time of breach.
   2) If carpet defect or installation defect continues to appear after three (3) separate notices for correction from Owner, replace carpet where defects have occurred.

e. If Carpet Manufacturer follows installation requirements of Section 09 0503 'Floor Substrate Preparation' Carpet Manufacture accepts liability of carpet installation for said given time as outlined in Special Warranty regardless of any climate or condition changes affecting RH levels of floor substrate.

2. Special Warranty:
   a. Sheet Carpeting.
      1) General:
         a) Appearance Retention to be provided with Special Warranty requirements if not already included in Standard Warranty.
      2) Meetinghouse, Mission Office, and O&M / R&I:
         a) Owner Carpet Program Product: Provide twenty (20) year minimum or Carpet Manufacturer's better Warranty on carpet system.

PART 2 - PRODUCTS

2.1 OWNER-FURNISHED PRODUCTS

A. Materials:
   1. Carpet: Match existing.
      a. Category One Approved Manufacturer and Color / Patterns. See Section 01 6200 for definitions of Categories:
   2. Carpet Base:
      a. 4-1/2 inch (115 mm) wide base without cushion backing:
         1) Top edge of base serged with 1-1/4 inch (32 mm) polyester binding fabric.
         2) Roll edges of binding fabric under and sew along top edge of carpet cove base.
      b. Carpet:
         1) Category One Approved Products. See Section 01 6200 for definitions of Categories.
            a) Mannington: Ultrabac RE, Color: Black.
            b) Bigelow Commercial (Mohawk): Spectrum V30, Color: 7234 Ebony Domino.
            c) Tandus Centiva: Abrasive Action II, Color: Winter Gray 19103.

2.2 ACCESSORIES

A. Carpet Accessories: Snap-in vinyl reducer strips and vinyl track.

B. Floor Leveling Compound, Floor Patching Compound, And Latex Underlayment: As recommended and approved by Carpet Manufacturer.

PART 2 - PRODUCTS

2.1 OWNER-FURNISHED PRODUCTS

A. Category One Approved Manufacturers. See Section 01 6200 for definitions of Categories:
   1. Materials supplied for carpet installation shall be complete package from specified Carpet Manufacturer:
      a. Lees, Division of Mohawk Carpets, Glasgow, VA:
         1) Contact Information: Help Line (800) 523-5555 or (801) 397-5626.
      b. Mannington Commercial Carpets, Calhoun, GA:
         1) Contact Information: Help Line Voice Mail (800) 241-2262, ext 8045 or Mannington Installation Services, email lds@mannington.com or (855) 466-2664.
      c. Tandus Centiva: Dalton, GA www.tandus-centiva.com.
         1) Contact Information: Tracy Riddle - cell (801) 580-5147 fax (866) 861-7522 Tracy.Riddle@Tarkett.com.

B. Design Criteria:
   1. General:
      a. Commercial Match:
         1) Colors, texture and pile of any product selected as carpet standard or custom designed specifically for Owner needs to be consistent in appearance.
         2) When new carpet is installed next to existing carpet, two pieces need to be within tolerance acceptable as commercial match (Two shade variations maximum).
         3) Regardless of reason, if commercial match is not achievable, existing carpet needs to be replaced to acceptable breaking point approved by Owner's Representative.
         4) If changes in supply chains or unforeseen circumstances require standard pattern to be re-engineered, new carpet must be made close to original as possible.
         5) New product must be approved by Owner.
      b. Compatibility:
         1) Materials supplied for carpet installation shall be complete package from specified Carpet Manufacturer. Do not mix items from material packages of different carpet Manufacturers.
         2) Provide carpet, seam sealers, adhesives, and other related materials that are compatible with one another and with substrates under conditions of service and application.
      c. Tested Products:
         1) New technology and products not allowed unless pre-approved by Owner.
   2. Carpet Material Requirements:
      a. Carpet Backing:
         1) Broadloom - Attached Cushion
            a) Manufacturer's preference that meets or exceeds specification and life cycle warranty expectation.
      b. Cushion Thickness:
         1) Attached cushion thickness shall be 0.10 inch minimum when tested in accordance with ASTM D3676.
      c. Fiber:
         1) Meetinghouse, Mission Office, and O&M / R&I:
            a) Antron Lumina and/or Legacy only.
         2) CES, S&I Module, and O&M / R&I:
            a) Institute:
               (1) Antron Lumina and/or Legacy only.
            b) Seminary:
               (1) Antron Lumina and/or Legacy only.
            c) Antron Lumina and/or Legacy only.
         3) Bishop's Storehouse, Deseret Industries:
            a) Office Areas:
               (1) Antron Lumina and/or Legacy only.
            b) Retail Space:
               (1) Antron Lumina and/or Legacy only.

d. Life Expectancy (Sheet Carpeting):
   1) Meetinghouse, Mission Office, and O&M / R&I: twenty (20) years minimum.
   2) CES, S&I Module, and O&M / R&I:
      a) Institute: twenty-five (25) years minimum.
      b) Seminary: twenty-five (25) years minimum.
   3) Bishop's Storehouse, Deseret Industries:
      a) Office Areas: fifteen (15) years minimum.
      b) Retail Space: ten (10) years minimum.

e. Modification Ratio:
   1) Meetinghouse, Mission Office, and O&M / R&I: 1.5 or less.
   2) CES, S&I Module, and O&M / R&I:
      a) Institute: 1.5 or less.
      b) Seminary: 1.5 or less.
   3) Bishop's Storehouse, Deseret Industries:
      a) Office Areas: 1.5 or less.
      b) Retail Space: 1.5 or less.

f. Pile Yarn Floor Construction:
   1) Meet standard for average pile yarn weight tested under ASTM D5848.
      a) Carpet will retain eighty-five (85) percent of these amounts at end of the warranty period.

3. Carpet Physical Performance:
   a. Appearance Retention Requirements:
      1) Foot Traffic Classification and Testing Requirements:
         a) Severe Traffic Criteria:
            (1) Carpet is to be tested in accordance to ASTM D5252 with an Actionbac secondary backing meeting short term cycles (4000) grading scale of 3.5 and long-term cycles (12000) grading scale of 3.5 with appearance retention measured according.
            (2) Carpet needs to be able to maintain 3.5 rating for eighty-five (85) percent of its warranty expected life cycle in accordance to ASTM D7330.
      2) Severe Traffic:
         a) Meetinghouse, Mission Office, and O&M / R&I.
         b) CES, S&I Module, and O&M / R&I.
         c) Bishop's Storehouse, Deseret Industries:
            (1) Office Areas.
            (2) Retail Space.
   b. British Spill Test:
      1) Carpet must past British Spill Test (formally known as the National Health Service Patient Area Requirement for the United Kingdom, Method E: Part 2):
         a) Test involves controlled spilling of blue dyed liquid from 1-meter (39 inches) height onto carpet product.
         b) Spill is allowed to stand for period of twenty-four (24) hours, after which cuts are made through carpet in area of spill to establish whether there was penetration into or through carpet composite.
   c. Colorfastness:
      1) Colorfastness to Crocking: AATCC 165:
         a) Color transfer Class 4 minimum, wet and dry, when tested as specified.
      2) Colorfastness to Light: AATCC 16.3:
         a) Not less than 4 after 40 AFU (AATCC fading units). Colorfastness to Light, Xenon-Arc (60 AFU) (AATCC Fading Unit).
      3) Colorfastness to Water: AATCC 107:
         a) Color transfer Class 4 minimum, AATCC Transference Scale (only yarn dyed carpets) (grade change in color and staining).
   d. Compression Resistance and Compression Set Attached Cushion:
      1) Minimum CLD of 7 lb per cu in (0.194 kg per cu cm) at 25 percent deflection, and maximum compression set of 10 percent after 50 percent constant compression when tested in accordance with ASTM D3676 with modification to allow recovery at 158 deg F (70 deg C) instead of room temperature for thirty (30) minutes.
   e. Critical Radiant Flux (CRF):

1) Meet requirements of ASTM E648 Standard Test Method - Minimum Class 1 Critical Radiant Flux (CRF) of 0.45 watts/cm2 or greater when tested in accordance with flooring radiant panel test using ASTM E648 Standard Test Method for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source as the test method.

f. Delamination:
   1) Resistance to Delamination (Actionbac secondary backing): Not less than 3.5 lbf/in (15 N/mm) when tested in accordance with ASTM D3936.
   2) Resistance to Delamination (Attached Cushion): Not less than 15,000 cycles when tested in accordance with ASTM D6963.

g. Dimensional Stability:
   1) 0.2 percent or less when tested in accordance with ISO 2551, 'Dimensional Stability (Aachen Test)'.

h. Dry Breaking Strength:
   1) Not less than 100 lbs (445 N) when tested in accordance with ASTM D2646.

i. Electrostatic Propensity of Carpets:
   1) Electrostatic shock propensity with maximum 3.5 kV when tested in accordance with AATCC 134, 'Step Method'.

j. Flammability and Smoke Resistant:
   1) Smoke Density:
      a) Smoke density generated from carpet and backing must not exceed 450 when tested in the flaming mode using ASTM E662, 'Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials'.
      or
      b) NFPA 258, 'Standard Research Test Method for Determining Smoke Generation of Solid Materials as test methods'.

k. Indoor Air Quality (IAQ):
   1) CRI Test Program ASTM D5116.
   2) Method for determination of VOC emitted from carpet using specific sorbent tube and thermal desorption/gas chromatography as per ASTM 7339.
   3) Carpet, adhesives, and seam sealers shall be VOC compliant as certified with CRI Indoor Air Quality Carpet Testing Program Green Label Plus or tested for compliance to meet the CRI IAQ Carpet Testing Program requirements and criteria as per ASTM D5116 CRI Test Program.

l. Soil Resist Treatment:
   1) Minimum average of 350 ppm fluorine on the pile fiber when 3 separate tests are conducted in accordance with CRI TM-102 test method.
   2) Installed carpet shall exhibit stain resisting ability equal to or exceeding that of any other premium carpet available at time of manufacture allowing removal of most foreign substances using generally accepted cleaning procedures and more aggressive cleaning procedures for stubborn stains without leaving any more visible stain and/or change in color than the most stain resistant premium carpet available at time of manufacture.

m. Stain Resistance:
   1) Minimum stain resistance rating of 8 when tested in accordance with AATCC 175, 'Stain Resistance: Pile Floor Coverings.

n. Tuff Bind (dry):
   1) Not less than 10 lbs (45 N) when tested in accordance with ASTM D1335.

2.2 SOURCE QUALITY CONTROL

A. Tests:
   1. Carpet:
      a. Appearance Retention Rating:
         1) Hexapod Test Method: ASTM D5252.
         2) Grading: ASTM D7330.
      b. Antimicrobial Activity: AATCC 174.
      c. British Spill Test: Test Protocol.
      d. Colorfastness:

1) Crocking: AATCC 165.
2) Light: AATCC 16.3.
3) Water: AATCC 107.

e. Delamination: ASTM D3936 and ASTM D6962.
f. Dimensional Stability: ISO 2551.
g. Dry Breaking Strength: ASTM 2646.
h. Electrostatic Propensity of Carpets: AATCC 134.
i. Flame and Smoke Resistant. Provide carpet complying with ratings as indicated for following:
1) Flooring Radiant Panel Test (Critical Radiant Flux), ASTM E648, NFPA 253.
2) Smoke Density Test: ASTM E662.
j. Indoor Air Quality:
1) ASTM 7339.
2) Indoor Air Quality: CRI Test Program ASTM D5116.
k. Pile Yarn Weight: ASTM D5848.
l. Soil Resist Treatment: CRI TM-102.
m. Stain Resistance: AATCC 175.
n. Turf Bind: ASTM D1335.

2. Attached Backing:
a. Carpet Backing: ASTM D3676.
b. Compression Resistance (constant deflection): ASTM D3676.
c. Compression Set (constant force): ASTM D3676.
d. Cushion Density: ASTM D3676.
e. Cushion Thickness: ASTM D3676.

PART 3 - EXECUTION

3.1 FIELD QUALITY CONTROL

A. Field Tests:
1. Carpet Manufacturer is responsible that concrete slab Alkalinity and Concrete Moisture Vapor Emission Rate (MVER) Testing for each Project is within Carpet Manufacturer's acceptable levels.

B. Field Inspections:
1. Carpeting:
a. Unacceptable carpet after installation shall include but not be limited to:
1) Delaminating carpet from backings.
2) Fiber loss less than specified.
3) Edge raveling.
4) Fuzzing of carpet fibers.
5) Pilling of carpet fibers.
6) Appearance retention less than control samples attached to Agreement.
7) Dye bleeding.
8) Zippering fibers in carpet.
9) Color streaking.
10) Irregular tufts of fiber.

b. Unacceptable workmanship shall include but not be limited to:
1) Improper floor preparation before installation.
2) Failure of adhesive to completely adhere carpet to floor resulting in bubbles, ridges, or ripples where carpet has separated from floor.
3) Seams that do not comply with specified requirements:
a) Raveled or untrimmed seams.
b) Seams not sealed, level, straight, or even.
c) Open seams.
d) Seams visibly open when viewed by Project Manager from standing position.
4) Sequence rolls, commercial match issues created by rolls being installed out of sequence will require correction or replacement.

5) Failure to properly install carpet next to walls and door frames to eliminate gaps or puckering of carpet.
6) Use of unspecified carpet.
7) Carpet base ends not finished to terminate at door frames or vertical trim shall have 45 degree angle 'birdsmouth' finish.
8) Adhesive exposed on carpet, on carpet base, beyond edges of carpet base, and on other surfaces of building.
9) Carpet base that is not scribed to fit against floor with no gaps.
10) Carpet base attached by means other than acceptable carpet base adhesive.

C. Non-Conforming Work:
1. Carpeting:
a. Basis of Acceptable Carpeting: Source Quality Control Testing:
1) Carpet products not meeting Design Criteria and Source Quality Control Testing of this specification will be considered unacceptable carpeting.
b. Unacceptable Carpeting:
1) Unacceptable carpeting will be rejected and shall be repaired or replaced at no additional cost to Owner. Owner's Representative will determine reasonable location of acceptable transition points for removal of unacceptable carpet. Minimum replacement size shall be:
a) Between nearest existing seams.
b) Between natural transition points or 12 feet (3.6 meters) of running length.

END OF SECTION

SECTION 09 7226

SISAL WALL COVERING

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Furnishing and installing wall covering 'Type A' (Sisal) All walls of new waiting area. Remove sisal wainscot on walls of Stake Presidents office. Install new sisal and chair railing after installation and finishes are applied to new gypsum board wall.

B. Related Requirements:
   1. Section 06 4512: 'Architectural Woodwork Wood Trim' for wood trim for sisal wall covering.
   2. Section 09 2900: 'Gypsum Board' for priming of gypsum board.

1.2 REFERENCES

A. Definitions:
   1. Class A: Fire classification for product with flame spread rating of no more than 25 and smoke developed rating not exceeding 50, when tested in accordance with ASTM E84 or UL 723.
      a. Flame Spread: The propagation of flame over a surface.
      b. Flame Spread Index: The numerical value assigned to a material tested in accordance with ASTM E84 or UL 723.
      c. Smoke-Developed Index: The numerical value assigned to a material tested in accordance with ASTM E84 or UL 723.
      d. Surface Burning Characteristic: Rating of interior and surface finish material providing indexes for flame spread and smoke developed, based on testing conducted according to ASTM Standard E84 or UL 723.

B. Action Submittals:
   1. Product Data:
      a. Manufacturer's literature or cut sheet.
      b. Maintenance instructions.
      c. Color and pattern selection.

C. Informational Submittals:
   1. Test And Evaluation Reports:
      a. Copies of Quality Assurance requirements for 'Class A' flame spread rating and 'Room-Corner Test'.
   2. Qualification Statement:
      a. Installer:
         1) Provide Qualification documentation if requested by Architect or Owner.

D. Closeout Submittals:
   1. Include following in Operations And Maintenance Manual specified in Section 01 7800:
      a. Operations and Maintenance Data:
         1) Cleaning and maintenance instructions.
      b. Record Documentation:
         1) Manufacturers Documentation:
            a) Manufacturer's literature or cut sheets.
            b) Color and pattern selections.

1.3 QUALITY ASSURANCE

A. Regulatory Agency Sustainability Approvals:
   1. Fire-Test-Response Characteristics: As determined by testing identical wall coverings applied with identical adhesives to substrates according to test method indicated below by qualified testing agency. Identify products with appropriate markings of applicable testing agency.
      a. Surface-Burning Characteristics:
         1) Wall covering shall have Class A flame spread rating in accordance with ASTM E84 or UL 723 Type 1.
            a) Class A (Flame spread index 0-25; Smoke-developed index 0-450).
            b) Flash point: None.
   2. Passage of 'Room-Corner Test' as recognized by AHJ, is required for system. Adhesive cited in test literature is required for installation of wall covering on Project.
      a. Room Corner Tests:
         1) ASTM E84, 'Standard Test Method for Surface Burning Characteristics of Building Materials'.
         2) IBC 803.1.3, 'Room Corner Test for Textile Wall Coverings and Expanded Vinyl Wall Coverings'.
         3) IBC 803.1.4, 'Acceptance Criteria for Textile and Expanded Vinyl Wall Coverings Tested to ASTM E84 or UL 723'.
         4) NFPA 265, 'Standard Methods of Fire Tests for Evaluating Room Fire Growth Contribution of Textile Coverings on Full Height Panels and Walls'.
         5) UL 723, 'Standard for Safety Test for Surface Burning Characteristics of Building Materials'.

B. Qualifications:
   1. Installer: Requirements of Section 01 4301 applies, but not limited to following:
      a. Minimum three (3) years experience in wall covering installations.
      b. Minimum five (5) years satisfactorily completed projects of comparable quality, similar size, and complexity in past three (3) years before bidding.
      c. Agree to view 'No-Flame Sisal Wall Covering Recommended Installation Procedures' provided by Owner found on internet in AEC Webpage under Training in Menu tab. Contact Architect for access to video. This requirement may be waived by Owner, if Installer has viewed video before or can document at least two (2) satisfactorily completed projects of comparable size using sisal wall coverings in past three (3) years before bidding.
      d. Upon request, submit documentation and video verification.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Delivery And Acceptance Requirements:
   1. Deliver materials in sealed containers with Manufacturer's labels intact.

B. Storage And Handling Requirements:
   1. Store materials in protected area at temperatures below 90 deg F (32 deg C) and above 50 deg F (10 deg C). Keep from freezing.
   2. Keep container tightly closed in well-ventilated area, and store upright when not in use.
   3. Shelf life: One (1) year minimum - Unopened containers.

1.5 FIELD CONDITIONS

A. Ambient Conditions:
   1. Apply when the temperature is between 50 deg F (10 deg C) minimum and 100 deg F (38 deg C) maximum and relative humidity is less than seventy-five (75) percent.
   2. Provide good ventilation.

1.6 WARRANTY

A. Manufacturer Warranty:
   1. Provide five (5) year warranty against manufacturing defects.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturer Contact List:
   1. Design Materials Inc, Kansas City, KS www.dmikc.com
   2. Fibreworks, Louisville, KY www.fibreworks.com.

2.2 DESCRIPTION

A. Colors: Color selected by architect to match existing sisal wainscot in building.

2.3 MATERIALS

A. Sisal Wall Covering:
   1. 100 percent fire-treated sisal yarn.
   2. 1/4 inch (6 mm) pile height, 48 oz/sq yd (1 627 grams/sq meter) minimum. Sisal to be installed full height on walls shall be furnished in 9 or 13 foot (2.75 or 3.96 meters) wide goods.
   3. Reversible weave type, without backing.

2.4 ACCESSORIES

A. Wall Covering Adhesive:
   1. Category Four Approved Products. See Section 01 6200 for definitions of Categories.
      a. 257 Sisal Adhesive by Fibreworks.
      b. Sisal Adhesive No. 1-422 by Design Materials.

B. Seam Cement:
   1. Type Two Acceptable Products.
      a. 8415 Glue-Down Carpet Seam Adhesive by Roberts Consolidated Industries, Div QEP, Henderson, NV www.robertsconsolidated.com.
      b. Equal as recommended by Wall Covering Manufacturer with approval of Architect before installation. See Section 01 6200.

PART 3 - EXECUTION

3.1 INSTALLERS

A. Acceptable Installers:
   1. Meet Quality Assurance Installer Qualifications as specified in Part 1 of this specification.

3.2 EXAMINATION

A. Verification Of Conditions:
   1. Examine substrate and verify that it is suitable for installation of sisal wall covering.
   2. Notify Architect of unsuitable conditions in writing.

a. Do not install over unsuitable conditions.

3. Commencement of Work by installer is considered acceptance of substrate.

3.3 INSTALLATION

A. Apply wall covering in accordance with Manufacturer's instructions, available on DVD from Owner through Architect. See Quality Assurance Installer Qualifications as specified in Part 1 of this specification.

B. Using specified adhesive, glue continuously to surface to be covered with wall covering. Apply adhesive in accordance with Manufacturer's recommendations.

C. Run 'ribs' in weaving horizontally (panel style) when installing wall covering full height. If sisal installed only as wainscoting, 'ribs' may be installed vertically. Install wall covering so it extends to within 1/8 inch (3 mm) of floor slab.

D. Carry sisal around corners approximately 6 inch (152 mm) making no outside corner cuts.

END OF SECTION

SECTION 09 9001

COMMON PAINTING AND COATING REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Common procedures and requirements for field-applied painting and coating.

B. Related Requirements:
   1. Section 05 0503: 'Shop-Applied Metal Coatings' for quality of shop priming of steel and iron.
   2. Section 07 9213: 'Elastomeric Joint Sealants' for quality of Elastomeric Joint Sealants.
   3. Sections under 09 9000 heading 'Paints and Coatings'.

1.2 REFERENCES

A. Definitions:
   1. Damage Caused By Others: Damage caused by individuals other than those under direct control of Painting Applicator (MPI(a), PDCA P1.92).
   2. Gloss Levels:
      a. Specified paint gloss level shall be defined as sheen rating of applied paint, in accordance with following terms and values, unless specified otherwise for a specific paint system.

Gloss Level '1'	Traditional matte finish - flat	0 to 5 units at 60 degrees to 10 units maximum at 85 degrees.
Gloss Level '2'	High side sheen flat - 'velvet-like' finish	10 units maximum at 60 degrees and 10 to 35 units at 85 degrees.
Gloss Level '3'	Traditional 'eggshell-like finish	10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees.
Gloss Level '4'	'Satin-like' finish	20 to 35 units at 60 degrees and 35 units minimum at 85 degrees.
Gloss Level '5'	Traditional semi-gloss	35 to 70 units at 60 degrees.
Gloss Level '6'	Traditional gloss	70 to 85 units at 60 degrees.
Gloss Level "7'	High gloss	More than 85 units at 60 degrees.

   3. Properly Painted Surface:
      a. Surface that is uniform in appearance, color, and sheen and free of foreign material, lumps, skins, runs, sags, holidays, misses, strike-through, and insufficient coverage. Surface free of drips, spatters, spills, and overspray caused by Paint Applicator. Compliance will be determined when viewed without magnification at a distance of 5 feet (1.50 m) minimum under normal lighting conditions and from normal viewing position (MPI(a), PDCA P1.92).
   4. Latent Damage: Damage or conditions beyond control of Painting Applicator caused by conditions not apparent at time of initial painting or coating work.

B. Reference Standards:
   1. The latest edition of the following reference standard shall govern all painting work:
      a. MPI(a), 'Architectural Painting Specification Manual' by Master Painters Institute (MPI), as issued by local MPI Accredited Quality Assurance Association having jurisdiction.

EDIT REQUIRED: Include following paragraph if there is work on previously finished surfaces.

b. MPI(r), 'Maintenance Repainting Manual' by Master Painters Institute (MPI), as issued by local MPI Accredited Quality Assurance Association having jurisdiction.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Pre-Installation Conferences:
1. Schedule painting pre-installation conference after delivery of paint or coatings and before or at same time as application of field samples.
   a. Coordinate pre-installation conferences of all related painting and coating Sections under 09 9000 heading 'Paints and Coatings'.
   b. Schedule conference before preparation of control samples as specified in Sections under 09 9000 heading 'Paints and Coatings'.
   c. Conference to be held at same time as Section 09 2900 to review gypsum board finish preparation.
2. In addition to agenda items specified in Section 01 3100, review following:
   a. Review Quality Assurance for Approval requirements.
   b. Review Quality Assurance Field Sample requirements.
   c. Review Submittal requirements for compliance for MPI Approved Products.
   d. Review Design Criteria requirements.
   e. Review Cleaning requirements.
   f. Review painting schedule.
   g. Review safety issues
3. Review additional agenda items from Sections under 09 9000 heading 'Paints and Coatings'.

1.4 SUBMITTALS

A. Action Submittals:
1. Product Data:
   a. Include following information for each painting product, arranged in same order as in Project Manual.
      1) Manufacturer's cut sheet for each product indicating ingredients and percentages by weight and by volume, environmental restrictions for application, and film thicknesses and spread rates.
      2) Provide one (1) copy of 'MPI Approved Products List' showing compliance for each MPI product specified.
         a) MPI Information is available from MPI Approved Products List using the following link: http://www.paintinfo.com/mpi/approved/index.shtml.
      3) Confirmation of colors selected and that each area to be painted or coated has color selected for it.
2. Samples: Provide two 4 inch by 6 inch (100 mm by 150 mm) minimum draw-down cards for each paint or coating color selected for this Project.

B. Informational Submittals:
1. Manufacturer Instructions.
   a. Manufacturer's substrate preparation instructions and application instruction for each painting system used on Project.
2. Qualification Statement:
   a. Applicator:
      1) Provide Qualification documentation if requested by Architect or Owner.

C. Closeout Submittals:
1. Include following in Operations And Maintenance Manual specified in Section 01 7800:
   a. Record Documentation:
      1) Manufacturer's documentation:
         a) Manufacturer's cut sheet for each component of each system.
         b) Schedule showing rooms and surfaces where each system was used.

D. Maintenance Materials Submittals:
   1. Extra Stock Materials:
      a. Provide painting materials in Manufacturer's original containers and with original labels in each color used. Label each can with color name, mixture instructions, date, and anticipated shelf life.
      b. Provide one (1) quart of each finish coat and one (1) pint of each primer and of each undercoat in each color used.

1.5 QUALITY ASSURANCE

A. Regulatory Agency Sustainability Approval:
   1 Conform to work place safety regulations and requirements of those authorities having jurisdiction for storage, mixing, application and disposal of all paint and related hazardous materials.
   2. Paint and painting materials shall be free of lead and mercury, and have VOC levels acceptable to local jurisdiction.
   3. Master Painters Institute (MPI) Standards:
      a. Products: Comply with MPI standards indicated and listed in 'MPI Approved Products List'.
      b. Preparation and Workmanship: Comply with requirements in 'MPI Architectural Painting Specification Manual' for products and coatings indicated.

B. Qualifications:
   1. Applicator: Requirements of Section 01 4301 applies, but not limited to following:
      a. Minimum five (5) years' experience in painting installations.
      b. Minimum five (5) satisfactorily completed projects of comparable quality, similar size, and complexity in past three (3) years before bidding.
      c. Maintain qualified crew of painters throughout duration of the Work.
      d. Upon request, submit documentation.

C. ield Samples:
   1. Before application of any paint system, meet on Project site with Architect, Owner's representative, and Manufacturer's representative. Architect may select one (1) surface for application of each paint system specified. This process will include establishing acceptable substrate conditions required for Project before application of paints and coatings.
   2. Apply paint systems to surfaces indicated by Architect following procedures outlined in Contract Documents and Product Data submission specified above.
   3. After approval of samples, proceed with application of paint system throughout Project. Approved samples will serve as standard of acceptability.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Delivery And Acceptance Requirements:
   1. Deliver specified products in sealed, original containers with Manufacturer's original labels intact on each container.
   2. Deliver amount of materials necessary to meet Project requirements in single shipment.
   3. Notify Architect two working days before delivery of coatings.

B. Storage And Handling Requirements:
   1. Store materials in single place.
   2. Keep storage area clean and rectify any damage to area at completion of work of this Section.
   3. Maintain storage area at 55 deg F (13 deg C) minimum.

1.7 FIELD CONDITIONS

A. Ambient Conditions:
   1. Perform painting operations at temperature and humidity conditions recommended by Manufacturer for each operation and for each product for both interior and exterior work.

2. Apply painting systems at lighting level of 540 Lux (50 foot candles) minimum on surfaces to be painted.
   a. Inspection of painting work shall take place under same lighting conditions as application.
   b. If painting and coating work is applied under temporary lighting, deficiencies discovered upon installation of permanent lighting will be considered latent damage as defined in MPI Manual, PDCA P1-92.

PART 2 - PRODUCTS

2.1 SYSTEMS

A. Performance:
   1. Design Criteria:
      a. Provide materials for use within each coating system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
      b. All materials, preparation and workmanship shall conform to requirements of 'Architectural Painting Specification Manual' by Master Painters Institute (MPI).
      c. All paint manufacturers and products used shall be as listed under Approved Product List section of MPI Painting Manual.
      d. Provide Premium Grade systems (2 top coats) as defined in MPI Architectural Painting Specification Manual, except as otherwise indicated.
      e. Where specified paint system does not have Premium Grade, provide Budget Grade.
      f. Provide products of same manufacturer for each coat in coating system.
      g. Where required to meet LEED (Leadership in Energy and Environmental Design) program requirements, use only MPI listed materials having an "L" rating designation.
      h. Color Levels:
         1) Color Level II:
            a) Number and placement of interior and exterior paint colors and gloss levels shall be as defined by Color Level II from MPI Manual, PDCA P3-93 as modified in following paragraph.
            b) No more than one paint color or gloss level will be selected for same substrate within designated interior rooms or exterior areas.
         2) Color Level III:
            a) Number and placement of interior and exterior paint colors and gloss levels shall be Color Level III from MPI Manual, PDCA P3-93 as modified in following paragraph.
            b) Several paint colors or gloss levels will be selected for same substrate within designated interior rooms or exterior areas.

B. Materials:
   1. Materials used for any painting system shall be from single manufacturer unless approved otherwise in writing by painting system manufacturers and by Architect. Include manufacturer approvals in Product Data submittal.
   2. Linseed oil, shellac, turpentine, and other painting materials shall be pure, be compatible with other coating materials, bear identifying labels on containers, and be of highest quality of an approved manufacturer listed in MPI manuals. Tinting color shall be best grade of type recommended by Manufacturer of paint or stain used on Project.

PART 3 - EXECUTION

3.1 APPLICATORS

A. Approved Applicators:
   1. Meet Quality Assurance Applicator Qualifications as specified in Part 1 of this specification.

3.2 EXAMINATION

A. Verification Of Conditions:
   1. Directing applicator to begin painting and coating work will indicate that substrates to receive painting and coating materials have been previously inspected as part of work of other Sections and are complete and ready for application of painting and coating systems as specified in those Sections.

B. Pre-Installation Testing:
   1. Before beginning work of this Section, examine, and test surfaces to be painted or coated for adhesion of painting and coating systems.
   2. Report in writing to Architect of conditions that will adversely affect adhesion of painting and coating work.
   3. Do not apply painting and coating systems until party responsible for adverse condition has corrected adverse condition.

C. Evaluation And Assessment:
   1. Report defects in substrates that become apparent after application of primer or first finish coat to Architect in writing and do not proceed with further work on defective substrate until such defects are corrected by party responsible for defect.

3.3 PREPARATION

A. Protection Of In-Place Conditions:
   1. Protect other finish work and adjacent materials during painting. Do not splatter, drip, or paint surfaces not intended to be painted. These items will not be spelled out in detail but pay special attention to the following:
      a. Do not paint finish copper, bronze, chromium plate, nickel, stainless steel, anodized aluminum, or monel metal except as explicitly specified.
      b. Keep cones of ceiling speakers completely free of paint. In all cases where painting of metal speaker grilles is required, paint without grilles mounted to speakers and without grilles on ceiling.
      c. On existing work where ceiling is to be painted, speakers and grilles are already installed, and ceiling color is not being changed, mask off metal grilles installed on ceiling speakers. If ceiling color is being changed, remove metal grilles and paint, and mask off ceiling speakers.

B. Surface Preparation:
   1. Prepare surfaces in accordance with MPI requirements and requirements of Manufacturer for each painting system specified, unless instructed differently in Contract Documents. Bring conflicts to attention of Architect in writing.
   2. Fill minor holes and cracks in wood surfaces to receive paint or stain.
   3. Surfaces to be painted shall be clean and free of loose dirt. Clean and dust surfaces before painting or finishing.
   4. Do no exterior painting while surface is damp, unless recommended by Manufacturer, nor during rainy or frosty weather. Interior surfaces shall be dry before painting. Moisture content of materials to be painted shall be within tolerances acceptable to Paint Manufacturer.
   5. Sand woodwork smooth in direction of grain leaving no sanding marks. Clean surfaces before proceeding with stain or first coat application.

3.4 APPLICATION

A. Interface With Other Work:
   1. Coordinate with other trades for materials and systems that require painting before installation.
   2. Schedule painting and coating work to begin when work upon which painting and coating work is dependent has been completed. Schedule installation of pre-finished and non-painted items, which are to be installed on painted surfaces, after application of final finishes.

B. Paint or finish complete all surfaces to be painted or coated, to include new toilet rooms. New 2nd level classroom, mothers room, and vestibule. Patch and paint foyers and corridors affected by new work.

C. Apply sealant in gaps 3/16 inch (5 mm) and smaller between two substrates that are both to be painted or coated. Sealants in other gaps furnished and installed under Section 07 9213.

D. On wood to receive a transparent finish, putty nail holes in wood after application of stain using natural colored type to match wood stain color. Bring putty flush with adjoining surfaces.

E. In multiple coat paint work, tint each succeeding coat with slightly lighter color, but approximating shade of final coat, so it is possible to check application of specified number of coats. Tint final coat to required color.

F. Spread materials smoothly and evenly. Apply coats to not less than wet and dry film thicknesses and at spreading rates for specified products as recommended by Manufacturer.

G. Touch up suction spots after application of first finish coat.

H. Paint shall be thoroughly dry and surfaces clean before applying succeeding coats.

I. Use fine sandpaper between coats as necessary to produce even, smooth surfaces.

J. Make edges of paint adjoining other materials or colors clean, sharp, and without overlapping.

K. Finished work shall be a 'Properly Painted Surface' as defined in this Section.

3.5 FIELD QUALITY CONTROL

A. Non-Conforming Work:
   1. Correct deficiencies in workmanship as required to leave surfaces in conformance with 'Properly Painted Surface,' as defined in this Section.
   2. Correction of 'Latent Damage' and 'Damage Caused By Others,' as defined in this Section, is not included in work of this Section.

3.6 CLEANING

A. General:
   1. As work proceeds and upon completion of work of any painting Section, remove paint spots from floors, walls, glass, or other surfaces and leave work clean, orderly, and in acceptable condition.

B. Waste Management:
   1. Remove rags and waste used in painting operations from building each night. Take every precaution to avoid danger of fire.
   2. Paint, stain and wood preservative finishes and related materials (thinners, solvents, caulking, empty paint cans, cleaning rags, etc.) shall be disposed of subject to regulations of applicable authorities having jurisdiction.
   3. Remove debris caused by work of paint Sections from premises and properly dispose.
   4. Retain cleaning water and filter out and properly dispose of sediments.

END OF SECTION

SECTION 09 9123

INTERIOR PAINTED GYPSUM BOARD, PLASTER

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Preparing, priming, and finish painting new interior gypsum board and existing plaster surfaces as described in Contract Documents.
   2. Preparing and painting following existing interior gypsum board and plaster surfaces as described in Contract Documents:
      a. Stain new hardwood chair railing in 2nd level classroom and mothers room.

B. Related Requirements:
   1. Section 09 9413: 'Interior Textured Finishing' for textured finishes.

1.2 ADMINISTRATIVE REQUIREMENTS

A. Pre-Installation Conferences:
   1. Participate in pre-installation conference as specified in Section 09 2900.
      a. In addition to agenda items specified in Section 01 3100 and Section 09 2900, review following:
         1) Review finish level requirements of gypsum wallboard as specified in Section 09 2900.
   2. Participate in pre-installation conference as specified in Section 09 9001.

PART 2 - PRODUCTS

2.1 SYSTEM

A. Manufacturers:
   1. Category Four Approved Manufacturers and Products. See Section 01 6200 for definitions of Categories.
      a. Products listed in edition of MPI Approved Product List current at time of bidding and later are approved, providing they meet VOC requirements in force where Project is located.

B. Description:
   1. Rest Rooms:
      a. New Surfaces: Use MPI(a) INT 9.2F Waterborne Epoxy Finish system.
      b. Previously Finished Surfaces: Use MPI(r) RIN 9.2E Waterborne Epoxy Finish system.
   2. All Other:
      a. New Surfaces: Use MPI(a) INT 9.2B Latex Finish system.
      b. Previously Finished Work: Use MPI(r) RIN 9.2B Latex Finish system.

C. Performance:
   1. Design Criteria:
      a. New Surfaces: MPI Premium Grade finish requirements.
      b. Deteriorated Existing Surfaces: MPI Premium Grade finish requirements.
      c. Sound Existing Surfaces: MPI Custom Grade requirements.
      d. Gloss / Sheen Required:
         1) Rest Rooms And Custodial Rooms: Gloss Level 6.

e. Rest Rooms, Font Room, And Custodial Rooms:
   1) Buildings with only Gypsum Board surfaces in rooms:
      a) MPI Product 115, 'Epoxy-Modified Latex, Interior, Gloss (MPI Gloss Level 6)'.
f. Remaining Painted Surfaces:
   1) MPI Product 141, 'Latex, Interior, High Performance Architectural, Semi-Gloss (MPI Gloss Level 5)'.

PART 3 - EXECUTION

3.1 APPLICATION

A. General: See appropriate paragraphs of Section 09 9001.

B. New Surfaces:
   1. Primer: Apply primer to be covered with other paint coats with roller only, or with spray gun and back-rolled.

C. Existing Painted Surfaces:
   1. Remove deteriorated existing paint down to sound substrate by scraping or sanding. Feather edges of existing paint by sanding to be smooth with adjacent surfaces.
   2. Clean surface with mild soap and water, or with tri-sodium phosphate (TSP). Wash surfaces that have been defaced with marking pens, crayons, lipstick, etc, with solvent recommended by Paint Manufacturer. Spot prime such surfaces.
   3. Spackle and tape cracks. Sand to smooth finish and spot prime.
   4. Sand or chemically etch existing painted surface as required to prepare surface to accept new paint.
   5. Re-clean surface.
   6. Apply primer coat.
   7. Apply finish coats.

END OF SECTION

SECTION 09 9124

INTERIOR PAINTED METAL

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Preparing and painting new interior metal surfaces as described in Contract Documents.
   2. Preparing and painting following existing interior metal surfaces as described in Contract Documents:
      a. Hollow metal door frames.
      b. Metal vanity brackets.

B. Related Requirements:
   1. Section 05 5871: 'Metal Brackets'.
   2. Section 09 9001: 'Common Painting And Coating Requirements':

C. Sequencing:
   1. Paint brackets furnished under Section 05 5871 before installation of bracket.

PART 2 - PRODUCTS

2.1 SYSTEM

A. Manufacturers:
   1. Category Four Approved Products and Manufacturers. See Section 01 6200 for definitions of Categories.
      a. Products listed in edition of MPI Approved Product List current at time of bidding and later are approved, providing they meet VOC requirements in force where Project is located.

B. Description:
   1. Ferrous Metal:
      a. New Surfaces: Use MPI(a) INT 5.1B Waterborne Light Industrial Finish system.
      b. Previously Finished Surfaces: Use MPI(r) RIN 5.1B Waterborne Light Industrial Finish system.
   2. Galvanized Metal:
      a. New Surfaces: Use MPI(a) INT 5.3J Latex Finish system
      b. Previously Finished Surfaces: Use MPI(r) RIN 5.3AH Latex Finish system.
   3. Aluminum:
      a. New Surfaces: Use MPI(a) INT 5.4E Waterborne Light Industrial Finish system.
      b. Previously Finished Surfaces: Use MPI(r) REX 5.4E Light Industrial Finish system.

C. Performance:
   1. Design Requirements:
      a. New Surfaces: MPI Premium Grade finish requirements.
      b. Deteriorated Existing Surfaces: MPI Premium Grade finish requirements.
      c. Sound Existing Surfaces: MPI Custom Grade finish requirements.
      d. Gloss / Sheen Level Required: Gloss Level 5.

D. Materials:
   1. Primers:
      a. Ferrous Metal: MPI Product 107, 'Primer, Rust-Inhibitive, Water Based'.
      b. Galvanized Metal: MPI Product 134: 'Primer, Galvanized, Water Based'.

c. Aluminum: MPI Product 95: 'Primer, Quick Dry, for Aluminum'.

2. Finish Coats: MPI Product 153: 'Light Industrial Coating, Interior, Water Based, Semi-Gloss (MPI Gloss Level 5)'.

PART 3 - EXECUTION

3.1 APPLICATION

A. General:
   1. See appropriate paragraphs of Section 09 9001.
   2. Systems specified are in addition to prime coats furnished under other Sections.

B. New Surfaces: Remove rust spots by sanding and immediately spot prime. If all traces of rust cannot be removed, apply rust blocker recommended by Paint Manufacturer before applying full primer coat.

C. Existing Painted Surfaces:
   1. Remove deteriorated existing paint down to sound substrate by scraping and sanding. Feather edges of existing paint by sanding to be smooth with adjacent surfaces. Spot prime bare metal surfaces immediately.
   2. Remove rust spots by sanding and immediately spot prime. If all traces of rust cannot be removed, apply rust blocker recommended by Paint Manufacturer before applying full primer coat.
   3. Clean existing sound painted surfaces as well as scraped and sanded existing painted surfaces as recommended by Paint Manufacturer.
   4. Apply prime coat over entire surface to be painted.
   5. Lightly sand entire surface.
   6. Clean surface as recommended by Paint Manufacturer.
   7. Apply finish coats.

END OF SECTION

SECTION 09 9324

INTERIOR CLEAR-FINISHED HARDWOOD

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Preparing and finishing of new interior clear finished hardwood chair railings and doors as described in Contract Documents.

B. Related Requirements:
   1. Section 08 1429: 'Interior Flush Wood Doors'.
   2. Section 09 9001: 'Common Painting And Coating Requirements'.

1.2 REFERENCES

1.3 ADMINISTRATIVE REQUIREMENTS

A. Pre-Installation Conferences:
   1. Participate in pre-installation conference as specified in Section 09 9001.
   2. In addition to agenda items specified in Section 01 3100 and Section 09 9001, review following:
      a. Review control sample(s).

1.4 SUBMITTALS

A. Action Submittals:
   1. Samples:
      a. Interior Hardwood for Transparent Finish:
         1) Requirements for samples are specified in Related Requirement Sections listed above.
      b. Design Criteria:
         1) Sample will be used as performance standard for evaluating finish provided.

B. Informational Submittals:
   1. Test And Evaluation Reports:
      a. Before beginning finish work, submit Finish Manufacturer's literature or certification that finish material meets requirements of ANSI / KCMA A161.1.

PART 2 - PRODUCTS

2.1 SYSTEM

A. Materials:
   1. Design Criteria:
      a. See appropriate paragraphs of Section 09 9001.
   2. Stain: MPI 90, 'Stain, Semi-Transparent, for Interior Wood'.
   3. Clear Finish Coats:
      a. Field Finished:
         1) Chemcraft International Inc:
            a) First, Second, And Third Coats: 20 Sheen Opticlear Pre-Catalyzed Lacquer.
         2) ICI Dulux / Trinity:

a) First Coat: ICE Vinyl Sanding Sealer.
b) Second And Third Coats: ICI Pre-Catalyzed Lacquer.

3) Lilly / Valspar:
a) First, Second, And Third Coats: 20 Sheen Pre-Catalyzed Lacquer 587E208.

4) Sherwin-Williams:
a) First Coat: T67F3 Vinyl Sealer.
b) Second And Third Coats: T77F38 Sherwood Pre-Catalyzed Lacquer DRE.

b. Mill Finished: Architectural Woodwork finished in a mill may use one (1) coat of Vinyl Sealer and two (2) coats of Conversion Varnish or three (3) coats of Conversion Varnish from one (1) of the approved Finish Manufacturers, as recommended by Finish Manufacturer.

c. Products meeting testing requirements for finishes of ANSI / KCMA A161.1 may be used upon approval of submission by Architect before use. See Section 01 6200.

4. Color:
a. Design Criteria:
1) Finish to match existing hardwood finishes in building.
a) Application:
(1) Use quart spray pot. Apply gently and lightly to surface.
(2) Use control sample at all times.
(3) Spray on stain and let stand five (5) minutes before wiping off. Let dry sixteen (16) hours (or overnight).
(4) Use sealer and let dry one (1) hour.
(5) Buff surfaces with 220 grit sanding sponge blocks.
(6) Blow off dust.
(7) Spray on toner (let dry thirty (30) minutes minimum).
(8) Spray on finish.

PART 3 - EXECUTION

3.1 APPLICATION

A. General:
1. See appropriate paragraphs of Section 09 9001.
2. Sand entire exposed surface of item to be finished lightly with 120 to 150 non-stearated sandpaper and clean before applying dye or stain.
3. Apply stain in accordance with Manufacturer's recommendations and as necessary to attain correct color.
4. Scuff sand with 220 non-stearated sandpaper between application of application stain and first finish coat.
5. If wood is finished before installation, finish cut ends and other unfinished, exposed surfaces same as previously finished surfaces after installation of wood.

B. Where back-priming is required, apply one coat of finish material.

C. Architectural Woodwork Door Surfaces (cabinetry doors only):
1. Finish architectural woodwork doors with no hardware applied to doors.

END OF SECTION

SECTION 09 9413

INTERIOR TEXTURED FINISHING

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Furnish and apply texturing on walls and ceilings of vestibule, ADA compliant toilet room, two family friendly toilet rooms and new privacy wall in mothers room. Repair and paint existing areas affected by remodel.

B. Related Requirements:
   1. Section 09 2900: 'Gypsum Board' for priming.
   2. Section 09 9001: 'Common Painting And Coating Requirements' for:
      a. Pre-installation conference for Sections under 09 9000 heading 'Paints and Coatings'.
   3. Section 09 9123: 'Interior Painted Gypsum Board, Plaster' for finish painting.

1.2 REFERENCES

A. Definitions:
   1. Drywall Texture: Compound rolled, sprayed, or troweled onto sheetrock after taping and floating of joints is complete. Uses same material as joint compound, but thinned down with water and applied to wall surface:
      a. Light Orange Peel: Sprayed texture leaves light splatter on walls. Resembles peel of orange. If done with fine spray, can be one of the lightest, least noticeable of the texture styles. Match existing building textures.
      b. Light Skip Trowel - Texture is applied to ceilings with trowel. Trowel marks may be left on surface to give a rustic, hand crafted look. Match existing textured ceilings.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Pre-Installation Conferences:
   1. Participate in pre-installation conference as specified in Section 09 9001.
   2. In addition to agenda items specified in Section 01 3100 and Section 09 9001, review following:
      a. Review control samples.

1.4 SUBMITTALS

A. Action Submittals:

1.5 QUALITY ASSURANCE

A. Field Samples:
   1. Before performing work of this Section, prepare control samples.
   2. Architect will inspect control sample at pre-installation conference following preparation of control sample. When sample is approved, work of this Section may proceed. Approved samples will be kept at site at all times work of this section is being performed.

PART 2 - PRODUCTS

2.1 SYSTEM

A. Manufacturers:
   1. Manufacturer Contact List:
      a. National Gypsum, Charlotte, NC www.nationalgypsum.com.
      b. U S Gypsum Co, Chicago, IL www.usg.com.

B. Materials:
   1. Class Two Quality Standards: See Section 01 6200.
      a. ProForm Perfect Spray EM/HF by National Gypsum.
      b. Sheetrock Wall & Ceiling Texture by U S Gypsum.

PART 3 - EXECUTION

3.1 APPLICATION

A. Location:
   1. Walls:
      a. Light Orange Peel Texture:
         1) All areas except those listed in following paragraph.
      b. Smooth:
         1) Restrooms. Mechanical Rooms, Storage Rooms, and other Utility Areas.
   2. Ceilings:
      a. Light Skip Trowel Texture:
      b. Smooth Finish (no applied texture) to be applied to the following ceilings:
         1) Restrooms.

B. Finishing:
   1. Light Orange Peel Texture:
      a. After gypsum board is taped and sanded, apply texture. Closely match samples accepted by Architect.
         1) After wall has been textured, apply priming and finish paint as specified in Section 09 9123.
   2. Skip Trowel Texture:
      a. After gypsum board is taped and sanded, apply texture. Closely match samples accepted by Architect.
         1) After wall has been textured, apply priming and paint as specified in Section 09 9123.
   3. Smooth:
      a. No applied texture is required. Apply priming and paint as specified in Section 09 9123.
         1) Restrooms. Mechanical Rooms, Storage Rooms, and other Utility Areas.
   4. Ceilings:

END OF SECTION

SECTION 10 2113

METAL TOILET COMPARTMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Furnish and install metal toilet compartments to match existing.

B. Related Requirements:
   1. Section 06 1100: 'Wood Framing' for blocking in wood framing for compartment installation and door bumper.

1.2 REFERENCES

A. Reference Standards:
   1. ASTM International:
      a. ASTM A484/A484M-18a, 'Standard Specification for General Requirements for Stainless Steel Bars, Billets, and Forgings'.

1.3 SUBMITTALS

A. Action Submittals:
   1. Product Data:
      a. Color selection.

B. Closeout Submittals:
   1. Include following in Operations And Maintenance Manual specified in Section 01 7800:
      a. Warranty Documentation:
         1) Final, executed copy of Warranty.
      b. Record Documentation:
         1) Manufacturers documentation:
            a) Manufacturer's literature or cut sheet.
            b) Color selection.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Delivery And Acceptance Requirements:
   1. Materials shall be delivered in original, unopened packages with labels intact.

B. Storage And Handling Requirements:
   1. Store and handle in compliance with Manufacturer's instructions and recommendations.

1.5 WARRANTY

A. Manufacturer Warranty:
   1. Manufacturer's standard warranty.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Type One Acceptable Manufacturers:
1. Accurate Partitions Inc, Lyons, IL www.accuratepartitions.com.
2. AMPCO Products Inc, Miami, FL www.ampco.com.
3. Columbia Partitions, Columbia, SC www.psisc.com.
4. Flush-Metal Partition Corp, Maspeth, NY www.flushmetal.com.
5. Global Steel Products Corp, Eastanollee, GA www.globalpartitions.com.
6. Hadrian Inc, Mentor, OH www.hadrian-inc.com.
7. Knickerbocker Partitions Corp, Freeport, NY www.knickerbockerpartition.com.
8. Metpar, Westbury, NY www.metpar.com.
9. Equal as Approved by Architect before bidding. See Section 01 6200.

2.2 MANUFACTURED UNITS

A. Toilet And Miscellaneous Partitions:
1. Floor-mounted, overhead-braced.
2. Panels:
   a. Galvanized bonderized steel sheets (minimum 0.00015 inch (0.004 mm) zinc coating).
   b. Edges bound interlocked with drawn molding welded on corners.
   c. Corners welded and ground smooth.
   d. Sound deadening honeycomb core.
   e. Provide wood blocking on all panels that have grab bars.
   f. Gauge:
      1) Doors: 22 ga (0.08 mm) minimum.
      2) Panels: 22 ga (0.08 mm) minimum.
      3) Pilasters: 22 ga (0.08 mm) minimum.
      4) Screens: 22 ga (0.08 mm) minimum.
3. Posts:
   a. 20 ga (one mm) minimum of same construction and finish as panels.
4. Headrails:
   a. Aluminum.
   b. 20 ga (one mm) minimum of same construction and finish as panels.
   c. Anti-grip design.
5. Plinths:
   a. 20 ga (one mm) Type 304 stainless steel, Number 4 finish.
   b. 3 inch (76 mm) minimum high, secured with concealed clips.
   c. All fasteners used to attach Plinths, Posts and Pilasters to the floor shall be Type 304 stainless steel.
6. Anchorages and fasteners:
   a. Concealed: Non-corrosive, protective finish.
   b. Tamper resistant Torx Head with pin screws.
7. Hardware:
   a. Each door:
      1) Gravity type hinges with double handed, nylon bottom cam, adjustable for partial door closing position, bottom hinge finished flush with door bottom.
      2) Sliding or concealed door bolt with emergency access.
      3) Door strike and keeper with rubber bumper.
      4) Coat hook / door bumper.
   b. Finish: Chrome plated.
   c. Meet requirements of ASTM B86, Alloy AG 40A.

B. Urinal Partition:
1. Basic construction same as panels above, floor mounted.

2.3 FINISHES

A. Finish And Color:
   1. Powder-coated paint finish. Color to match existing.
   2. Class One Color Quality Standards. See Section 01 6200.

		Almond	**White**
a.	Accurate:	920 Almond	980 White
b.	Ampco:	466PC Porcelain	White 949PC
c.	Columbia:	Tan	White
d.	Global:	Almond 2103	White 2129
e.	Flush-Metal:	35 Beige or 70 Vanilla	61 White or 25 Oyster White
f.	Hadrian:	Almond 603	504 Linen
g.	Knickerbocker:	Almond 1111	White
h.	Metpar:	Almond 300	White 149

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification Of Conditions:
   1. Field verify dimensions.
   2. Verify that necessary blocking has been installed in framed walls for partition installation and for place where coat hook / door bumper will strike wall.

3.2 INSTALLATION

A. Install pilasters rigid, plumb, and level. Maintain proper door openings. Anchor pilaster to floor with Type 304 stainless steel fasteners embedded 2 inches (50 mm) into concrete slab below setting bed.

B. Secure panels to walls with two stirrup brackets minimum attached near top and bottom of each panel. Use fasteners of length to provide one-inch (25 mm) embedment into blocking or masonry.

C. Secure overhead brace to face sheets with two fasteners minimum per face. Set door tops parallel with brace. Set door bottom 12 inches (300 mm) above floor.

D. Plinth to be level with and snug to floor.

3.3 FIELD QUALITY CONTROL

A. Non-Conforming Work: Non-conforming work as covered in the General Conditions applies, but is not limited to the following:
   1. Correct any work found defective or not complying with contract document requirements at no additional cost to the Owner.
   2. Replace damaged or severely scratched materials with new materials at no additional cost to the Owner.

3.4 ADJUSTING

A. Lubricate hardware as recommended by Manufacturer.

B. Set hinges on out-swinging doors to return to nearly closed position.

C. Perform final adjustments to pilaster leveling devices, door hardware, and other operating parts of partition assembly just before Substantial Completion.

3.5 CLEANING

A. Remove protective masking. Clean exposed surfaces of partitions, hardware, fittings, and accessories.

B. Touch-up minor scratches and other finish imperfections using materials and methods recommended by Manufacturer.

END OF SECTION

SECTION 10 2813

COMMERCIAL TOILET ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

A. Included But Is Not Limited To:
   1. Selected accessories for Rest Rooms,
   2.
   3. **EDIT REQUIRED:** Include following paragraph only if Folding Bench is shown on Contract Drawings.
      a. Grab Bars.
      b. Mirrors.
      c. Sanitary Napkin Disposal Container.
      d. Shelf.
      e. Single Robe Hook.

B. Related Requirements:
   1. Section 06 1100: 'Wood Framing' for blocking.
   2. Section 06 2001: 'Common Finish Carpentry Requirements' for installation.

C. Products Furnished But Not Installed Under This Section:
   1. Selected accessories for Rest Rooms:
      a. Automatic touchless towel dispensers.
      b. Soap dispensers.
      c. Toilet tissue dispensers.

D. Related Requirements:
   1. Section 01 1200: 'Multiple Contract Summary' soap dispensers, paper towel dispensers, and toilet tissue dispensers furnished and installed by Owner (FM Group).

1.2 REFERENCES

A. Association Publications:
   1. United States Access Board:
      a. Americans with Disabilities Act (ADA):
         1) ADA Standards:
            a) ADA Accessibility Guidelines (ADAAG) (2004 or latest version).

B. Reference Standards:
   1. ASTM International:
      a. A153/A153M-16a, 'Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware'.
      b. ASTM A653/A653M-17, 'Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process'.
      c. ASTM A666-15, 'Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar'.
      d. ASTM C1036-18, 'Standard Specification for Flat Glass'.
      e. ASTM F446-85(2009), 'Standard Consumer Safety Specification for Grab Bars and Accessories Installed in the Bathing Area'.
   2. International Code Council / American National Standards Institute:
      a. ICC/ANSI A117.1-2017, 'Accessible and Usable Buildings and Facilities'.
   3. International Standard Organization:
      a. ISO 25537:2008, 'Glass in Building - Silvered Flat Glass Mirror.

1.3 SUBMITTALS

A. Action Submittals:
   1. Product Data:
      a. Manufacturer's product data sheets indicating operating characteristics, materials and finishes.
      b. Mounting requirements and rough-in dimensions.
   2. Shop Drawings:
      a. Schedule showing items used, location where installed, and proper attaching devices for substrate.

B. Informational Submittals:
   1. Manufacturers' Instructions:
      a. Provide operation, care and cleaning instructions.

C. Closeout Submittals:
   1. Include following in Operations And Maintenance Manual specified in Section 01 7800:

PART 2 - PRODUCTS

2.1 OWNER FUNISHED PRODUCTS

A. Category One Approved Products (Furnished and Installed by Owner):
   1. Automatic Touchless Towel Dispensers:
      a. Mount Towel Dispenser in 'Recessed Waste Receptacle Cabinet'.
      b. Category One Approved Products. See Section 01 6200 for definitions of Categories: Georgia-Pacific enMotion model no. 59460:
         1) Size: 14.8 inches (376 mm) wide x 9.75 inches (248 mm) deep x 16.75 inches (425 mm) high.
         2) Power source: battery.
         3) Color: splash blue.
   2. Soap dispensers.
   3. Toilet tissue dispensers.

2.2 MANUFACTURED UNITS

A. Manufacturers:
   1. Manufacturer Contact List:
      a. AJW Architectural Products, A&J Washroom Accessories, Inc., New Windsor, NY www.ajwashroom.com.
      b. American Specialties Inc (ASI), Yonkers, NY www.americanspecialties.com.
      c. Bobrick Washroom Equipment Inc, North Hollywood, CA www.bobrick.com or Bobrick Washroom Equipment of Canada Ltd, Scarborough, ON (416) 298-1611.
      d. Bradley Corp, Menomonee Falls, WI www.bradleycorp.com.
      e. General Accessory Manufacturing Co (GAMCO), Durant, OK www.gamcousa.com.

B. Materials:
   1. Design Criteria:
      a. Stainless Steel: ASTM A666 Type 304 (18-8); satin finish exposed surfaces unless otherwise indicated.
      b. Galvanized-Steel Mounting Devices: ASTM A153/A153M, hot-dip galvanized after fabrication.
      c. Fasteners:
         1) Exposed: Screws, bolts, and other devices of same material as accessory unit and tamper-and-theft resistant.
         2) Concealed: Galvanized Steel.

2. Rest Rooms:
   a. Mirrors:
      1) Channel-Frame Mirror:
         a) Frame: Type 304 or Type 430, 20 gauge stainless steel channel frame.
         b) Roll-formed one piece construction.
         c) Exposed surfaces have #4 satin finish.
         d) Edges and corners are burr free.
         e) Glass: 1/4 inch (6.4 mm) silver coated and hermetically sealed. Guaranteed for 15 years against silver spoilage. Mirrors meet ASTM C1036 requirements.
         f) Concealed surface mounted wall hanger.
      2) Category Four Approved Products. See Section 01 6200 for definitions of Categories:
         a) AJW Architectural Products: Model U711.
         b) American Specialties (ASI): Model 0620.
         c) Bobrick: Model B-165.
         d) Bradley: Model 781.
         e) General Accessory (GAMCO): Model C Series.
   b. Sanitary Napkin Disposal Container:
      1) Design Criteria:
         a) Surface mounted type 304, 22 gauge stainless steel with #4 satin finish. Seamless construction with radius and hemmed edges.
         b) Stainless steel piano hinge.
      2) Category Four Approved Products. See Section 01 6200 for definitions of Categories:
         a) AJW Architectural Products: Model U590.
         b) American Specialties (ASI): Model 0852.
         c) Bobrick: Model B-270.
         d) Bradley: Model 4781-15.
         e) General Accessory (GAMCO): Model ND-1.
   c. Single Robe Hook:
      1) Surface mounted type 304, 22 gauge stainless steel with #4 satin finish.
      2) Concealed mounting bracket.
      3) Stainless steel locking setscrew on bottom.
      4) Category Four Approved Products. See Section 01 6200 for definitions of Categories:
         a) AJW Architectural Products: Model UX110SF.
         b) American Specialties (ASI): Model 7340-S.
         c) Bobrick: Model B6717.
         d) Bradley: Model 9114.
         e) General Accessory (GAMCO): Model 76717.
   d. Grab Bars:
      1) Configuration shown on Contract Drawings. Include center support for longer lengths when required:
      2) Design Criteria:
         a) Comply with ADA guidelines and ADAAG accessible design for structural strength and local and state codes.
         b) Concealed mount.
         c) 18 ga (1.27 mm), type 304 stainless steel tubing.
         d) 1-1/2 inch (38 mm) diameter.
         e) Provide center support when required.
         f) Snap-on flange covers.
         g) Peened (non-slip) finish.
         h) Sustain loads in excess of 900 lbs (408 kg).
      3) Category Four Approved Products. See Section 01 6200 for definitions of Categories:
         a) AJW Architectural Products: Model UG3 Series.
         b) American Specialties (ASI): Model 3800 Series.
         c) Bobrick: Model B-6806 Series.
         d) Bradley: Model 812 Series.
         e) General Accessory (GAMCO): Model 150 Series.
   e. Shelf:
      1) Design Criteria:
         a) 18 ga (1.27 mm), stainless steel with No. 4 Satin finish.
         b) 6 inches (150 mm) wide.

2) Category Four Approved Products. See Section 01 6200 for definitions of Categories:
   a) AJW Architectural Products: Model U776.
   b) American Specialties (ASI): Model 0692.
   c) Bobrick: Model B-296.
   d) Bradley: Model 756.
   e) General Accessory (GAMCO): Model S-6.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Comply with ADA Accessibility Guidelines and installation heights as shown on Contract Drawings.

B. Assemble fixtures and associated fittings and trim in accordance with manufacturer's instructions.

C. Install using mounting devices proper for base structure.

D. Install equipment level, plumb, and firmly in place in accordance with manufacturer's rough-in drawings.

E. Where possible, mount like items in adjoining compartments back-to-back on same partition.

F. Grab Bars:
   1. Install as per Manufacturers written installation instructions.
   2. Install grab bars to withstand downward force of not less than 250 lbf (1112 N) per ASTM F446.

3.2 REPAIR

A. Repair or replace defective work, including damaged equipment and components.

B. Repair or replace malfunctioning equipment, or equipment with parts that bind or are misaligned.

3.3 CLEANING

A. Clean unit surfaces, and leave in ready-to-use condition.

3.4 ADJUSTING

A. Test each piece of equipment provided with moving parts to assure proper operation, freedom of movement, and alignment. Install new batteries in battery-powered items.

3.5 CLOSEOUT ACTIVITIES

A. Turn over keys, tools, maintenance instructions, and maintenance stock to Owner.

END OF SECTION

DIVISION 22: PLUMBING

SECTION 22 0501

COMMON PLUMBING REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Common requirements and procedures for plumbing systems.
   2. Responsibility for proper operation of electrically powered equipment furnished under this Division.
   3. Furnish and install sealants relating to installation of systems installed under this Division.
   4. Furnish and install Firestop Penetration Systems for plumbing systems penetrations as described in Contract Documents.

B. Products Furnished But Not Installed Under This Section:
   1 Sleeves, inserts, supports, and equipment for plumbing systems installed under other Sections.

C. Related Requirements:
   1. Section 07 8400: 'Firestopping' for quality of penetration firestop systems to be used on Project and submittal requirements.
   2. Section 07 9213: 'Elastomeric Joint Sealant' for quality at building exterior.
   3. Sections Under 09 9000 Heading: 'Paints And Coatings' for painting of plumbing items requiring field painting.
   4. Division 26: 'Electrical' for raceway and conduit, unless specified otherwise, and line voltage wiring.
   5. Slots and openings through floors, walls, ceilings, and roofs provided under other Divisions in their respective materials.

1.2 SUBMITTALS

A. Action Submittals:
   1. Product Data:
      a. Manufacturer's catalog data for each manufactured item.
         1) Provide section in submittal for each type of item of equipment. Include Manufacturer's catalog data of each manufactured item and enough information to show compliance with Contract Document requirements. Literature shall show capacities and size of equipment used and be marked indicating each specific item with applicable data underlined.
         2) Include name, address, and phone number of each supplier.

B. Informational Submittals:
   1. Qualification Statement:
      a. Plumbing Subcontractor:
         1) Provide Qualification documentation if requested by Architect or Owner.
      b. Installer:
         1) Provide Qualification documentation if requested by Architect or Owner.

C. Closeout Submittals:
   1. Include following in Operations And Maintenance Manual specified in Section 01 7800:
      a. Operations and Maintenance Data (Modify and add to requirements of Section 01 7800):
         1) At beginning of PLUMBING section of Operations And Maintenance Manual, provide master index showing items included:
            a) Provide name, address, and phone number of Architect, Architect's Mechanical Engineer, General Contractor, and Plumbing subcontractor.

b) Identify maintenance instructions by using same equipment identification used in Contract Drawings. Maintenance instructions shall include:
   (1) List of plumbing equipment used indicating name, model, serial number, and nameplate data of each item together with number and name associated with each system item.
   (2) Manufacturer's maintenance instructions for each piece of plumbing equipment installed in Project. Instructions shall include name of vendor, installation instructions, parts numbers and lists, operation instructions of equipment, and maintenance instructions.
c) Provide operating instructions to include:
   (1) General description of fire protection system.
   (2) Step by step procedure to follow for shutting down system or putting system into operation.

b. Warranty Documentation:
   1) Include copies of warranties required in individual Sections of Division 22.

1.3 QUALITY ASSURANCE

A. Regulatory Agency Sustainability Approvals:
   1. Perform work in accordance with applicable provisions of Plumbing Codes applicable to Project. Provide materials and labor necessary to comply with rules, regulations, and ordinances.
   2. In case of differences between building codes, laws, local ordinances, utility company regulations, and Contract Documents, the most stringent shall govern. Notify Architect in writing of such differences before performing work affected by such differences.
   3. Identification:
      a. Motor and equipment name plates as well as applicable UL / ULC and AGA / CGA labels shall be in place when Project is turned over to Owner.

B. Qualifications. Requirements of Section 01 4301 applies, but not limited to following:
   1. Plumbing Subcontractor:
      a. Company specializing in performing work of this section.
         1) Minimum five (5) years experience in plumbing installations.
         2) Minimum five (5) satisfactorily completed installations in past three (3) years of projects similar in size, scope, and complexity required for this project before bidding.
      b. Upon request, submit documentation.
   2. Installer:
      a. Licensed for area of Project.
      b. Designate one (1) individual as project foremen who shall be on site at all times during installation and experienced with installation procedures required for this project.
      c. Upon request, submit documentation.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Delivery And Acceptance Requirements:
   1. Accept valves on site in shipping containers with labeling in place.
   2. Provide temporary protective coating on cast iron and steel valves.
   3. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.

B. Storage And Handling Requirements:
   1. In addition to requirements specified in Division 01, stored material shall be readily accessible for inspection by Architect until installed.
   2. Store items subject to moisture damage in dry, heated spaces.

1.5 WARRANTY

A. Manufacturer Warranty:

1. Provide certificates of warranty for each piece of equipment made out in favor of Owner.

B. Special Warranty:
   1. Guarantee plumbing systems to be free from noise in operation that may develop from failure to construct system in accordance with Contract Documents.
   2. If plumbing sub-contractor with offices located more than 150 miles (240 km) from Project site is used, provide service / warranty work agreement for warranty period with local plumbing sub-contractor approved by Architect. Include copy of service / warranty agreement in warranty section of Operation And Maintenance Manual.

PART 2 - PRODUCTS

2.1 COMPONENTS

A. Components shall bear Manufacturer's name and trade name. Equipment and materials of same general type shall be of same make throughout work to provide uniform appearance, operation, and maintenance.

B. Pipe And Pipe Fittings:
   1. Weld-O-Let and Screw-O-Let fittings are acceptable.

C. Sleeves:
   1. General:
      a. Two sizes larger than bare pipe or insulation on insulated pipe.
   2. In Concrete And Masonry:
      a. Sleeves through outside walls, interior shear walls, and footings shall be schedule 80 black steel pipe with welded plate.
   3. In Framing And Suspended Floor Slabs:
      a. Standard weight galvanized iron pipe, Schedule 40 PVC, or 14 ga (2 mm) galvanized sheet metal.

D. Valves:
   1. Valves of same type shall be of same manufacturer.

PART 3 - EXECUTION

3.1 INSTALLERS

A. Acceptable Installers:
   1. Meet Quality Assurance Installer Qualifications as specified in Part 1 of this specification.

3.2 EXAMINATION

A. Drawings:
   1. Plumbing Drawings show general arrangement of piping, equipment, etc. Follow as closely as actual building construction and work of other trades will permit.
   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 Plumbing Drawings.
   3. Because of small scale of Drawings, it is not possible to indicate all offsets, fittings, and accessories that 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.

B. Verification Of Conditions:

1. Examine premises to understand conditions that may affect performance of work of this Division before submitting proposals for this work. Examine adjoining work on which plumbing work is dependent for efficiency and report work that requires correction.
2. Ensure 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. If approval is received by Addendum or Change Order to use other than originally specified items, be responsible for specified capacities and for ensuring that items to be furnished will fit space available.
3. Check that slots and openings provided under other Divisions through floors, walls, ceilings, and roofs are properly located. Perform cutting and patching caused by neglecting to coordinate with Divisions providing slots and openings at no additional cost to Owner.
4. No subsequent allowance for time or money will be considered for any consequence related to failure to examine site conditions.

3.3 PREPARATION

A. Changes Due To Equipment Selection:
   1. Where equipment specified or otherwise approved requires different arrangement or connections from that shown in Contract Documents, submit drawings showing proposed installations.
   2. If proposed changes are approved, install equipment to operate properly and in harmony with intent of Contract Documents. Make incidental changes in piping, ductwork, supports, installation, wiring, heaters, panelboards, and as otherwise necessary.
   3. Provide additional motors, valves, controllers, fittings, and other equipment required for proper operation of systems resulting from selection of equipment.
   4. Be responsible for proper location of rough-in and connections provided under other Divisions.

3.4 INSTALLATION

A. Interface With Other Work:
   1. Furnish exact location of electrical connections and complete information on motor controls to installer of electrical system.
   2. Furnish sleeves, inserts, supports, and equipment that are to be installed by others in sufficient time to be incorporated into construction as work proceeds. Locate these items and confirm that they are properly installed.

B. Cut carefully to minimize necessity for repairs to previously installed or existing work. Do not cut beams, columns, or trusses.

C. Locating Equipment:
   1. Arrange pipes and equipment to permit ready access to valves, cocks, unions, traps, and to clear openings of doors and access panels.
   2. Adjust locations of pipes, equipment, and fixtures to accommodate work to interferences anticipated and encountered.
   3. Install plumbing work to permit removal of equipment and parts of equipment requiring periodic replacement or maintenance without damage to or interference with other parts of equipment or structure.
   4. Determine exact route and location of each pipe before fabrication.
      a. Right-Of-Way:
         1) Lines that pitch shall have right-of-way over those that do not pitch. For example, plumbing drains shall normally have right-of-way.
         2) Lines whose elevations cannot be changed shall have right-of-way over lines whose elevations can be changed.
      b. Offsets, Transitions, and Changes in Direction:
         1) Make offsets, transitions, and changes in direction in pipes as required to maintain proper head room and pitch of sloping lines whether or not indicated on Drawings.
         2) Furnish and install all traps, air vents, sanitary vents, and devices as required to effect these offsets, transitions, and changes in direction.

D. Penetration Firestops:
   1. Install Penetration Firestop System appropriate for penetration at plumbing systems penetrations through walls, ceilings, roofs, and top plates of walls.

E. Sealants:
   1. Seal openings through building exterior caused by penetrations of elements of plumbing systems.
   2. Furnish and install acoustical sealant to seal penetrations through acoustically insulated walls and ceilings.

F. Furnish and install complete system of piping, valved as indicated or as necessary to completely control entire apparatus:
   1. 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 Division from responsibility for proper installation of plumbing systems.
   2. Arrange piping to not interfere with removal of other equipment, ducts, or devices, or block access to doors, windows, or access openings:
      a. Arrange so as to facilitate removal of tube bundles.
      b. Provide accessible flanges or ground joint unions, as applicable for type of piping specified, at connections to equipment and on bypasses.
         1) Make connections of dissimilar metals with di-electric unions.
         2) Install valves and unions ahead of traps and strainers. Provide unions on both sides of traps.
      c. Do not use reducing bushings, bull head tees, close nipples, or running couplings. Street elbows are allowed only on potable water pipe 3/4 inch (19 mm) in diameter and smaller.
      d. Install piping systems so they may be easily drained
      e. Install piping to insure noiseless circulation.
      f. Place valves and specialties to permit easy operation and access. Valves shall be regulated, packed, and glands adjusted at completion of work before final acceptance.
   3. Do not install piping in shear walls.
   4. Cut piping accurately to measurements established at site. Remove burr and cutting slag from pipes.
   5. Work piping into place without springing or forcing. Make piping connections to pumps and other equipment without strain at piping connection. Remove bolts in flanged connections or disconnect piping to demonstrate that piping has been so connected, if requested.
   6. Make changes in direction with proper fittings.
   7. Expansion of Thermoplastic Pipe:
      a. Provide for expansion in every 30 feet (9 meters) of straight run.
      b. Provide 12 inch (300 mm) offset below roof line in each vent line penetrating roof.
   8. Expansion of PEX Pipe: Allow for expansion and contraction of PEX pipe as recommended by Pipe Manufacturer.

G. Sleeves:
   1. Do not place sleeves around soil, waste, vent, or roof drain lines passing through concrete slabs on grade.
   2. Provide sleeves around pipes passing through concrete or masonry floors, walls, partitions, or structural members. Seal sleeves with specified sealants. Follow Pipe Manufacturer's recommendations for PEX pipe penetrations through studs and floor slabs.
   3. Sleeves through floors shall extend 1/4 inch (6 mm) above floor finish in mechanical equipment rooms above basement floor. In other rooms, sleeves shall be flush with floor.
   4. Sleeves through floors and foundation walls shall be watertight.

H. Escutcheons:
   1. Provide spring clamp plates where pipes run through walls, floors, or ceilings and are exposed in finished locations of building. Plates shall be chrome plated heavy brass of plain pattern and shall be set tight on pipe and to building surface.

3.5 REPAIR / RESTORATION

A. 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.

1. Patch and repair walls, floors, ceilings, and roofs with materials of same quality and appearance as adjacent surfaces unless otherwise shown.
2. Surface finishes shall exactly match existing finishes of same materials.

3.6 FIELD QUALITY CONTROL

A. Field Tests:
   1. Perform tests on plumbing piping systems. Furnish devices required for testing purposes.

B. Non-Conforming Work:
   1. Replace material or workmanship proven defective with sound material at no additional cost to Owner.
   2. Repeat tests on new material, if requested.

3.7 CLEANING

A. Remove dirt, grease, and other foreign matter from each length of piping before installation:
   1. After each section of piping used for movement of water or steam is installed, flush with clean water, except where specified otherwise.
   2. Arrange temporary flushing connections for each section of piping and arrange for flushing total piping system.
   3. Provide temporary cross connections and water supply for flushing and drainage and remove after completion of work.

B. Clean exposed piping, equipment, and fixtures. Remove stickers from fixtures and adjust flush valves.

3.8 CLOSEOUT ACTIVITIES

A. Instruction of Owner:
   1. Instruct building maintenance personnel and Stake Physical Facilities Representative in operation and maintenance of plumbing systems utilizing Operation And Maintenance Manual when so doing.
   2. Conduct instruction period after Substantial Completion inspection when systems are properly working and before final payment is made.

3.9 PROTECTION

A. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system. 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.

END OF SECTION

SECTION 22 0529

HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Common hanger and support requirements and procedures for plumbing systems.

B. Related Requirements:
   1. Section 07 8400: 'Firestopping' for quality of Penetration Firestop Systems to be used on Project and submittal requirements.
   2. Sections Under 09 9000 Heading: Painting of mechanical items requiring field painting.
   3. Slots and openings through floors, walls, ceilings, and roofs provided under other Divisions in their respective materials.
   4. Section 23 0529: 'Hangers And Supports For HVAC Piping And Equipment' for gas piping used with HVAC equipment.

1.2 SUBMITTALS

A. Action Submittals:
   1. Product Data:
      a. Manufacturer's catalog data for each manufactured item.

PART 2 - PRODUCTS

2.1 ASSEMBLIES

A. Manufacturers:
   1. Manufacturer Contact List:
      a. Anvil International, Portsmouth, NH www.anvilintl.com.
      b. Cooper B-Line, Highland, IL www.b-line.com.
      c. Unistrut, Wayne, MI www.tyco-unistrut.com.

B. Materials:
   1. Hangers, Rods, And Inserts
      a. Galvanized and UL approved for service intended.
      b. Support horizontal piping from hangers or on roller assemblies with channel supports, except where trapeze type hangers are explicitly shown on Drawings. Hangers shall have double nuts.
         1) Support insulated pipes 2 inches (50 mm) in diameter and smaller with adjustable swivel ring hanger with insulation protection shield. Gauge and length of shield shall be in accordance with Anvil design data.
            a) Type Two Acceptable Products:
               (1) Swivel Ring Hanger: Anvil Fig. 69.
               (2) Insulation Protection Shield: Anvil Fig. 167.
               (3) Equals by Cooper B-Line.
         2) Support insulated pipes 2-1/2 inches (64 mm) in diameter and larger with clevis hanger or roller assembly with an insulation protection shield. Gauge and length of shield shall be according to Anvil design data.

a) Type Two Acceptable Products:
(1) Clevis Hanger: Anvil Fig. 260.
(2) Roller Assembly: Anvil Fig. 171.
(3) Insulation Protection Shield: Anvil Fig. 167.
(4) Equals by Cooper B-Line.

3) Support uninsulated copper pipe 2 inches (50 mm) in diameter and smaller from swivel ring hanger, copper plated and otherwise fully suitable for use with copper tubing. Support non-copper uninsulated pipes from swivel ring hanger.
a) Type Two Acceptable Products:
(1) Swivel Ring Hanger For Copper Pipe: Anvil Fig. CT-69.
(2) Swivel Ring Hanger For Other Pipe: Anvil Fig. 69.
(3) Equals by Cooper B-Line.

4) Support uninsulated copper pipe 2-1/2 inches (64 mm) in diameter and larger from clevis hanger, copper plated hangers and otherwise fully suitable for use with copper tubing. Support non-copper uninsulated pipes from clevis hanger.
a) Type Two Acceptable Products:
(1) Clevis Hanger For Copper Pipe: Anvil Fig. CT-65.
(2) Clevis Hanger For Other Pipe: Anvil Fig. 260.
(3) Equals by Cooper B-Line.

c. Support rods for single pipe shall be in accordance with following table:

Rod Diameter	Pipe Size	Rod Diameter	Pipe Size
3/8 inch	2 inches and smaller	10 mm	50 mm and smaller
1/2 inch	2-1/2 to 3-1/2 inches	13 mm	64 mm to 88 mm
5/8 inch	4 to 5 inches	16 mm	100 mm to 125 mm
3/4 inch	6 inches	19 mm	150 mm
7/8 inch	8 to 12 inches	22 mm	200 mm to 300 mm

d. Support rods for multiple pipe supported on steel angle trapeze hangers shall be in accordance with following table:

Rods		Number of Pipes per Hanger for Each Pipe Size						
Number	Diameter	2 Inch	2.5 Inch	3 Inch	4 Inch	5 Inch	6 Inch	8 Inch
2	3/8 Inch	Two	0	0	0	0	0	0
2	1/2 Inch	Three	Three	Two	0	0	0	0
2	5/8 Inch	Six	Four	Three	Two	0	0	0
2	5/8 Inch	Nine	Seven	Five	Three	Two	Two	0
2	5/8 Inch	Twelve	Nine	Seven	Five	Three	Two	Two

Rods		Number of Pipes per Hanger for Each Pipe Size						
Number	Diameter	50mm	64mm	75mm	100mm	125mm	150mm	200mm
2	10 mm	Two	0	0	0	0	0	0
2	13 mm	Three	Three	Two	0	0	0	0
2	16 mm	Six	Four	Three	Two	0	0	0
2	19 mm	Nine	Seven	Five	Three	Two	Two	0
2	22 mm	Twelve	Nine	Seven	Five	Three	Two	Two

1) Size trapeze angles so bending stress is less than 10,000 psi (69 MPa).

e. Riser Clamps For Vertical Piping:

1) Type Two Acceptable Products:
   a) Anvil Fig. 261.
   b) Equals by Cooper B-Line.

f. Concrete Inserts:
   1) Individual Inserts:
      a) Suitable for special nuts size 3/8 inch (9.5 mm) through 7/8 inch (22 mm) with yoke to receive concrete reinforcing rods, and with malleable iron lugs for attaching to forms.
      b) Type Two Acceptable Products:
         (1) Anvil Fig. 282.
         (2) Equals by Cooper B-Line.
   2) Continuous Inserts:
      a) Class Two Quality Standard: Equal to Unistrut P-3200 series.

g. Steel Deck Bracket:
   1) Class Two Quality Standard: Equal to Unistrut P1000 with clamp nut, minimum 6 inch (150 mm) length.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Piping:
   1. Properly support piping and make adequate provisions for expansion, contraction, slope, and anchorage.
      a. Except for underground pipe, suspend piping from roof trusses or clamp to vertical walls using Unistrut and clamps. Do not hang pipe from other pipe, equipment, or ductwork. Laying of piping on any building element is not allowed.
      b. Supports For Horizontal Piping:
         1) Support metal piping at 96 inches (2 400 mm) on center maximum for pipe 1-1/4 inches (32 mm) or larger and 72 inches (1 800 mm) on center maximum for pipe 1-1/8 inch (29 mm) or less.
         2) Support thermoplastic pipe at 48 inches (1 200 mm) on center maximum.
         3) Support PEX pipe at 32 inches (800 mm) minimum on center.
         4) Provide support at each elbow. Install additional support as required.
      c. Supports for Vertical Piping:
         1) Place riser clamps at each floor or ceiling level.
         2) Securely support clamps by structural members, which in turn are supported directly from building structure.
         3) Provide clamps as necessary to brace pipe to wall.
      d. Insulate hangers for copper pipe from piping by means of at least two layers of Scotch 33 plastic tape.

END OF SECTION

SECTION 22 0719

PLUMBING PIPING INSULATION

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Furnish and install insulation on hot and cold water lines, fittings, valves, and accessories as described in Contract Documents.

B. Related Requirements:
   1. Section 22 1116: 'Domestic Water Piping'.

PART 2 - PRODUCTS

2.1 COMPONENTS

A. Manufacturers:
   1. Manufacturer Contact List:
      a. Armacell, Mebane, NC www.armaflex.com.
      b. Childers Products Co, Eastlake, OH www.fosterproducts.com.
      c. IMCOA, Youngsville, NC www.nomacokflex.com.
      d. Johns-Manville, Denver, CO www.jm.com.
      e. Knauf, Shelbyville, IN www.knauffiberglass.com.
      f. Manson, Brossard, PQ, Canada www.isolationmanson.com.
      g. Nomaco Inc, Yopungsville, NC www.nomacokflex.com.
      h. Owens-Corning, Toledo, OH www.owenscorning.com.
      i. Speedline Corp, Solon, OH www.speedlinepvc.com.

B. Materials:
   1. Above Grade Metal Piping:
      a. Insulation For Piping:
         1) Snap-on glass fiber or melamine foam pipe insulation, or heavy density pipe insulation with factory vapor jacket.
         2) Insulation Thickness:

Service Water Temperature	Pipe Sizes Up to 1-1/4 In	1-1/2 to 2 In	Over 2 In
170 - 180 Deg F	One In	1-1/2 In	2 In
140 - 160 Deg F	1/2 In	One In	1-1/2 In
45 - 130 Deg F	1/2 In	1/2 In	One In

Service Water Temperature	Pipe Sizes Up to 32 mm	38 to 50 mm	Over 50 mm
77 - 82 Deg C	25 mm	38 mm	50 mm
60 - 71 Deg C	13 mm	25 mm	38 mm
7 - 54 Deg C	13 mm	13 mm	25 mm

         3) Performance Standards. Fiberglas ASJ by Owens-Corning.
         4) Type One Acceptable Manufacturers:
            a) Childers Products.

b) Knauf.
c) Manson.
d) Owens-Corning.
e) Johns-Manville.
f) Equal as approved by Architect before bidding. See Section 01 6200.

b. Fitting, Valve, And Accessory Covers:
1) PVC.
2) Performance Standard: Zeston by Johns-Manville.
3) Type One Acceptable Manufacturers:
a) Knauf.
b) Speedline.
c) Johns-Manville.
d) Equal as approved by Architect before bidding. See Section 01 6200.

2. Below Grade Metal Piping:
a. Insulation:
1) 1/2 inch (13 mm) thick.
2) Category Four Acceptable Products. See Section 01 6200 for definition of Categories:
a) SS Tubolit by Armacell.
b) ImcoLock by Imcoa.
c) Nomalock or Therma-Cel by Nomaco.

b. Joint Sealant:
1) Category Four Acceptable Products. See Section 01 6200 for definition of Categories:
a) Armacell 520.
b) Nomaco K-Flex R-373.

3. Pex Piping, Above And Below Grade:
a. Insulation:
1) 1/2 inch (13 mm) thick.
2) Category Four Acceptable Products. See Section 01 6200 for definition of Categories:
a) SS Tubolit by Armacell.
b) ImcoLock by Imcoa.
c) Nomalock or Therma-Cel by Nomaco.

b. Joint Sealant:
1) Category Four Acceptable Products. See Section 01 6200 for definition of Categories:
a) Armacell 520.
b) Nomaco K-Flex R-373.
c)

PART 3 - EXECUTION

3.1 APPLICATION

A. Above Grade Piping:
1. Apply insulation to clean, dry piping with joints tightly butted.
2. Install insulation in manner to facilitate removal for repairs. Place sections or blocks so least possible damage to insulation will result from inspection or repairs of piping or equipment.
3. Piping up to 1-1/4 inch (32 mm) Diameter:
a. Adhere 'factory applied vapor barrier jacket lap' smoothly and securely at longitudinal laps with white vapor barrier adhesive.
b. Adhere 3 inch (76 mm) wide self-sealing butt joint strips over end joints.
4. Piping 1-1/2 inches (38 mm) Diameter And Larger:
a. Use broken-joint construction in application of two-layer covering.
b. Fill cracks and depressions with insulating cement mixed to thick plastic paste.
1) Apply by hand in several layers to make up total specified thickness.
2) Final layer shall have smooth uniform finish before application of covering.
5. Fittings, Valves, And Accessories:
a. Do not apply insulation over flanged joints or victaulic couplings until piping has been brought up to operating temperature and flange bolts have been fully tightened. Insulate valves so wheel, stem, and packing nut are exposed.

b. 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.

c. Piping Up To 1-1/4 Inch (32 mm) Diameter:
   1) Cover insulation with one piece fitting cover secured by stapling or taping ends to adjacent pipe covering.
   2) Alternate Method:
      a) Insulate fittings, valves, and accessories with one inch of insulating cement and vapor seal with two 1/8 inch (3 mm) wet coats of vapor barrier mastic reinforced with glass fabric extending 2 inches (50 mm) onto adjacent insulation.

d. Piping 1-1/2 inches (38 mm) To 2 Inches (50 mm):
   1) Insulate with hydraulic setting insulating cement or equal, to thickness equal to adjoining pipe insulation.
   2) Apply final coat of fitting mastic over insulating cement.

e. Piping 2-1/2 inch (64 mm) And Larger:
   1) Insulate with segments of molded insulation securely wired in place and coated with skim coat of insulating cement.
   2) Apply fitting mastic, fitting tape and finish with final coat of fitting mastic.

6. Pipe Hangers:
   a. Do not allow pipes to come in contact with hangers.
   b. Pipe Shield:
      1) Provide schedule 40 PVC by 6 inch (150 mm) long at each clevis and/or unistrut type hanger.
      2) Provide 16 ga (1.64 mm) by 6 inch (150 mm) long galvanized shields at each pipe hanger to protect pipe insulation from crushing by clevis hanger.
      3) Provide 22 ga (0.85 mm) by 6 inch (150 mm) long galvanized shield at each pipe hanger to protect insulation from crushing by Unistrut type hanger.
   c. At Pipe Hangers:
      1) Provide rigid calcium silicate insulation (100 psi (690 kPA) compressive strength) at least 2 inches (50 mm) beyond shield.

7. Protect insulation wherever leak from valve stem or other source might drip on insulated surface, with aluminum cover or shield rolled up at edges and sufficiently large in area and of shape that dripping will not splash on surrounding insulation.

B. Below Grade Piping:
   1. Slip underground pipe insulation onto pipe and seal butt joints.
   2. Where slip-on technique is not possible, slit insulation, apply to pipe, and seal seams and joints.

END OF SECTION

SECTION 22 1116

DOMESTIC WATER PIPING

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Perform excavating and backfilling required by work of this Section.
   2. Furnish and install potable water piping complete with necessary valves, connections, and accessories inside building and connect as described in Contract Documents.

B. Related Requirements:
   1. Section 22 0501: 'Common Piping Requirements'.
   2. Section 22 0719: 'Plumbing Piping Insulation'.

1.2 REFERENCES

A. Reference Standards:
   1. American National Standards Institute / American Society of Sanitary Engineers:
      a. ANSI/ASSE 1003-2009, 'Performance Requirements for Water Pressure Reducing Valves for Domestic Water Distribution Systems'.
      b. ANSI/ASSE 1017-2009, 'Performance Requirements for Temperature Actuated Mixing Valves for Hot Water Distribution Systems'.
      c. ANSI/ASSE 1070-2015, 'Performance Requirements for Water Temperature Limiting Devices'.
   2. American Water Works Association:
      a. AWWA C904-16, 'Cross-Linked Polyethylene (PEX) Pressure Pipe, 1/2 inch (12 mm) Through 3 inch (76 mm) for Water Service'.
   3. ASTM International:
      a. ASTM B88-16, 'Standard Specification for Seamless Copper Water Tube'.
      b. ASTM E84-18b, 'Standard Test Method for Surface Burning Characteristics of Building Materials'.
      c. ASTM F876-17, 'Standard Specification for Crosslinked Polyethylene (PEX) Tubing'.
      d. ASTM F877-18a, 'Standard Specification for Crosslinked Polyethylene (PEX) Hot- and Cold-Water Distribution Systems'.
      e. ASTM F1807-18a, 'Standard Specification for Metal Insert Fittings Utilizing a Copper Crimp Ring for SDR9 Cross-linked Polyethylene (PEX) Tubing and SDR9 Polyethylene of Raised Temperature (PE-RT) Tubing'.
      f. ASTM F2023-15, "Standard Test Method for Evaluating the Oxidative Resistance of Crosslinked Polyethylene (PEX) Tubing and Systems to Hot Chlorinated Water'.
      g. ASTM F2389-17a, 'Standard Specification for Pressure-rated Polypropylene (PP) Piping Systems'.
   4. CSA Group (Canadian Standards Association):
      a. CSA B137 Series-17, 'Thermoplastic Pressure Piping Compendium':
         I) B137.5, 'Crosslinked Polyethylene (PEX) tubing Systems for Pressure Applications'.
      b. CSA B356-10 (R2015), ' Water pressure reducing valves for domestic water supply systems'.
   5. NSF International Standard:
      a. NSF P171, 'Protocol for Chlorine Resistance of Plastic Piping Materials' (1999).
   6. NSF International Standard / American National Standards Institute:
      a. NSF/ANSI 14-2018, 'Plastic Piping System Components and Related Materials'.

b. NSF/ANSI 61-2017, 'Drinking Water System Components - Health Effects'.
c. NSF/ANSI 372-2016, 'Drinking Water System Components - Lead Content'.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Pre-Installation Conference:
1. Participate in pre-installation conference as specified in Section 03 3111.

1.4 SUBMITTALS

A. Action Submittals:
1. Samples:
a. PEX pipe fitting.

B. Informational Submittals:
1. Test And Evaluation Reports:
a. Written report of sterilization test.

1.5 QUALITY ASSURANCE

A. Regulatory Agency Sustainability Approvals:
1. Meet NSF International Standards for materials or products that come into contact with drinking water, drinking water treatment chemicals, or both for chemical contaminants and impurities that are indirectly imparted to drinking water from products, components, and materials used in drinking water systems.
2. California only: California Assembly Bill 1953 (AB1953) Compliant for Lead Free

1.6 WARRANTY

A. Manufacturer Warranty:
1. Manufacturer's Warranty covering property damage caused by defective product including renovation costs or replacement costs.

PART 2 - PRODUCTS

2.1 SYSTEMS

A. Manufacturers:
1. Manufacturer Contact List:
a. Aquatherm, Inc., Lindon, UT www.aquathermpipe.com.
b. Acorn Controls, City of Industry, CA www.acorneng.com
c. Cash Acme, Cullman, AL www.cashacme.com
d. Chicago Faucets, Des Plaines, IL, www.chicagofaucets.com.
e. Cla-Val Company, Costa Mesa, CA or Cla-Val Canada Ltd, Beamsville, ON www.cla-val.com.
f. Conbraco Industries Inc, Matthews, NC www.conbraco.com or Conbraco (Honeywell Ltd), Scarborough, ON (416) 293-8111.
g. Hammond Valve, New Berlin, WI www.hammondvalve.com.
h. Handy & Harmon Products Div, Fairfield, CT www.handyharmon.com or Handy and Harmon of Canada Ltd, Rexdale, ON (800) 463-1465 or (416) 675-1860.
i. Harris Products Group, Cincinnati, OH www.harrisproductsgroup.com.
j. Honeywell Inc, Minneapolis, MN www.honeywell.com.
k. Leonard Valve Co, Cranston, RI www.leonardvalve.com.

l. Milwaukee Valve Co, New Berlin, WI www.milwaukeevalve.com.
m. Nibco Inc, Elkhart, IN www.nibco.com.
n. Nupi Americas, Early Branch, SC www.nupiamericas.com.
o. Rehau, Leesburg, VA www.rehau-na.com.
p. Sloan Valve Co, Franklin Park, IL www.sloanvalve.com.
q. Spence Engineering Co, Walden, NY www.spenceengineering.com.
r. Symmons Industries, Braintree, MA www.symmons.com.
s. Uponor Inc, Apple Valley, MN www.uponor-usa.com.
t. Viega ProPress, Wichita, KS www.viega-na.com.
u. Watts Regulator Co, Andover, MA www.wattsreg.com.
v. Wilkins (Zurn Wilkins), Paso Robles, CA www.zurn.com.
w. Zurn PEX, Inc., Commerce, TX www.zurnpex.com.

B. Materials:
1. Design Criteria:
a. All drinking water products, components, and materials above and below grade used in drinking water systems must meet NSF International Standards for Lead Free.
b. No CPVC allowed.
2. Pipe:
a. Copper:
1) Above-Grade:
a) Meet requirements of ASTM B88, Type L.
2) Below-Grade:
a) Meet requirements of ASTM B88, Type K. 3/4 inch (19 mm) minimum under slabs.
b) 2 inches (50 mm) And Smaller: Annealed soft drawn.
c) 2-1/2 inches (64 mm) And Larger: Hard Drawn.
b. Cross-Linked Polyethylene (PEX):
1) Certified with NSF International against NSF Standards NSF/ANSI 14, NSF/ANSI 61, NSF/ANSI 372, and NSF P171 Protocol.
2) Copper tube size (CTS) outside dimensions and Standard Dimension Ratio (SDR) of 9.
3) Pressure rated for 160 psi (1.10 MPa) at 73 deg F (22.8 deg C), 100 psi (0.69 MPa) at 180 deg F (82 deg C), and 80 psi (0.552 MPa) at 200 deg F (93 deg C).
4) Marked with Manufacturer's name, design pressure and temperature ratings, and third party certification stamp for NSF-PW.
5) Manufactured by Engel or peroxide method (PEX-A) or by silane method (PEX-B).
6) Category Four Approved Products. See Section 01 6200 for definitions of Categories:
a) `Raupex by Rehau.
b) Wirsbo Aquapex by Uponor.
c) ViegaPEX by Viega.
d) Zurn PEX by Zurn PEX.
3. Fittings:
a. For Copper Pipe: Wrought copper.
b. For PEX Pipe:
1) Category Four Approved Products. See Section 01 6200 for definitions of Categories:
a) Everloc by Rehau.
b) Viega PEX Press Zero Lead Fittings with attached stainless steel sleeves or Viega PEX Press Radel-R Polymer with attached stainless steel sleeves by Viega.
c) ProPEX fittings by Uponor including EP flow-through multiport tees.
d) Zurn PEX XL, DZR and CR fittings.
4. Connections For Copper Pipe:
a. Above-Grade:
1) Sweat copper type with 95/5 or 96/4 Tin-Antimony solder, Bridgit solder, or Silvabrite 100 solder. Use only lead-free solder.
2) Viega ProPress System
b. Below Grade:
1) Brazed using following type rods:
a) Copper to Copper Connections:
(1) AWS Classification BCuP-4 Copper Phosphorus (6 percent silver).

(2) AWS Classification BCuP-5 Copper Phosphorus (15 percent silver).

2) Copper to Brass or Copper to Steel Connections: AWS Classification BAg-5 Silver (45 percent silver).
3) Do not use rods containing Cadmium.
4) Brazing Flux:
   a) Approved Products:
      (1) Stay-Silv white brazing flux by Harris Product Group.
      (2) High quality silver solder flux by Handy & Harmon.
5) Joints under slabs acceptable only if allowed by local codes.

5. Ball Valves:
   a. Use ball valves exclusively unless otherwise specified. Ball valves shall be by single manufacturer from approved list below.
   b. Valves shall be two-piece, full port for 150 psi (1.03 MPa) SWP.
      1) Operate with flow in either direction, suitable for throttling and tight shut-off.
      2) Body: Bronze, 150 psig (1.03 MPa) wsp at 350 deg F (177 deg C) and 400 psig (2.76 MPa) wog.
      3) Seat: Bubble tight at 100 psig (0.69 MPa) under water.
   c. Class One Quality Standard: Nibco T585 or S585.
      1) Equal by Conbraco 'Apollo,' Hammond, Milwaukee, or Watts.
6. Mixing Valve For Lavatories:
   a. Solid brass construction and CSA B125 certified.
   b. Includes integral check valves and inlet screen. Features advanced paraffin-based actuation technology.
   c. Flow of 5.7 GPM (21.58 LPM) with maximum 10 psi (69 kPA) pressure drop. Perform to minimum flow of 0.5 GPM (1.89 LPM) in accordance with ASSE 1070.
   d. Set for 110 deg F (43 deg C) Service.
   e. Match Construction Drawings for connection sizes.
   f. Class One Quality Standard: Powers LFLM495. See Section 01 6200.
   g. Acceptable Manufacturers: Acorn, Chicago Faucets, Leonard, Powers, Sloan, Symmons and Watts.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Locate cold water lines a minimum of 6 inches (150 mm) from hot water line.

3.2 FIELD QUALITY CONTROL

A. Field Tests:
   1. Before pipes are covered, test systems in presence of Architect/Engineer at 125 psig (0.86 MPa) hydrostatic pressure for four (4) hours and show no leaks.
   2. Disconnect equipment not suitable for 125 psig (0.86 MPa) pressure from piping system during test period.

3.3 CLEANING

A. Sterilize potable water system with solution containing 200 parts per million minimum of available chlorine and maintaining pH of 7.5 minimum. Introduce chlorinating materials into system in manner approved by Architect/Engineer. Allow sterilization solution to remain for twenty-four (24) hours and open and close valves and faucets several times during that time.

B. After sterilization, flush solution from system with clean water until residual chlorine content is less than 0.2 parts per million.

C. 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

SECTION 22 1313

FACILITY SANITARY SEWERS

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Furnish and install soil, waste, and vent piping systems within building as described in contract documents.
   2. Perform excavation and backfill required by work of this Section.

B. Related Requirements:
   1. Section 07 8400: 'Firestopping' for quality of firestopping material.
   2. Section 22 0501: 'Common Plumbing Requirements'.
   3. Section 22 1319: 'Facility Sanitary Sewer Specialties' for furnishing of sewer specialties.

1.2 ADMINISTRATIVE REQUIREMENTS

A. Pre-Installation Conference: Participate in pre-installation conference specified in Section 03 3111.

1.3 REFERENCES

A. Reference Standards:
   1. American National Standards Institute / American Water Works Association:
      a. ANSI/AWWA C110/A21.10-12, 'Ductile-Iron and Gray-Iron Fittings'.
      b. ANSI/AWWA C111/A21.11-17, 'Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings'.
      c. ANSI/AWWA C115/A21.15-11, 'Flanged Ductile-Iron Pipe with Ductile-Iron or Gray-Iron Threaded Flanges'.
      d. ANSI/AWWA C116/A21.16-15, 'Protective Fusion-Bonded Epoxy Coatings for the Interior and Exterior Surfaces of Ductile-Iron and Gray-Iron Fittings for Water Supply Service'.
      e. ANSI/AWWA C150/A21.50-14, 'Thickness Design of Ductile-Iron Pipe'.
      f. ANSI/AWWA C151/A21.51-17, 'Ductile-Iron Pipe, Centrifugally Cast, for Water'.
      g. ANSI/AWWA C153/A21.53-11, 'Ductile-Iron Compact Fittings for Water Service'.
   2. American Water Works Association (AWWA):
      a. AWWA M41, 'Ductile-Iron Pipe and Fittings' (3rd Edition).
   3. ASTM International:
      a. ASTM A74-17, 'Standard Specification for Cast Iron Soil Pipe and Fittings'.
      b. ASTM A888-18a, 'Standard Specification for Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste, and Vent Piping Applications'.
      c. ASTM C564-14, 'Standard Specification for Rubber Gaskets for Cast Iron Soil Pipe and Fittings'.
      d. ASTM D2235-04(2016), 'Standard Specification for Solvent Cement for Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe and Fittings'
      e. ASTM D2321-18, 'Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications'.
      f. ASTM D2564-12(2018), 'Standard Specification for Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Piping Systems'.
      g. ASTM D3034–16, 'Standard Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings'.
      h. ASTM F628–12, 'Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) Schedule 40 Plastic Drain, Waste, and Vent Pipe With a Cellular Core'.

i. ASTM F656–15, 'Standard Specification for Primers for Use in Solvent Cement Joints of Poly (Vinyl Chloride) (PVC) Plastic Pipe and Fittings'.
j. ASTM F891–16, 'Standard Specification for Coextruded Poly(Vinyl Chloride) (PVC) Plastic Pipe With a Cellular Core'.

4. Cast Iron Soil Pipe Institute:
   a. CISPI Standard 301-09, 'Standard Specification for Hubless Cast Iron Soil Pipe End Fittings for Sanitary & Storm Drain, Waste, and Vent Piping Applications'.
   b. CISPI 310-11, 'Standard Specification for Couplings for use in connection with Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste, and Vent Piping Applications.
   c. CISPI Handbook. 'Cast Iron Soil Pipe and Fittings Handbook' (2006).
5. International Code Council:
   a. ICC IPC-2018, 'International Plumbing Code'.

PART 2 - PRODUCTS

2.1 SYSTEMS

A. Manufacturers:
   1. Manufacturer Contact List.
      a. American Brass & Iron (AB&I), Oakland, CA www.abifoundry.com.
      b. Clamp-All Corp, Haverhill, MA www.clampall.com.
      c. Anaco-Husky, Corona, CA www.anaco-husky.com.
      d. Josam Co, Michigan City, IN www.josam.com.
      e. Jay R. Smith Manufacturing Co, Montgomery, AL www.jrsmith.com.
      f. MG Piping Products Co, Stanton, CA www.mgcoupling.com.
      g. Mifab Manufacturing Inc, Chicago, IL www.mifab.com.
      h. Mission Rubber Co., Corona, CA www.missionrubber.com.
      i. Wade Div Tyler Pipe, Tyler, TX www.wadedrains.com.
      j. Watts Drainage, Spindale, NC www.watts.com or Watts Industries, Burlington, ON, Canada www.wattscda.com.
      k. Zurn Cast Metals, Erie, PA or Zurn Industries Limited, Mississauga, ON www.zurn.com.

B. Performance:
   1. Design Criteria:
      a. Minimum size of waste piping installed under floor slab on grade shall be 2 inches (50 mm).
      b. Meet requirements of CAN/CSA-B70 for cast iron piping systems and CAN/CSA-B182.1 for plastic piping systems.

C. Materials:
   1. Piping And Fittings: PVC Schedule 40 cellular core plastic pipe and pipe fittings meeting requirements of ASTM F891, joined using cement primer meeting requirements of ASTM F656 and pipe cement meeting requirements of ASTM D2564.
      a. Furnish wall cleanouts with chrome wall cover and screw.
   2. Piping And Fittings: ABS Schedule 40 cellular core plastic pipe and pipe fittings meeting requirements of ASTM F628, joined with pipe cement meeting requirements of ASTM D2235.
      a. Furnish wall cleanouts with chrome wall cover and screw.
   3. Buried Piping:
      a. Approved Types: Service weight, single-hub or no-hub type cast iron soil pipe meeting requirements of ASTM A74.
      b. Joint Material:
         1) Single-Hub: Rubber gaskets meeting requirements of ASTM C564.
         2) No-Hub:
            a) Category Four Approved Products. See Section 01 6200 for definitions of Categories:
            b) American Brass & Iron: SuperGrip 304.
            c) Anaco-Husky: Husky SD 4000 coupling.

d) Clamp-All: Neoprene gaskets with type 304 stainless steel clamp and 24 ga type 304 stainless steel housing.
e) Mission Rubber: Heavy weight coupling.
f) MG Piping: MG Coupling.
g) Mifab: MI-XHUB – Heavy duty shielded coupling type 301 or 304 stainless steel.

4. Above Grade Piping And Vent Lines:
   a. Approved Types:
      1) Service weight, single-hub or no-hub type cast iron soil pipe meeting requirements of ASTM A74.
      2) Vent lines 2-1/2 inches (64 mm) or smaller may be Schedule 40 galvanized steel.
   b. Joint Material:
      1) Single-Hub: Rubber gaskets meeting requirements of ASTM C564.
      2) No-Hub Pipe: Neoprene gaskets with stainless steel cinch bands.
5. Fittings:
   a. Cast Iron Pipe: Hub and spigot, except fittings for no-hub pipe shall be no-hub, and meet requirements of ASTM A74.
      1) Joint Material: Rubber gaskets meeting requirements of ASTM C564.
      2) Galvanized Pipe: Screwed Durham tarred drainage type.
   b. Traps installed on cast iron bell and spigot pipe shall be service weight cast iron. Traps installed on threaded pipe shall be recess drainage pattern type.
   c. P-Traps:
      1) Trap shall have clean out plug if installed in other than slab on grade.
      2) Type Two Acceptable Products.
         a) JR Smith: 7220 deep seal cast iron.
         b) Mifab: MI-950.
         c) Zurn: Zurn Z-1000.
         d) Equal as approved by Architect before installation. See Section 01 6200.
6. Cleanouts:
   a. Furnish wall cleanouts with chrome wall cover and screw.
   b. Type Two Acceptable Products:
      1) Finish Floors:
         a) Josam: 56010.
         b) J. R. Smith: 4023.
         c) Mifab: C1100C-R-1.
         d) Wade: W-6000.
         e) Watts: CO-200-R.
         f) Zurn: Z-1402.
      2) Resilient Flooring:
         a) Josam: 56010-12.
         b) J. R. Smith: 4140.
         c) Mifab: C1100C-T-1.
         d) Wade: W-6000-T.
         e) Watts: CO-200-T.
         f) Zurn: Z-1400.
      3) Finished Wall:
         a) Josam: 58790.
         b) J. R. Smith: 4530.
         c) Mifab: C1460RD.
         d) Wade: W8560E.
         e) Watts: CO-460-RD.
         f) Zurn: Z-1446.
      4) Exposed Drain Lines:
         a) Josam: 58910.
         b) J. R. Smith: 4510.
         c) Mifab: C1460.
         d) Wade: W8560B.
         e) Watts: CO-460.
         f) Zurn: Z-1440.
      5) General Purpose:
         a) Josam: 58900.

b) J. R. Smith: 4400.
c) Mifab: C1300-MF
d) Wade: W8550E.
e) Watts: CO-380.
f) Zurn: Z-1440.

6) Equal as approved by Architect before installation. See Section 01 6200.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Excavate and backfill as specified in Sections 31 2316 and 31 2323 with following additional requirements:
1. Runs shall be as close as possible to those shown on Drawings.
2. Excavate to required depth and grade to obtain fall required. Grade soil and waste lines within building perimeter 1/4 inch (6 mm) fall in one foot (300 mm) in direction of flow.
3. Bottom of trenches shall be hard. Tamp as required.
4. Remove debris from trench before laying of pipe.
5. Do not cut trenches near footings without consulting Architect.

B. Thermoplastic Pipe And Fittings:
1. General: Piping and joints shall be clean and installed according to Manufacturer's recommendations. Break down contaminated joints, clean seats and gaskets and reinstall.
2. Above Grade: Locate pipe hangers every 4 feet (1.2 m) on center maximum and at elbows.
3. Below Grade:
   a. Install in accordance with Manufacturer's recommendations and ASTM D2321.
   b. Stabilize unstable trench bottoms.
   c. Bed pipe true to line and grade with continuous support from firm base.
      1) Bedding depth: 4 to 6 inches (100 to 150 mm).
      2) Material and compaction to meet ASTM standard noted above.
   d. Excavate bell holes into bedding material so pipe is uniformly supported along its entire length. Blocking to grade pipe is forbidden.
   e. Trench width at top of pipe:
      1) Minimum: 18 inches (450 mm) or diameter of pipe plus 12 inches (300 mm), whichever is greater.
      2) Maximum: Outside diameter of pipe plus 24 inches (600 mm).
   f. Do not use backhoe or power equipment to assemble pipe.
   g. Initial backfill shall be 12 inches (300 mm) above top of pipe with material specified in referenced ASTM standard.
   h. Minimum cover over top of pipe not under building slab:
      1) 36 inches (900 mm) before wheel loading.
      2) 48 inches (1 200 mm) before compaction.

C. Install piping so cleanouts may be installed as follows.
1. At every 135 degrees of accumulative change in direction for horizontal lines.
2. Every 100 feet (30 meters) of horizontal run.
3. Extend piping to accessible surface. Do not install piping so cleanouts must be installed in carpeted floors. In such locations, configure piping so wall type cleanouts may be used.

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 siphon condition on water seal.

E. Vent entire waste system to atmosphere. Join lines together in fewest practicable numbers before projecting above roof. Set back vent lines so they will not pierce roof near edge or valley. Vent line terminations shall be:

1. 6 inches (150 mm) minimum above roof and 12 inches (300 mm) minimum from any vertical surface.
2. Same size as vent pipe.
3. In areas where minimum design temperature is below 0 deg F (minus 18 deg C) or where frost or snow closure may be possible:
   a. Vent line terminations shall be same size as vent pipe, except no smaller than 2 inches (50 mm) in diameter.
   b. Vents shall terminate 10 inches (250 mm) minimum above roof or higher if required by local codes.

F. Furnish and install firestopping at penetrations of fire-rated structures as required under Sections 07 8400 and 22 0501.

G. If test Tees are used for testing, plug Tees so wall finish can be installed. Do not leave as exposed cleanouts.

3.2 FIELD QUALITY CONTROL

A. Field Tests:
   1. Conduct tests for leaks and defective work. Notify Architect before testing.
   2. Metal Pipe System: After backfilling and compacting of trenches is complete but before placing floor slab, fill waste and vent system with water to roof level or 10 feet (3 meters) minimum, and show no leaks for two hours. Uncover pipe and correct leaks and defective work. Re-backfill and compact and re-test.
   3. Thermoplastic Pipe System:
      a. Before backfilling and compacting of trenches, Fill waste and vent system with water to roof level or 10 feet (3 meters) minimum, and show no leaks for two hours. Correct leaks and defective work.
      b. After backfilling and compacting of trenches is complete but before placing floor slab, re-test as specified above. Uncover pipe and correct leaks and defective work. Re-backfill and compact and re-test.

END OF SECTION

SECTION 22 4213

COMMERCIAL WATER CLOSETS AND URINALS

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Furnish and install plumbing fixtures as described in Contract Documents.

B. Related Requirements:
   1. Section 07 9213: 'Elastomeric Joint Sealants' for sealants used between fixtures and other substrates.
   2. Section 22 0501: 'Common Plumbing Requirements'.
   3. Section 22 1116: 'Domestic Water Piping'.

1.2 REFERENCES

A. Definitions:
   1. High-Efficiency Toilet (HET): Toilets with effective flush volume of 1.28 gallons (4.8 liters) or less.
   2. Maximum Performance (MaP): Toilet testing that rates toilet efficiency and flush performance by measuring number of grams of solid waste (soybean paste and toilet paper) that a toilet can flush and remove completely from fixture in single flush represented as a scale or score. 1000 grams is highest score possible (www.map-testing.com).

B. Reference Standards:
   1. American Society of Mechanical Engineers / CSA Group (Canadian Standards Association):
      a. ASME A112.19.2-2018/CSA B45.1-18, 'Ceramic Plumbing Fixtures'.

1.3 SUBMITTALS

A. Closeout Submittals:
   1. Include following in Operations And Maintenance Manual specified in Section 01 7800:
      a. Operation and Maintenance Data:
         1) Sensor Operated operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 ASSEMBLIES

A. Manufacturers:
   1. Manufacturer Contact List:
      a. American Standard Brands, Piscataway, NJ www.americanstandard-us.com or American Standard Canada, Mississauga, ON www.americanstandard.ca.
      b. AMTC - Advanced Modern Technologies Corp, Woodland Hills, CA www.amtcorporation.com.
      c. Bemis Manufacturing Co, Sheboygan Falls, WI www.bemismfg.com.
      d. Beneke by Sanderson Plumbing Products, Columbus, MS www.sppi.com.
      e. Church Seat Co, Sheboygan Falls WI www.churchseats.com.
      f. Delany Flush Valves, Charlottesville, VA www.delanyproduct.com.

g. Delta Faucet Co, Indianapolis, IN www.deltafaucet.com or Delta Faucet Canada, London, ON (519) 659-3626.
h. Dearborn Brass, Cleveland, OH www.dearbornbrass.com.
i. Gerber Plumbing Fixtures LLC, Woodridge, IL www.gerberonline.com.
j. Josam Co, Michigan City, IN www.josam.com.
k. Jay R. Smith Mfg. Co, Montgomery, AL www.jrsmith.com.
l. Kohler Co Plumbing Div, Kohler, WI www.us.kohler.com.
m. McGuire Manufacturing Co. Cheshire, CT www.mcguiremfg.com
n. Mifab Manufacturing Inc, Amherst, NY www.mifab.com.
o. Moen Incorporated, North Olmsted, OH, or Moen Canada, Oakville, ON www.moen.com.
p. Olsonite Corp, Newnan, GA www.olsonite.net or Olsonite Co Ltd, Tilbury, ON (519) 682-1240.
q. Sloan Valve Co, Franklin Park, IL www.sloanvalve.com.
r. South Fork Manufacturing, Coalville, UT (801) 953-3001 www.dirt-grabber.com.
s. Toto U.S.A., Inc., Morrow, GA www.totousa.com
t. Wade Div Tyler Pipe, Tyler, TX www.wadedrains.com.
u. Watts Drainage, Spindale, NC www.wattsdrainage.com or Watts Industries, Burlington, ON, Canada www.wattscda.com.
v. Zurn Industries, LLC, Erie PA www.zurn.com. or Zurn Industries Ltd, Mississuaga, ON (905) 795-8844.

B. Performance:
1. Design Criteria:
a. Meet or exceed ASME A112.19.2/CSA B45.1 for Vitreous China Plumbing Fixtures.
b. Interior exposed pipe, valves, and fixture trim, including trim behind custom casework doors, shall be chrome plated.
c. All materials NOT required to be low lead compliant.
d. Do not use toilets with effective flush volume of less than 1.28 gallons (4.8 liters).

C. Materials:
1. Water Closets:
a. Floor Mounted With Tank:
1) Standard Fixture
a) Water usage of 1.6 gallons (6 liters) per flush.
b) MaP Score of 1000 grams.
c) Category Four Approved Products. See Section 01 6200 for definitions of Categories:
(1) American Standard: Cadet 3 Elongated 215CA.004.
(2) Gerber: Avalanche AV-21-812.
(3) Kohler: Wellworth K-3978.
(4) Toto: 'Drake' CST744S.
2) Handicap Accessible Fixture:
a) Water usage of 1.6 gallons (6 liters) per flush.
b) 18 inch (450 mm) maximum rim height.
c) MaP Score of 1000 grams.
d) Category Four Approved Products. See Section 01 6200 for definitions of Categories:
(1) American Standard: Cadet 3 Right Height Elongated 215AA.004.
(2) Gerber: Avalanche AV-21-818.
(3) Kohler: Highline K-3979.
(4) Toto: 'ADA Drake' CST744SL.
2. Water Closet Accessories:
a. Seats:
1) Provide split front type with check hinge.
2) Category Four Approved Products. See Section 01 6200 for definitions of Categories:
a) Standard And Handicap Accessible Fixtures:
(1) American Standard: 5905.100SS.
(2) Bemis: 1655SSC.
(3) Beneke: 527 SS.
(4) Church: 9500SSC.

(5) Kohler: K-4731-C.
(6) Olsonite: 95SSC.
(7) Toto SC534.

b. Supply Pipe And Stop:
1) Provide chrome plated quarter-turn brass ball valve, 12 inch (300 mm) braided stainless steel riser, and chrome-plated steel flange.
2) Category Four Approved Products. See Section 01 6200 for definitions of Categories.
a) McGuire: BV2166CC.
b) Zurn: Z8804.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install each fixture with separate vent line. Do not circuit vent.

B. Ensure provisions are made for proper support of fixtures and that rough-in piping is accurately set and protected from movement and damage.
1. Seal wall-mounted fixtures around edges to wall with sealant specified in Section 07 9213 'Elastomeric Joint Sealants'.
2. Attach wall-hung fixtures to carriers.
3. Support fixture hanger or arm free of finished wall.

C. Adjust flush valves for proper flow.

D. Provide each individual fixture supply with accessible chrome-plated stop valve with hand wheel.

E. Water Closets:
1. Floor Fixtures:
a. Make fixture connections with approved brand of cast iron flange, soldered or caulked securely to waste pipe. Make joints between fixtures and flanges tight with approved fixture setting compound or gaskets. Caulk between fixtures with sealant specified in Section 07 9213. Point edges.

3.2 CLEANING

A. Polish chrome finish at completion of Project.

END OF SECTION

SECTION 22 4216

COMMERCIAL LAVATORIES AND SINKS

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Furnish and install plumbing fixtures as described in Contract Documents.

B. Related Requirements:
   1. Section 07 9213: 'Elastomeric Joint Sealants' for sealants used between fixtures and other substrates.
   2. Section 22 0501: 'Common Plumbing Requirements'.
   3. Section 22 1116: 'Domestic Water Piping'.

1.2 REFERENCES

A. Reference Standard:
   1. American National Standards Institute / International Code Council:
      a. ANSI/ICC A117.1-2017, 'Standard for Accessible and Usable Buildings and Facilities'.
   2. American Society of Mechanical Engineers / Canadian Standards Association (CSA Group):
      a. ASME A112.18.1-2018/CSA B125.1-18, 'Plumbing Supply Fittings'.
      b. ASME A112.19.1-2018/CSA B45.2-18, 'Enamelled Cast Iron and Enamelled Steel Plumbing Fixtures'.
      c. ASME A112.19.3-2017/CSA B45.4-17, 'Stainless steel plumbing fixtures'.
   3. CSA Group (Canadian Standards Association):
      a. CSA B125.1-18/ASME A112.18.1-2018, 'Plumbing Supply Fittings'.
      b. CSA B45.2-18/ASME A112.19.1-2018, 'Enamelled Cast Iron and Enamelled Steel Plumbing Fixtures'.
      c. CSA B45.4-17/ASME A112.19.3-2017, 'Stainless Steel Plumbing Fixtures'.
   4. NSF International Standard / American National Standards Institute:
      a. NSF/ANSI 61-2017, 'Drinking Water System Components - Health Effects'.
      b. NSF/ANSI 372-2016, 'Drinking Water System Components - Lead Content'.

1.3 QUALITY ASSURANCE

A. Regulatory Agency Sustainability Approvals:
   1. Meet NSF International Standards for materials or products that come into contact with drinking water, drinking water treatment chemicals, or both for chemical contaminants and impurities that are indirectly imparted to drinking water from products, components, and materials used in drinking water systems.
   2. California only: California Assembly Bill 1953 (AB1953) Compliant for Lead Free.

1.4 SUBMITTALS

A. Closeout Submittals:
   1. Include following in Operations And Maintenance Manual specified in Section 01 7800:
      a. Warranty Documentation:
         1) Final, executed copy of Warranty.

1.5 WARRANTY

A. Manufacturer Warranty:
   1. Manufacturer's standard Warranty against material or Manufacturing defects.

PART 2 - PRODUCTS

2.1 ASSEMBLIES

A. Manufacturers:
   1. Manufacturer Contact List:
      a. American Standard Brands, Piscataway, NJ www.americanstandard-us.com or American Standard Canada, Mississauga, ON www.americanstandard.ca.
      b. Brocar Products Inc, Cincinnati, OH www.brocar.com.
      c. CECO, Huntington Park, CA www.cecosinks.com.
      d. Chicago Faucet Co, Des Plaines, IL www.chicagofaucets.com.
      e. Dearborn Brass, Tyler, TX www.dearbornbrass.com.
      f. Delta Faucet Co, Indianapolis, IN www.deltafaucet.com or Delta Faucet Canada, London, ON (519) 659-3626.
      g. Engineered Brass Co. (EBC) (Just Manufacturing Co.), Franklin Park, IL www.justmfg.com.
      h. Elkay Manufacturing Co, Oak Brook, IL www.elkay.com.
      i. Gerber Plumbing Fixtures LLC, Woodridge, IL www.gerberonline.com.
      j. Josam Co, Michigan City, IN www.josam.com.
      k. Jay R. Smith Maufacturing Co, Montgomery, AL www.jrsmith.com.
      l. Just Manufacturing Co, Franklin Park, IL www.justsinks.com.
      m. Keeney Manufacturing Co, Newington, CT www.keeneymfg.com.
      n. Kindred USA, Midland, ON www.kindred-sinkware.com.
      o. Kohler Co Plumbing Div, Kohler, WI www.us.kohler.com.
      p. McGuire Manufacturing Co, Cheshire, CT www.mcguiremfg.com.
      q. Mifab Manufacturing Inc, Amherst, NY www.mifab.com.
      r. Moen Incorporated, North Olmsted, OH, or Moen Canada, Oakville, ON www.moen.com.
      s. Omni Flow Controls, Harbor City, CA www.chronomite.com or www.omniflowcontrols.com.
      t. Plumberex Specialty Products, Palm Springs, CA www.plumberex.com.
      u. Sloan Valve Co, Franklin Park, IL www.sloanvalve.com.
      v. Speakman Company, New Castle, DE www.speakmancompany.com.
      w. Symmons, Braintree, MA www.symmons.com.
      x. T & S Brass & Bronze Works Inc, Travelers Rest, SC www.tsbrass.com.
      y. TrueBro Inc, Collierville, TN www.truebro.com.
      z. Wade Div Tyler Pipe, Tyler, TX www.wadedrains.com.
      aa. Watts Drainage, Spindale, NC www.wattsdrainage.com or Watts Industries, Burlington, ON, Canada www.wattscda.com.
      bb. Zurn Commercial Brass, Sanford, NC www.zurn.com or Zurn Industries Ltd, Mississuaga, ON (905) 795-8844.
      cc. Zurn Cast Metal, Erie, PA www.zurn.com.

B. Performance:
   1. Design Criteria:
      a. Interior exposed pipe, valves, and fixture trim, including trim behind custom casework doors, shall be chrome plated.
      b. Faucets and other fixture fittings shall conform to requirements of ASME A112.18.1/CSA B125.1.
      c. Lavatories shall conform to requirements of:
         1) Enamelled cast iron and enamelled steel fixtures
            a) ASME A112.19.1/CSA B45.2.
            b) CSA B45.2/ASME A112.19.1.
         2) Stainless steel plumbing fixtures:
            a) ASME A112.19.3/CSA B45.4.

b) CSA B45.4/ASME A112.19.3.

C. Components:
1. Lavatories And Fittings:
a. Standard and Handicap Accessible Counter Top Lavatories:
1) Size 20 by 17 inches (500 by 430 mm) nominal.
2) Category Four Approved Products. See Section 01 6200 for definitions of Categories:
a) American Standard: Aqualyn 0476.028.
b) Gerber: Luxoval 12-844.
c) Kohler: Pennington K-2196-4N.
b. Standard and Handicap Accessible Self Supporting Lavatories:
1) Size: 20 by 18 inches (500 by 450 mm) nominal.
2) Category Four Approved Products. See Section 01 6200 for definitions of Categories:
a) American Standard: Lucern 0355.012.
b) Kohler: Greenwich K-2032.
3) Carrier / Support:
a) Category Four Approved Products. See Section 01 6200 for definitions of Categories:
(1) Josam: 17100.
(2) Jay R. Smith: 0700.
(3) Mifab: MC-41.
(4) Wade: 520-M36.
c. Lavatory Fittings:
1) Faucet and Grid Strainer For Standard Sinks:
a) Design Criteria:
(1) Meet NSF International Standards for Lead Free.
b) Category Four Approved Products. See Section 01 6200 for definitions of Categories:
(1) American Standard: Monterrey Two-Handle Centerset Lavatory Faucet with Vandal-Resistant Wrist Blade handles and grid strainer drain 5502.170.
(2) Chicago: 802CP with 327XCP.
(3) Delta: 2529HDF.
(4) Gerber: C4-44-412.
(5) Kohler: K-7404-5A with K-7715 strainer.
(6) Moen: 8215 with 14750 grid strainer.
(7) Speakman: SC 3072.
(8) T & S: B-0890 with B-0899 Grid Strainer.
(9) Zurn: Z81104 with McGuire 155A Grid Strainer.
2) Faucet and Grid Strainer For Handicap Accessible Sinks:
a) Design Criteria:
(1) Meet NSF International Standards for Lead Free.
b) Category Four Approved Products. See Section 01 6200 for definitions of Categories:
(1) American Standard: Monterrey Two-Handle Centerset Lavatory Faucet with Vandal-Resistant Wrist Blade handles and grid strainer drain 5502.170.
(2) Chicago: 802-317CP with K7715 strainer.
(3) Delta: 2529HDF.
(4) Gerber: CO-44-412.
(5) Kohler: K-7404-5A with K-13885 strainer.
(6) Moen: 8215 with14750 grid strainer.
(7) Speakman: SC 3074.
(8) T & S: B-0890 with B-0899 Grid Strainer.
(9) Zurn: Z-81104 with McGuire 155A grid strainer.
3) Flow Control Fitting:
a) Design Criteria:
(1) Meet NSF International Standards for Lead Free.
b) Accessories:
(1) Provide vandal-proof type in place of aerator. Flow shall be 0.5 gpm.
c) Category Four Approved Product. See Section 01 6200 for definitions of Categories:

(1) Omni L-200 Series by Chronomite Laboratories.

4) Supply pipes with stops:
   a) Design Criteria:
      (1) Meet NSF International Standards for Lead Free.
   b) Accessories:
      (1) Provide chrome plated quarter-turn brass ball valve, 12 inches (305 mm) long braided stainless steel riser, and chrome-plated steel flange.
   c) Category Four Approved Products. See Section 01 6200 for definitions of Categories:
      (1) McGuire: BV2165CC.
      (2) Zurn: Z8804 LRQ-PC.
5) Trap:
   a) Description:
      (1) 17 gauge (1.4 mm) tube 'P' trap, chrome plated.
   b) Design Criteria:
      (1) Not required to meet NSF International Standards for Lead Free.
   c) Category Four Approved Products. See Section 01 6200 for definitions of Categories:
      (1) Dearborn.
      (2) Engineered Brass Company (EBC).
      (3) Keeney Manufacturing.
      (4) McGuire.
      (5) Zurn.
6) Safety Covers for Handicap Accessible Lavatories:
   a) Description:
      (1) Provide protection on water supply pipes and on trap.
   b) Design Criteria:
      (1) Not required to meet NSF International Standards for Lead Free.
   c) Category Four Approved Products. See Section 01 6200 for definitions of Categories:
      (1) Trapwrap by Brocar Products Inc.
      (2) Pro Wrap by McGuire Products.
      (3) Lav Guard 2 by TrueBro.
      (4) Pro Extreme by Plumberex.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install each fixture with separate vent line. Do not circuit vent.

B. Ensure provisions are made for proper support of fixtures and that rough-in piping is accurately set and protected from movement and damage.

C. Seal wall-mounted fixtures around edges to wall and counter top fixtures to countertop with sealant specified in Section 07 9213.

D. Unless otherwise noted, provide each individual fixture supply with chrome-plated stop valve with hand wheel.

E. Install fixtures with accessible stop or control valve in each hot and cold water branch supply line.

F. Self-Supporting Lavatories: Install using carriers. Support carrier free of finished wall.

G. Install Safety Covers on all under sink / lavatories with exposed water supply pipes and traps.

H. Install Handicap Accessible Lavatories as per ADA height mounting requirements.

3.2 CLEANING

A. Polish chrome finish at completion of Project.

END OF SECTION

END OF DIVISION 22

DIVISION 23: HEATING, VENTILATING, AND AIR-CONDITIONING

END OF TABLE OF CONTENTS

SECTION 23 0501

COMMON HVAC REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Common requirements and procedures for HVAC systems.
   2. Responsibility for proper operation of electrically powered equipment furnished under this Division.
   3. Interface with Testing And Balancing Agency.
   4. Furnish and install sealants relating to installation of systems installed under this Division.
   5. Furnish and install Firestop Penetration Systems for HVAC system penetrations as described in Contract Documents.
   6. Furnish and install sound, vibration, and seismic control elements.

B. Products Furnished But Not Installed Under This Section:
   1. Sleeves, inserts, and equipment for mechanical systems installed under other Sections.

C. Related Requirements:
   1. Section 07 8400: 'Firestopping' for quality of Penetration Firestop Systems to be used on Project and submittal requirements.
   2. Section 07 9213: 'Elastometric Joint Sealant' for quality of sealants used at building exterior.
   3. Section 07 9219: 'Acoustical Joint Sealants' for quality of acoustical sealants.
   4. Sections Under 09 9000 Heading: Painting of mechanical items requiring field painting.
   5. Division 26: Raceway and conduit, unless specified otherwise, line voltage wiring, outlets, and disconnect switches.
   6. Slots and openings through floors, walls, ceilings, and roofs provided under other Divisions in their respective materials.

1.2 SUBMITTALS

A. Action Submittals:
   1. Product Data:
      a. Manufacturer's catalog data for each manufactured item.
         1) Provide section in submittal for each type of item of equipment. Include Manufacturer's catalog data of each manufactured item and enough information to show compliance with Contract Document requirements. Literature shall show capacities and size of equipment used and be marked indicating each specific item with applicable data underlined.
         2) Include name, address, and phone number of each supplier.
   2. Shop Drawings:
      a. Schematic control diagrams for each separate fan system, heating system, control panel, etc. Each diagram shall show locations of all control and operational components and devices. Mark correct operating settings for each control device on these diagrams.
      b. Diagram for electrical control system showing wiring of related electrical control items such as firestats, fuses, interlocks, electrical switches, and relays. Include drawings showing electrical power requirements and connection locations.
      c. Drawing of each temperature control panel identifying components in panels and their function.
      d. Other shop drawings required by Division 23 trade Sections.

B. Closeout Submittals:
1. Include following in Operations And Maintenance Manual specified in Section 01 7800:
a. Operations and Maintenance Data (Modify and add to requirements of Section 01 7800):
1) At beginning of HVAC section of Operations And Maintenance Manual, provide master index showing items included.
a) Provide name, address, and phone number of Architect, Architect's Mechanical Engineer, General Contractor, and HVAC, Sheet Metal, Refrigeration, and Temperature Control subcontractors.
b) Identify maintenance instructions by using same equipment identification used in Contract Drawings. Maintenance instructions shall include:
(1) List of HVAC equipment used indicating name, model, serial number, and nameplate data of each item together with number and name associated with each system item.
(2) Manufacturer's maintenance instructions for each piece of HVAC equipment installed in Project. Instructions shall include name of vendor, installation instructions, parts numbers and lists, operation instructions of equipment, and maintenance and lubrication instructions.
(3) Summary list of mechanical equipment requiring lubrication showing name of equipment, location, and type and frequency of lubrication.
(4) Manual for Honeywell T7350 thermostat published by Honeywell.
c) Provide operating instructions to include:
(1) General description of each HVAC system.
(2) Step by step procedure to follow in putting each piece of HVAC equipment into operation.
(3) Provide diagrams for electrical control system showing wiring of items such as smoke detectors, fuses, interlocks, electrical switches, and relays.
b. Warranty Documentation:
1) Include copies of warranties required in individual Sections of Division 23.
c. Record Documentation:
1) Manufacturers documentation:
a) Copies of approved shop drawings.

1.3 QUALITY ASSURANCE

A. Regulatory Agency Sustainability Approvals:
1. Perform work in accordance with applicable provisions of Gas Ordinances applicable to Project. Provide materials and labor necessary to comply with rules, regulations, and ordinances.
2. In case of differences between building codes, laws, local ordinances, utility company regulations, and Contract Documents, the most stringent shall govern. Notify Architect in writing of such differences before performing work affected by such differences.
3. Identification:
a. Motor and equipment name plates as well as applicable UL / ULC and AGA / CGA labels shall be in place when Project is turned over to Owner.

B. Qualifications: Requirements of Section 01 4301 applies, but not limited to following:
1. Company:
a. Company specializing in performing work of this section.
1) Minimum five (5) years experience in HVAC installations.
2) Minimum five (5) satisfactorily completed installations in past three (3) years of projects similar in size, scope, and complexity required for this project before bidding.
b. Upon request, submit documentation.
2. Installer:
a. Licensed for area of Project.
b. Designate one (1) individual as project foremen who shall be on site at all times during installation and experienced with installation procedures required for this project.
c. Upon request, submit documentation.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Delivery And Acceptance Requirements:
   1. Accept valves on site in shipping containers with labeling in place.

B. Storage And Handling Requirements:
   1. In addition to requirements specified in Division 01:
      a. Stored material shall be readily accessible for inspection by Architect until installed.
      b. Store items subject to moisture damage, such as controls, in dry, heated spaces.
      c. Provide temporary protective coating on cast iron and steel valves.
      d. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.
   2. Protect bearings during installation. Thoroughly grease steel shafts to prevent corrosion.

1.5 WARRANTY

A. Manufacturer Warranty:
   1. Provide certificates of warranty for each piece of equipment made out in favor of Owner. Clearly record 'start-up' date of each piece of equipment on certificate.

B. Special Warranty:
   1. Guarantee HVAC systems to be free from noise in operation that may develop from failure to construct system in accordance with Contract Documents.
   2. If HVAC sub-contractor with offices located more than 150 miles (240 km) from Project site is used, provide service / warranty work agreement for warranty period with local HVAC sub-contractor approved by Architect. Include copy of service / warranty agreement in warranty section of Operation And Maintenance Manual.

PART 2 - PRODUCTS

2.1 COMPONENTS

A. Components shall bear Manufacturer's name and trade name. Equipment and materials of same general type shall be of same make throughout work to provide uniform appearance, operation, and maintenance.

B. Pipe And Pipe Fittings:
   1. Use domestic made pipe and pipe fittings on Project.
   2. Weld-O-Let and Screw-O-Let fittings are acceptable.

C. Sleeves:
   1. In Framing: Standard weight galvanized iron pipe, Schedule 40 PVC, or 14 ga (2 mm) galvanized sheet metal two sizes larger than bare pipe or insulation on insulated pipe.
   2. In Concrete And Masonry: Sleeves through outside walls, interior shear walls, and footings shall be schedule 80 black steel pipe with welded plate.

D. Valves:
   1. Valves of same type shall be of same manufacturer.

PART 3 - EXECUTION

3.1 INSTALLERS

A. Acceptable Installers:
   1. Meet Quality Assurance Installer Qualifications as specified in Part 1 of this specification.

3.2 EXAMINATION

A. Drawings:
   1. HVAC Drawings show general arrangement of piping, ductwork, equipment, etc. Follow as closely as actual building construction and work of other trades will permit.
   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 HVAC Drawings.
   3. Because of small scale of Drawings, it is not possible to indicate all offsets, fittings, and accessories that 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.

B. Verification Of Conditions:
   1. Examine premises to understand conditions that may affect performance of work of this Division before submitting proposals for this work. Examine adjoining work on which mechanical work is dependent for efficiency and report work that requires correction.
   2. No subsequent allowance for time or money will be considered for any consequence related to failure to examine site conditions.
   3. Ensure 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. If approval is received by Addendum or Change Order to use other than originally specified items, be responsible for specified capacities and for ensuring that items to be furnished will fit space available.
   4. Check that slots and openings provided under other Divisions through floors, walls, ceilings, and roofs are properly located. Perform cutting and patching caused by neglecting to coordinate with Divisions providing slots and openings at no additional cost to Owner.

3.3 PREPARATION

A. Changes Due To Equipment Selection:
   1. Where equipment specified or otherwise approved requires different arrangement or connections from that shown in Contract Documents, submit drawings, if requested by Architect, showing proposed installations.
   2. If proposed changes are approved, install equipment to operate properly and in harmony with intent of Contract Documents. Make incidental changes in piping, ductwork, supports, installation, wiring, heaters, panelboards, and as otherwise necessary.
   3. Provide any additional motors, valves, controllers, fittings, and other additional equipment required for proper operation of system resulting from selection of equipment.
   4. Be responsible for the proper location of roughing-in and connections provided under other Divisions.

3.4 INSTALLATION

A. Interface With Other Work:

1. Furnish sleeves, inserts, supports, and equipment that are to be installed by others in sufficient time to be incorporated into construction as work proceeds. Locate these items and see they are properly installed.
2. Electrical: Furnish exact location of electrical connections and complete information on motor controls to installer of electrical system.
3. Testing And Balancing:
   a. Put HVAC systems into full operation and continue their operation during each working day of testing and balancing.
   b. Make changes in pulleys, belts, fan speeds, and dampers or add dampers as required for correct balance as recommended by Testing And Balancing Agency and at no additional cost to Owner.

B. Cut carefully to minimize necessity for repairs to previously installed or existing work. Do not cut beams, columns, or trusses.

C. Locating Equipment:
   1. Arrange pipes, ducts, and equipment to permit ready access to valves, cocks, unions, traps, filters, starters, motors, control components, and to clear openings of doors and access panels.
   2. Adjust locations of pipes, ducts, switches, panels, and equipment to accommodate work to interferences anticipated and encountered.
   3. Install HVAC work to permit removal of equipment and parts of equipment requiring periodic replacement or maintenance without damage to or interference with other parts of equipment or structure.
   4. Determine exact route and location of each pipe and duct before fabrication.
      a. Right-Of-Way:
         1) Lines that pitch shall have right-of-way over those that do not pitch. For example, steam, steam condensate, and drains shall normally have right-of-way.
         2) Lines whose elevations cannot be changed shall have right-of-way over lines whose elevations can be changed.
      b. Offsets, Transitions, and Changes in Direction:
         1) Make offsets, transitions, and changes in direction in pipes and ducts as required to maintain proper head room and pitch of sloping lines whether or not indicated on Drawings.
         2) Furnish and install all traps, air vents, sanitary vents, and devices as required to effect these offsets, transitions, and changes in direction.

D. Piping:
   1. Furnish and install complete system of piping, valved as indicated or as necessary to completely control entire apparatus.
      a. 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 Division from responsibility for proper erection of systems of piping in every respect.
      b. Arrange piping to not interfere with removal of other equipment, ducts, or devices, or block access to doors, windows, or access openings.
         1) Arrange so as to facilitate removal of tube bundles.
         2) Provide accessible flanges or ground joint unions, as applicable for type of piping specified, at connections to equipment and on bypasses.
            a) Make connections of dissimilar metals with di-electric unions.
            b) Install valves and unions ahead of traps and strainers. Provide unions on both sides of traps.
         3) Do not use reducing bushings, street elbows, bull head tees, close nipples, or running couplings.
         4) Install piping systems so they may be easily drained. Provide drain valves at low points and manual air vents at high points in hot water heating and cooling water piping.
         5) Install piping to insure noiseless circulation.
         6) Place valves and specialties to permit easy operation and access. Valves shall be regulated, packed, and glands adjusted at completion of work before final acceptance.
      c. Do not install piping in shear walls.
   2. Properly make adequate provisions for expansion, contraction, slope, and anchorage.

a. Cut piping accurately for fabrication to measurements established at site. Remove burr and cutting slag from pipes.
b. Work piping into place without springing or forcing. Make piping connections to pumps and other equipment without strain at piping connection. Remove bolts in flanged connections or disconnect piping to demonstrate that piping has been so connected, if requested.
c. Make changes in direction with proper fittings.
d. Expansion of Thermoplastic Pipe:
1) Provide for expansion in every 30 feet (9 meters) of straight run.
2) Provide 12 inch (300 mm) offset below roof line in each vent line penetrating roof.

3. Provide sleeves around pipes passing through concrete or masonry floors, walls, partitions, or structural members. Do not place sleeves around soil, waste, vent, or roof drain lines passing through concrete floors on grade. Seal sleeves with specified sealants.
a. Sleeves through floors shall extend 1/4 inch (6 mm) above floor finish in mechanical equipment rooms above basement floor. In other rooms, sleeves shall be flush with floor.
b. Sleeves through floors and foundation walls shall be watertight.
4. Provide spring clamp plates (escutcheons) where pipes run through walls, floors, or ceilings and are exposed in finished locations of building. Plates shall be chrome plated heavy brass of plain pattern and shall be set tight on pipe and to building surface.
5. Remove dirt, grease, and other foreign matter from each length of piping before installation.
a. After each section of piping used for movement of water or steam is installed, flush with clean water, except where specified otherwise.
b. Arrange temporary flushing connections for each section of piping and arrange for flushing total piping system.
c. Provide temporary cross connections and water supply for flushing and drainage and remove after completion of work.

E. Penetration Firestops: Install Penetration Firestop System appropriate for penetration at HVAC system penetrations through walls, ceilings, roofs, and top plates of walls.

F. Sealants:
1. Seal openings through building exterior caused by penetrations of elements of HVAC systems.
2. Furnish and install acoustical sealant to seal penetrations through acoustically insulated walls and ceilings.

3.5 REPAIR / RESTORATION

A. 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.
1. Patch and repair walls, floors, ceilings, and roofs with materials of same quality and appearance as adjacent surfaces unless otherwise shown.
2. Surface finishes shall exactly match existing finishes of same materials.

3.6 FIELD QUALITY CONTROL

A. Field Tests:
1. Perform tests on HVAC piping systems. Furnish devices required for testing purposes.

B. Non-Conforming Work:
1. Replace material or workmanship proven defective with sound material at no additional cost to Owner.
2. Repeat tests on new material, if requested.

3.7 SYSTEM START-UP

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 seven 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. Preparations that are to be completed before start up and operation include, but are not limited to, following:
1. Dry out electric motors and other equipment to develop and properly maintain constant insulation resistance.
2. Make adjustments to insure that:
   a. Equipment alignments and clearances are adjusted to allowable tolerances.
   b. Nuts and bolts and other types of anchors and fasteners are properly and securely fastened.
   c. Packed, gasketed, and other types of joints are properly made up and are tight and free from leakage.
   d. Miscellaneous alignings, tightenings, and adjustings are completed so systems are tight and free from leakage and equipment performs as intended.
3. Motors and accessories are completely operable.
4. Inspect and test electrical circuitry, connections, and voltages to be properly connected and free from shorts.
5. Adjust drives for proper alignment and tension.
6. Make certain filters in equipment for moving air are new and of specified type.
7. Properly lubricate and run-in bearings in accordance with Manufacturer's directions and recommendations.

3.8 CLEANING

A. Clean exposed piping, ductwork, and equipment.

B. No more than one week before Final Inspection, flush out bearings and clean other lubricated surfaces with flushing oil. Provide best quality and grade of lubricant specified by Equipment Manufacturer.

C. Replace filters in equipment for moving air with new filters of specified type no more than one week before Final Inspection.

3.9 CLOSEOUT ACTIVITIES

A. Instruction Of Owner:
1. Instruct building maintenance personnel and Stake Physical Facilities Representative in operation and maintenance of mechanical systems utilizing Operation And Maintenance Manual when so doing:
   a. Minimum Instruction Periods:
      1) HVAC: Eight (8) hours.
      2) Temperature Control: Six (6) hours.
      3) Refrigeration: Four (4) hours.
   b. Conduct instruction periods after Substantial Completion inspection when systems are properly working and before final payment is made. None of these instructional periods shall overlap another.

3.10 PROTECTION

A. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system. 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.

B. Do not operate pieces of equipment used for moving supply air without proper air filters installed properly in system.

C. After start-up, continue necessary lubrication and be responsible for damage to bearings while equipment is being operated up to Substantial Completion.

END OF SECTION

SECTION 23 3114

LOW-PRESSURE METAL DUCTS

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Furnish and install above-grade low-pressure steel ducts and related items as described in Contract Documents.

B. Related Requirements:
   1. Section 23 3001: 'Common Duct Requirements'.

1.2 REFERENCES

A. Association Publications:
   1. Sheet Metal And Air Conditioning Contractors' National Association / American National Standards Institute:
   2. SMACNA, 'HVAC Duct Construction Standards - Metal and Flexible' (4th edition).

B. Reference Standards:
   1. ASTM International:
      a. ASTM A653/A653M-18, 'Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process'.
      b. ASTM E84-18b, 'Standard Test Method for Surface Burning Characteristics of Building Materials'.
   2. Underwriters Laboratories, Inc.:
      a. UL 723: 'Standard for Safety Test for Surface Burning Characteristics of Building Materials'; (11th Edition - 2018).
   3. Underwriters Laboratories of Canada:
      a. ULC 102-18: 'Method of Test for Surface Burning Characteristics of Building Materials and Assemblies' (ULC S102).

1.3 QUALITY ASSURANCE

A. Regulatory Agency Sustainability Approvals:
   1. Duct Sealer:
      a. Meet Class A flame spread rating in accordance with ASTM E84 or UL 723.
      b. Meet Class A flame spread rating in accordance with ULC-S102.2.
      c. Handle, store, and apply materials in compliance with applicable regulations and material safety data sheets (MSDS).

1.4 DELIVERY, STORAGE, AND HANDLING

A. Storage and Handling Requirements:
   1. Duct Sealer:
      a. Handle, store, and apply materials in compliance with applicable regulations and material safety data sheets (MSDS).
      b. Handle to prevent inclusion of foreign matter, damage by water, or breakage.

c. Store in a cool dry location, but never under 35 deg F (1.7 deg C) or subjected to sustained temperatures exceeding 110 deg F (43 deg C) or as per Manufacturer's written recommendations.
d. Do use sealants that have exceeded shelf life of product.

1.5 FIELD CONDITIONS

A. Ambient Conditions:
1. Duct Sealer:
a. Do not apply under 35 deg F (1.7 deg C) or subjected to sustained temperatures exceeding 110 deg F (43 deg C) or as per Manufacturer's written recommendations.
b. Do not apply when rain or freezing temperatures will occur within seventy two (72) hours.

PART 2 - PRODUCTS

2.1 SYSTEM

A. Materials:
1. Sheet Metal:
a. Fabricate ducts, plenum chambers and casings of zinc-coated, lock-forming quality steel sheets meeting requirements A653/A653M, with G 60 coating.
2. Duct Sealer For Interior Ducts:
a. Category Four Approved Products. See Section 01 6200 for definitions of Categories:
1) Duct Butter or ButterTak by Cain Manufacturing Co Inc, Pelham, AL www.cainmfg.com.
2) DP 1010, DP 1030 or DP 1015 by Design Polymerics, Fountain Valley, CA www.designpoly.com.
3) PROseal, FIBERseal, EVERseal, or EZ-seal by Ductmate Industries, Inc., Charleroi, PA www.ductmate.com.
4) SAS by Duro Dyne, Bay Shore, NY or Duro Dyne Canada, Lachine, QB www.durodyne.com.
5) Iron Grip 601 by Hardcast Inc. Wylie, TX www.hardcast.com.
6) MTS100 or MTS 200 by Hercules Mighty Tough, Denver CO, www.herculesindustries.com.
7) 15-325 by Miracle / Kingco, Div ITW TACC, Rockland, MA www.taccint.com.
8) 44-39 by Mon-Eco Industries Inc, East Brunswick, NJ www.mon-ecoindustries.com.
9) Airseal Zero by Polymer Adhesive Sealant Systems Inc, Weatherford, TX www.polymeradhesives.com.
10) Airseal #22 Water Base Duct Sealer by Polymer Adhesive Sealant Systems Inc. Weatherford, TX www.polymeradhesives.com.

B. Fabrication:
1. General:
a. Straight and smooth on inside with joints neatly finished.
b. Duct drops to diffusers shall be round, square, or rectangular to accommodate diffuser neck. Drops shall be same gauge as branch duct. Seal joints air tight.
2. Standard Ducts:
a. General:
1) Ducts shall be large enough to accommodate inside acoustic duct liner. Dimensions shown on Drawings are net clear inside dimensions after duct liner has been installed.
b. Rectangular Duct:
1) Duct panels through 48 inch (1 200 mm) dimension having acoustic duct liner need not be cross-broken or beaded. Cross-break unlined ducts, duct panels larger than 48 inch (1 200 mm) vertical and horizontal sheet metal barriers, duct offsets, and elbows, or bead 12 inches (300 mm) on center.

a) Apply cross-breaking to sheet metal between standing seams or reinforcing angles.
b) Center of cross-break shall be of required height to assure surfaces being rigid.
c) Internally line square and rectangular drops. Externally insulate round drops.

2) Duct with height or width over 36 inches (900 mm) shall be fabricated using SMACNA T-24 flange joints or of pre-fabricated systems as follows:
a) Ducts with sides over 36 inches (900 mm) up to 48 inches (1 200 mm): Transverse duct joint system by Ductmate / 25, Elgen, Ward, or WDCI (SMACNA Class 'F' joint).
b) Ducts 48 inch (1 200 mm) And Larger: Ductmate / 35, Elgen, or WDCI (SMACNA Class 'J' transverse joint).
c) Category Four Approved Products. See Section 01 6200 for definitions of Categories:
(1) Ductmate Industries Inc, Charleroi, PA www.ductmate.com or Ductmate Canada Ltd, Burlington, ON (905) 332-7678.
(2) Ward Industries Inc, Bensonville, IL www.wardind.com.
(3) Elgen Manufacturing Company, Inc., East Ruterford, NJ www.elgenmfg.com.

c. Round Duct:
1) Spiral Seam:
a) 28 ga (0.38 mm) minimum for ducts up to and including 14 inches (355 mm) in diameter.
b) 26 ga (0.46 mm) minimum for ducts over 14 inches (355 mm) and up to and including 26 inches (660 mm) in diameter.
2) Longitudinal Seam:
a) 28 ga (0.38 mm) minimum for ducts up to and including 8 inches (200 mm) in diameter.
b) 26 ga (0.46 mm) minimum for ducts over 8 inches (200 mm) and up to 14 inches (355 mm) in diameter.
c) 24 ga (0.61 mm) minimum for ducts over 14 inches (355 mm) up to and including 26 inches (660 mm) in diameter.

PART 3 - EXECUTION

3.1 PREPARATION

A. Metal duct surface must be clean and free of moisture, contamination and foreign matter before applying duct sealer for interior and exterior ducts.

3.2 INSTALLATION

A. Install internal ends of slip joints in direction of flow. Seal transverse and longitudinal joints air tight using specified duct sealer as per Manufacturer's written instructions. Cover horizontal and longitudinal joints on exterior ducts with two layers of specified tape installed with specified adhesive.

B. Securely anchor ducts and plenums to building structure with specified duct hangers attached with screws. Do not hang more than one duct from a duct hanger. Brace and install ducts so they shall be free of vibration under all conditions of operation.

C. Ducts shall not bear on top of structural members.

D. Paint ductwork visible through registers, grilles, and diffusers flat black.

E. Properly flash where ducts protrude above roof.

F. Under no conditions will pipes, rods, or wires be allowed to penetrate ducts.

3.3 FIELD QUALITY CONTROL

A. Field Tests:
   1. Air Test and Balance Testing as specified in Section 01 4546: 'Duct Testing, Adjusting, and Balancing'.

B. Non-Conforming Work:
   1. Reseal transverse joint duct leaks and seal longitudinal duct joint leaks discovered during air test and balance procedures at no additional cost to Owner.

END OF SECTION

SECTION 23 3401

EXHAUST FANS

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Furnish and install new exhaust fans for new toilet room as described in Contract Documents.

B. Related Requirements:
   1. Section 23 3001: 'Common Duct Requirements'.
   2. Division 26: Control device and electrical connection.

1.2 QUALITY ASSURANCE

A. Regulatory Agency Sustainability Approvals:
   1. Bear AMCA seal and UL label.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturer Contact List:
   1. Acme Engineering & Manufacturing Corp, Muskogee, OK www.acmefan.com.
   2. Broan-Nu Tone LLC, Harford, WI www.broan.com.
   3. Carnes Co., Verona, MI www.carnes.com.
   4. Loren Cook Co., Springfield, MO www.lorencook.com.
   5. Soler & Palau (S&P USA Ventilation Systems, LLC), Jacksonville FL www.solerpalau-usa.com.

2.2 MANUFACTURED UNITS

A. Ceiling Mounted Exhaust Fans:
   1. Acoustically insulated housings. Sound level rating of 5.0 sones maximum for CFM and static pressure listed on Contract Drawings.
   2. Include chatterproof integral back-draft damper with no metal-to-metal contact.
   3. True centrifugal wheels.
   4. Entire fan, motor, and wheel assembly shall be easily removable without disturbing housing.
   5. Suitably ground motors and mount on rubber-in shear vibration isolators.
   6. Provide wall or roof cap, as required.
   7. Category Four Approved Products. See Section 01 6200 for definitions of Categories.
      a. Acme: VQ.
      b. Broan: LoSone.
      c. Carnes: VCD.
      d. Cook: Gemini.
      e. Soler & Palau: FF.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Anchor fan units securely to structure or to curb.

END OF SECTION

END OF DIVISION 23

DIVISION 26: ELECTRICAL

SECTION 26 0501

COMMON ELECTRICAL REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. General electrical system requirements and procedures.
   2. Perform excavating and backfilling work required by work of this Division as described in Contract Documents.
   3. Make electrical connections to equipment provided under other Sections.
   4. Furnish and install Penetration Firestop Systems at electrical system penetrations as described in Contract Documents.

B. Products Furnished But Not Installed Under This Section:
   1. Anchor bolts and templates for exterior lighting equipment bases.

C. Related Requirements:
   1. Section 07 8400: 'Firestopping' for quality of Penetration Firestop Systems to be used on Project and submittal requirements.
   2. Section 31 2316: 'Excavation' for criteria for performance of excavating.
   3. Section 31 2323: 'Fill' for criteria for performance of backfilling.

1.2 REFERENCES

A. Reference Standards:
   1. National Fire Protection Association / American National Standards Institute:
      a. NFPA 70, 'National Electrical Code (NEC)' (2017 or most recent edition adopted by AHJ).
   2. National Electrical Manufacturing Association Standards (NEMA):
      a. NEMA 250-2018, 'Enclosure for Electrical Equipment (1000 Volts Maximum)'.

1.3 SUBMITTALS

A. Action Submittals:
   1. Product Data:
      a. Provide following information for each item of equipment:
         1) Catalog Sheets.
         2) Assembly details or dimension drawings.
         3) Installation instructions.
         4) Manufacturer's name and catalog number.
         5) Name of local supplier.
         6) Section 26 2726: 'Wiring Devices' for lighting control and dimmer equipment.
         7) Section 26 5100: 'Interior Lighting Fixtures'.
      b. Do not purchase equipment before approval of product data.
   2. Shop Drawings:
      a. Submit on Panelboards:
      b. Indicate precise equipment to be used, including all options specified. Indicate wording and format of nameplates where applicable. Submit in three-ring binder with hard cover.

B. Informational Submittals:
   1. Test And Evaluation Reports:
      a. Report of site tests, before Substantial Completion.

2. Qualification Statement:
   a. Electrical Subcontractor:
      1) Provide Qualification documentation if requested by Architect or Owner.
   b. Installer:
      1) Provide Qualification documentation if requested by Architect or Owner.

C. Closeout Submittals:
   1. Include following in Operations And Maintenance Manual specified in Section 01 7800:
      a. Operations and Maintenance Data:
         1) Provide operating and maintenance instructions for each item of equipment submitted under Product Data.
      b. Record Documentation:
         1) Manufacturers documentation:
            a) Manufacturer's literature.
            b) Include copy of approved shop drawings.

1.4 QUALITY ASSURANCE

A. Regulatory Agency Sustainability Approvals:
   1. NEC and local ordinances and regulations shall govern unless more stringent requirements are specified.
   2. Material and equipment provided shall meet standards of NEMA or UL and bear their label wherever standards have been established and label service is available.
   3. Material and equipment provided shall meet standards of NEMA or UL, or ULC, CSA, or EEMAC and bear their label wherever standards have been established and label service is available.

B. Qualifications: Requirements of Section 01 4301 applies, but not limited to following:
   1. Electrical Subcontractor:
      a. Company specializing in performing work of this section.
         1) Minimum five (5) years experience in electrical installations.
         2) Minimum five (5) satisfactorily completed installations in past three (3) years of projects similar in size, scope, and complexity required for this project before bidding.
      b. Upon request, submit documentation.
   2. Installer:
      a. Licensed for area of Project.
      b. Designate one (1) individual as project foremen who shall be on site at all times during installation and experienced with installation procedures required for this project.
      c. Upon request, submit documentation.

PART 2 - PRODUCTS

2.1 SYSTEMS

A. Performance:
   1. Design Criteria:
      a. Materials and equipment provided under following Sections shall be by same Manufacturer:
         1) Section 26 2417: Panelboards.

PART 3 - EXECUTION

3.1 INSTALLERS

A. Acceptable Installers:
   1. Meet Quality Assurance Installer Qualifications as specified in Part 1 of this specification.

3.2 EXAMINATION

A. Verification Of Conditions:
   1. Confirm dimensions, ratings, and specifications of equipment to be installed and coordinate these with site dimensions and with other Sections.

3.3 INSTALLATION

A. General:
   1. Locations of electrical equipment shown on Drawings are approximate only. Field verify actual locations for proper installation.
   2. Coordinate electrical equipment locations and conduit runs with those providing equipment to be served before installation or rough in.
      a. Notify Architect of conflicts before beginning work.
      b. Coordinate locations of power and lighting outlets in mechanical rooms and other areas with mechanical equipment, piping, ductwork, cabinets, etc, so they will be readily accessible and functional.
   3. Work related to other trades which is required under this Division, such as cutting and patching, trenching, and backfilling, shall be performed according to standards specified in applicable Sections.

B. Install Penetration Firestop System appropriate for penetration at electrical system penetrations through walls, ceilings, and top plates of walls.

3.4 FIELD QUALITY CONTROL

A. Field Tests:
   1. Test systems and demonstrate equipment as working and operating properly. Notify Architect before test. Rectify defects at no additional cost to Owner.
   2. Measure current for each phase of each motor under actual final load operation, i.e. after air balance is completed for fan units, etc. Record this information along with full-load nameplate current rating and size of thermal overload unit installed for each motor.

3.5 CLOSEOUT ACTIVITIES

A. Training:
   1. Provide competent instructor for three (3) days to train Owner's maintenance personnel in operation and maintenance of electrical equipment and systems. Factory representatives shall assist this instruction as necessary. Schedule instruction period at time of final inspection.

END OF SECTION

SECTION 26 0519

LINE-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Quality of conductors used on Project except as excluded below.

B. Related Requirements:
   1. Section 23 0933: 'Electric and Electronic Control System for HVAC' for conductors and cables for temperature control system.
   2. Section 26 0501: 'Common Electrical Requirements'.

1.2 REFERENCES

A. Definitions:
   1. Line Voltage: Over 70 Volts.

B. Reference Standards:
   1. National Fire Protection Association:
      a. NFPA 70, 'National Electric Code (NEC)' (2017 or most recent edition adopted by AHJ including all applicable amendments and supplements).
         1) Article 334, "Nonmettalic-Sheathed Cable, Types NM, NMC And NMS'.

PART 2 - PRODUCTS

2.1 SYSTEMS

A. Line Voltage Conductors:
   1. Copper with AWG sizes as shown:
      a. Minimum size shall be No. 12 except where specified otherwise.
      b. Conductor size No. 8 and larger shall be stranded.
   2. Insulation:
      a. Standard Conductor Size No. 10 And Smaller: 600V type THWN or XHHW (75 deg F (24 deg C)).
      b. Standard Conductor Size No. 8 And Larger: 600V Type THW, THWN, or XHHW (75 deg F (24 deg C)).
      c. Higher temperature insulation as required by NFPA 70 or local codes.
   3. Colors:
      a. 208Y / 120 V System:
         1) Black: Phase A.
         2) Red: Phase B.
         3) Blue: Phase C.
         4) Green: Ground.
         5) White: Neutral.
      b. Conductors size No. 10 and smaller shall be colored full length. Tagging or other methods for coding of conductors size No. 10 and smaller not allowed.
      c. For feeder conductors larger than No. 10 at pull boxes, gutters, and panels, use painted or taped band or color tag color-coded as specified above.

B. Line Voltage Cables:
   1. Non-Metallic Sheathed Cable (NM) and Metal Clad Cable (MC) may be used as restricted below:
      a. Copper conductors.
      b. Sizes #12 through #8.
      c. Use only in indoor dry locations where:
         1) Not subject to damage.
         2) Not in contact with earth.
      d. Not in concrete.
      e. Not where exposed or not concealed.
      f. Not over suspended ceilings.
      g. As restricted by NFPA 70 Article 334
   2. Metal Clad Cable (MC) may be used as restricted below:
      a. Copper conductors.
      b. Sizes #12 through #8.
      c. Use only in indoor dry locations where:
         1) Not subject to damage.
         2) Not in contact with earth.
         3) Not in concrete.

C. Standard Connectors:
   1. Conductors No. 8 And Smaller: Steel spring wire connectors.
   2. Conductors Larger Than No. 8: Pressure type terminal lugs.
   3. Connections Outside Building: Watertight steel spring wire connections with waterproof, non-hardening sealant.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General:
   1. Conductors and cables shall be continuous from outlet to outlet.
   2. Do not use direct burial cable.

B. Line Voltage Conductors:
   1. Install conductors in raceway where indicated on Contract Drawings. Run conductors of different voltage systems in separate conduits.
   2. Route circuits at own discretion, however, circuiting shall be as shown in Panel Schedules. Group circuit homeruns to panels as shown on Contract Drawings.
   3. Neutrals:
      a. On three-phase, 4-wire systems, do not use common neutral for more than three circuits.
      b. On single-phase, 3-wire systems, do not use common neutral for more than two circuits.
      c. Run separate neutrals for each circuit where specifically noted on Contract Drawings.
      d. Where common neutral is run for two or three home run circuits, connect phase conductors to breakers in panel which are attached to separate phase legs:
         1) Provide breaker tie so that all circuits that share common neutral are simultaneously disconnected.
         2) Neutral conductors shall be of same size as phase conductors unless specifically noted otherwise.
   4. Pulling Conductors:
      a. Do not pull conductors into conduit until raceway system is complete and cabinets and outlet boxes are free of foreign matter and moisture.
      b. Do not use heavy mechanical means for pulling conductors.
      c. Use only listed wire pulling lubricants.

C. Line Voltage Cables:
   1. Route circuits at own discretion, however, circuiting and numbering shall be as shown in Panel Schedules.

2. Support cables using approved staples, cable ties, straps, hangers, or similar fittings, spaced as required.
3. Where installing in framing, do not bore holes in joists or beams outside center 1/3 of member depth or within 24 inches (600 mm) of bearing points. Do not bore holes in vertical framing members outside center 1/3 of member width. Holes shall be one inch diameter maximum.
4. Conceal cables within ceilings and walls of finished areas. Cables may be exposed in unfinished areas but not run on floors of mechanical equipment spaces or in such a way that they obstruct access to, operation of, or servicing of equipment.
5. Install exposed cables parallel to or at right angles to building structure lines.
6. Keep cables 6 inches (150 mm) minimum from hot water pipes.
7. Do not support cables from mechanical ducts or duct supports without Architect's written approval.
8. Prohibited procedures:
   a. Boring holes for installation of cables in vertical truss members.
   b. Notching of structural members for installation of cables.

END OF SECTION

SECTION 26 0533

RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Quality of material and installation procedures for raceway, boxes, and fittings used on Project but furnished under other Divisions.
   2. Furnish and install raceway, conduit, and boxes used on Project not specified to be installed under other Divisions.

B. Related Requirements:
   1. See Section 07 8400: 'Firestopping' for raceways penetrating fire rated walls, ceilings, and barriers'.
   2. Section 26 0501: 'Common Electrical Requirements' for general electrical requirements'.

1.2 REFERENCES

A. Reference Standards:
   1. National Fire Protection Association:
      a. NFPA 70, 'National Electric Code (NEC)' (2017 or most recent edition adopted by AHJ including all applicable amendments and supplements).

PART 2 - PRODUCTS

2.1 SYSTEM

A. Manufacturers:
   1. Manufacturer Contact List:
      a. Cooper B-Line, Highland, IL www.b-line.com.
      b. Hubbell Incorporated, Milford, CT www.hubbell-wiring.com or Hubbell Canada Inc, Pickering, ON (905) 839-4332.
      c. Square D, Palatine, IL www.squared.com.
      d. Thomas & Betts, Memphis, TN www.tnb.com or Thomas & Betts Ltd, Iberville, PQ (450) 347-5318.
      e. Walker Systems Inc, Williamstown, WV (800) 240-2601 or Walker Systems Inc / Wiremold Canada Inc, Fergus, ON (519) 843-4332.
      f. Wiremold Co, West Hartford, CT www.wiremold.com.

B. Materials:
   1. Raceway And Conduit:
      a. Sizes:
         1) 3/4 inch (19 mm) for exterior use, unless indicated otherwise.
         2) 1/2 inch (13 mm) for interior use, unless indicated otherwise.
      b. Types: Usage of each type is restricted as specified below by product.
         1) Galvanized rigid steel or galvanized intermediate metal conduit (IMC) is allowed for use in all areas. Where in contact with earth or concrete, wrap buried galvanized rigid steel and galvanized IMC conduit and fittings completely with vinyl tape.
         2) Galvanized Electrical Metallic Tubing (EMT), Flexible Steel Conduit, and Electrical Non-Metallic Tubing (ENT):

a) Allowed for use only in indoor dry locations where it is:
(1) Not subject to damage.
(2) Not in contact with earth.
(3) Not in concrete.
b) For metal conduit systems, flexible steel conduit is required for final connections to indoor mechanical equipment.

3) Galvanized Electrical Metallic Tubing (EMT) and Flexible Steel Conduit:
a) Allowed for use only in indoor dry locations where it is:
(1) Not subject to damage.
(2) Not in contact with earth.
(3) Not in concrete.
b) For metal conduit systems, flexible steel conduit is required for final connections to indoor mechanical equipment.

4) Schedule 40 Polyvinyl Chloride (PVC) Conduit:
a) Allowed for use only underground or below concrete with galvanized rigid steel or IMC elbows and risers.

5) Listed, Liquid-Tight Flexible Metal Conduit:
a) Use in outdoor final connections to mechanical equipment, length not to exceed 36 inches (900 mm).

6) Pre-wired 3/8 Inch (9.5 mm) Flexible Fixture Whips: Allowed only for connection to recessed lighting fixtures, lengths not to exceed 72 inches (1 800 mm).

c. Prohibited Raceway Materials:
1) Aluminum conduit.
2) Armored cable type AC (BX) cable.

2. Raceway And Conduit:
a. Sizes:
1) 3/4 inch (19 mm) for exterior use, unless indicated otherwise.
2) 1/2 inch (13 mm) for interior use, unless indicated otherwise.

b. Types: Usage of each type is restricted as specified below by product.
1) Galvanized rigid steel or galvanized intermediate metal conduit (IMC) is allowed for use in all areas. Where in contact with earth or concrete, wrap buried galvanized rigid steel and galvanized IMC conduit and fittings completely with vinyl tape.
2) Galvanized Electrical Metallic Tubing (EMT), Flexible Steel Conduit, and Metal Clad Cable (MC):
a) Allowed for use only in indoor dry locations where it is:
(1) Not subject to damage.
(2) Not in contact with earth.
(3) Not in concrete.
b) For metal conduit systems, flexible steel conduit is required for final connections to indoor mechanical equipment.
3) Schedule 40 Polyvinyl Chloride (PVC) Conduit:
a) Allowed for use only underground or below concrete with galvanized rigid steel or IMC elbows and risers.
4) Listed, Liquid-Tight Flexible Metal Conduit:
a) Use in outdoor final connections to mechanical equipment, length not to exceed 36 inches (900 mm).
5) Pre-wired 3/8 Inch (9.5 mm) Flexible Fixture Whips: Allowed only for connection to recessed lighting fixtures, lengths not to exceed 72 inches (1 800 mm).

c. Prohibited Raceway Materials:
1) Aluminum conduit.
2) Armored cable type AC (BX) cable.

3. Raceway And Conduit Fittings:
a. Rigid Steel Conduit And IMC: Threaded and designed for conduit use.
b. EMT:
1) Compression type.
2) Steel set screw housing type.
c. PVC Conduit:
1) PVC type. Use PVC adapters at all boxes.

2) PVC components, (conduit, fittings, cement) shall be from same Manufacturer.

d. Flexible Steel Conduit: Screw-in type.

e. Liquid-tight Flexible Metal Conduit: Sealtite type.

f. Expansion fittings shall be equal to OZ Type AX sized to raceway and including bonding jumper.

g. Prohibited Fitting Materials:
   1) Crimp-on, tap-on, indenter type fittings.
   2) Cast set-screw fittings for EMT.
   3) Spray (aerosol) PVC cement.

4. Outlet Boxes:
   a. Galvanized steel of proper size and shape are acceptable for all systems. Where metal boxes are used, provide following:
      1) Provide metal supports and other accessories for installation of each box.
      2) Equip ceiling and bracket fixture boxes with fixture studs where required.
      3) Equip outlets in plastered, paneled, and furred finishes with plaster rings and extensions to bring box flush with finish surface.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification Of Conditions:
   1. Confirm dimensions, ratings, and specifications of materials to be installed and coordinate these with site dimensions and with other Sections.

3.2 INSTALLATION

A. Interface With Other Work:
   1. Coordinate with Divisions 22 and 23 for installation of raceway for control of plumbing and HVAC equipment.
   2. Coordinate with Division 27 for installation of raceway for sound system.
   3. Before rough-in, verify locations of boxes with work of other trades to insure that they are properly located for purpose intended.
      a. Coordinate location of outlet for water coolers with Division 22.
      b. Coordinate location of outlets adjacent to or in millwork with Division 06 before rough-in. Refer conflicts to Architect and locate outlets under his direction.
   4. Install pull wires in raceways installed under this Section where conductors or cables are to be installed under other Divisions.

B. Conduit And Raceway:
   1. Conceal raceways within ceilings, walls, and floors, except at Contractor's option, conduit may be exposed on walls or ceilings of mechanical equipment areas and above acoustical panel suspension ceiling systems. Install exposed raceway runs parallel to or at right angles to building structure lines.
   2. Seal all raceways penetrating fire rated walls, ceilings and barriers. See Section 07 8400.
   3. Keep raceway runs 6 inches (150 mm) minimum from hot water pipes.
   4. Make no more than four quarter bends, 360 degrees total, in any conduit run between outlet and outlet, fitting and fitting, or outlet and fitting.
      a. Make bends and offsets so conduit is not injured and internal diameter of conduit is not effectively reduced.
      b. Radius of curve shall be at least minimum indicated by NFPA 70.
   5. Cut conduit smooth and square with run and ream to remove rough edges. Cap raceway ends during construction. Clean or replace raceway in which water or foreign matter have accumulated.

6. Install insulated bushings on each end of raceway 1-1/4 inches (32 mm) in diameter and larger, and on all raceways where cables emerge. Install expansion fittings where raceways cross building expansion joints.
7. Run two spare conduits from each new panelboard to ceiling access area or other acceptable accessible area and cap for future use.
8. Bend PVC conduit by hot box bender and, for PVC 2 inches (50 mm) in diameter and larger, expanding plugs. Apply PVC adhesive only by brush.
9. Installation In Framing:
   a. Do not bore holes in joists or beams outside center 1/3 of member depth or within 24 inches (600 mm) of bearing points. Do not bore holes in vertical framing members outside center 1/3 of member width.
   b. Holes shall be one inch (25 mm) diameter maximum.
10. Underground Raceway And Conduit:
   a. Bury underground raceway installed outside building 24 inches (600 mm) deep minimum.
   b. Bury underground conduit in planting areas 24 inches (600 mm) deep minimum. It is permissible to install conduit 6 inch (150 mm) below concrete sidewalks, however, conduit must be buried 24 inches (600 mm) deep at point of exit from planting areas.
11. Conduit And Raceway Support:
   a. Securely support raceway with approved straps, clamps, or hangers, spaced as required.
   b. Do not support from mechanical ducts or duct supports without Architect's written approval. Securely mount raceway supports, boxes, and cabinets in an approved manner by:
      1) Expansion shields in concrete or solid masonry.
      2) Toggle bolts on hollow masonry units.
      3) Wood screws on wood.
      4) Metal screws on metal.
12. Prohibited Procedures:
   a. Use of wooden plugs inserted in concrete or masonry units for mounting raceway, supports, boxes, cabinets, or other equipment.
   b. Installation of raceway that has been crushed or deformed.
   c. Use of torches for bending PVC.
   d. Spray applied PVC cement.
   e. Boring holes in truss members.
   f. Notching of structural members.
   g. Supporting raceway from ceiling system support wires.
   h. Nail drive straps or tie wire for supporting raceway.

C. Boxes:
1. Boxes shall be accessible and installed with approved cover.
2. Do not locate device boxes that are on opposite sides of framed walls in the same stud space. In other wall construction, do not install boxes back to back.
3. Locate boxes so pipes, ducts, or other items do not obstruct outlets.
4. Install outlets flush with finished surface and level and plumb.
5. Support switch boxes larger than two-gang with side brackets and steel bar hangers in framed walls.
6. At time of substantial completion, install blank plates on uncovered outlet boxes that are for future use.
7. Location:
   a. Install boxes at door locations on latch side of door, unless explicitly shown otherwise on Contract Drawings. Verify door swings shown on electrical drawings with architectural drawings, and report discrepancies to Architect before rough-in. Distance of box from jamb shall be 6 inches (150 mm) from door jamb.
   b. Properly center boxes located in walls with respect to doors, panels, furring, trim and consistent with architectural details. Where two or more outlets occur, space them uniformly and in straight lines with each other, if possible.
   c. Center ceramic tile boxes in tile.

D. Support speaker enclosures and mounting rings from structure or ceiling suspension system.

END OF SECTION

SECTION 26 2726

WIRING DEVICES

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Furnish and install wiring devices complete with plates as described in Contract Documents.

B. Related Requirements:
   1. Section 26 0501: 'Common Electrical Requirements'.

PART 2 - PRODUCTS

2.1 COMPONENTS

A. Manufacturers:
   1. Manufacturer Contact List:
      a. Cooper Wiring Devices, Peachtree City, GA www.cooperwiringdevices.com.
      b. General Electric Industrial Systems, Charlotte, NC www.geindustrial.com.
      c. Hubbell Building Automation, Austin, TX www.hubbell-automation.com.
      d. Hubbell Inc, Milford, CT www.hubbell-wiring.com or Hubbell Canada Inc, Pickering, ON (800) 263-4622 or (905) 839-4332.
      e. Hunt Control Systems Inc, Fort Collins, CO www.huntdimming.com.
      f. Intermatic Inc, Spring Grove, IL www.intermatic.com.
      g. IR-TEC America, Inc., Brea, CA www.irtec.com/en-ira/.
      h. Leviton Manufacturing Co, Little Neck, NY www.leviton.com or Leviton Manufacturing of Canada Ltd, Pointe-Claire, QB (800) 461-2002 or (514) 954-1840.
      i. Legrand, West Hartford, CT www.legrand.us.com or Vaughan, ON www.legrand.ca.com.
      j. Lutron Electronics Co Inc, Coopersburg, PA www.lutron.com.
      k. Ortronics, New London, CT www.ortronics.com.
      l. Paragon Electric Co Inc, Carol Stream, IL www.icca.invensys.com/paragon or Paragon Electric, Mississauga, ON (800) 951-5526 or (905) 890-5956.
      m. Pass & Seymour, Syracuse, NY www.passandseymour.com or Pass & Seymour Canada Inc, Concord, ON (905) 738-9195.
      n. Philips Lighting Co, Somerset, NJ www.lighting.philips.com/nam or Philips Lighting Canada, Scarborough, ON (416) 292-3000.
      o. Red Dot div of Thomas & Betts, Memphis, TN www.tnbcom.
      p. Schneider Electric North America, Palatine, IL www.schneider-electric.com (847) 397-2600.
      q. Sensorswitch, Wallingford, CT www.sensorswitch.com.
      r. Siemon Company, Watertown, CT www.siemon.com.
      s. Square D Co, Palatine, IL www.squared.com.
      t. Suttle, Hector, MN www.suttleonline.com.
      u. Tork Inc, Mount Vernon, NY www.tork.com.
      v. Watt Stopper Inc, Santa Clara, CA www.wattstopper.com.
   2. Product Options:
      a. Faces shall be nylon where available
      b. Devices of single type shall be from same Manufacturer.
      c. Devices are listed as white. Use white devices on light colored walls, brown on dark colored walls, and black on black walls.

B. Switches:

1. Standard Style:
   a. Category Four Approved Products. See Section 01 6200 for definitions of Categories:
      1) 20 AMP, single pole:
         a) Cooper: 2221V.
         b) Hubbell: HBL1221-I.
         c) Pass & Seymour: 20AC1-I.
         d) Leviton: 1221-2I.
      2) Two Pole:
         a) Cooper: 2222V.
         b) Hubbell: HBL1222-I.
         c) Pass & Seymour: 20AC2-I.
         d) Leviton: 1222-2I.
      3) Three Way:
         a) Cooper: 2223V.
         b) Hubbell: HBL1223-I.
         c) Pass & Seymour: 20AC3-I.
         d) Leviton: 1223-2I.
      4) Four Way:
         a) Cooper: 2224V.
         b) Hubbell: HBL1224-I.
         c) Pass & Seymour: 20AC4-I.
         d) Leviton: 1224-2I.
      5) Pilot Switch:
         a) Hubbell: HBL1221-PL.
         b) Pass & Seymour: 20AC1-RPL.
         c) Leviton: 1221-PLR.
      6) Lighted Toggle Switch:
         a) Single Pole:
            (1) Cooper: 2221-LTV.
            (2) Hubbell: HBL1221-IL.
            (3) Pass & Seymour: 20AC1-ISL.
            (4) Leviton: 1221-LHI.
         b) Three Way:
            (1) Cooper: 2223-LTV.
            (2) Hubbell: HBL1223-IL.
            (3) Pass & Seymour: 20AC3-ISL.
            (4) Leviton: 1223-7LC.

C. Receptacles:
   1. Standard Style:
      a. 15 AMP, specification grade, back and side wired, self grounding, tamper resistant.
      b. Verified by UL to meet Fed Spec WC-596F.
      c. Category Four Approved Products. See Section 01 6200 for definitions of Categories:
         1) Cooper: TR5262.
         2) Hubbell: BR20.
         3) Leviton: TBR20.
         4) Pass & Seymour: TR20.
   2. Ground Fault Circuit Interrupter (GFCI):
      a. 15 AMP, specification grade.
      b. Category Four Approved Products. See Section 01 6200 for definitions of Categories:
         1) Cooper: GF15W.
         2) Hubbell: GF5252WA.
         3) Leviton: 8599-W.
         4) Pass & Seymour: 1594-W.

D. Plates:
   1. Standard Cover Plates:
      a. Office / Occupied Areas:

1) Nylon or high impact resistant thermoplastic.
2) Color shall match wiring device.

b. All Other: Steel.

c. Ganged switches shall have gang plates.

d. Category Four Approved Manufacturers. See Section 01 6200 for definitions of Categories:
1) Cooper.
2) Hubbell.
3) Leviton.
4) Pass & Seymour.

2. Weatherproof In-Use Receptacle Covers:
a. NEMA 3R rated.
b. Cast aluminum.
c. Compatible with GFCI receptacles.
d. Complete with weather resistant gaskets and stainless steel screws.
e. Category Four Approved Products. See Section 01 6200 for definitions of Categories:
1) Hubbell: WP26MH, horizontal; WP26M, vertical.
2) Intermatic: WP1010HMC, horizontal; WP1010MC, vertical.
3) Red Dot: CKMG, horizontal; CKMGV, vertical.

E. Occupancy Sensors:
1. Ceiling, ultrasonic type.
a. Complete with sensor and combined relay / control transformer.
b. Category Four Approved Products. See Section 01 6200 for definitions of Categories:
1) Cooper Controls:
a) Sensor: OAC-U-0501-R.
b) Relay / Transformer: SP20-MV.
2) IR-TEC America:
a) Sensor: OS-361DT.
b) Relay / Transformer: PPU-300.
3) Leviton:
a) Sensor: OSC05-RUW.
b) Relay / Transformer: OPP20-D2.
4) Sensorswitch:
a) Sensor: CMPDT9.
b) Relay / Transformer: MP-20-SP0DM.
5) Watt Stopper:
a) Sensor: W-500A.
b) Relay / Transformer: BZ-150.
c. Provide manual ON and OFF momentary override switches. Refer to Contract Drawings for number of switches.
2. Ceiling, passive infrared type.
a. Complete with sensor and relay / transformer.
b. Category Four Approved Products. See Section 01 6200 for definitions of Categories:
1) Cooper Controls:
a) Sensor: OAC-P-1500-R.
b) Relay / Transformer: SP20-MV.
2) IR-TEC America:
a) Sensor: OS-361.
b) Relay / Transformer: PPU-300.
3) Leviton:
a) Sensor: OSC15-RIW.
b) Relay / Transformer: OPP20-D2.
4) Sensorswitch:
a) Sensor: CM10.
b) Relay / Transformer: MP-20-SP0DM.
5) Watt Stopper:
a) Sensor: CI-205.
b) Relay / Transformer: BZ-150.
c)

c. Provide manual ON and OFF momentary override switches. Refer to Contract Drawings for number of switches.

3. Ceiling, dual technology type.
   a. Complete with sensor and relay / transformer.
   b. Category Four Approved Products. See Section 01 6200 for definitions of Categories:
      1) Cooper Controls:
         a) Sensor: OAC-DT-0501-R.
         b) Relay / Transformer: SP20-MV.
      2) IR-TEC America:
         a) Sensor: OS-361DT.
         b) Relay / Transformer: PPU-300.
      3) Leviton:
         a) Sensor: OSC05-RMW.
         b) Relay / Transformer: OPP20-D2.
      4) Sensorswitch:
         a) Sensor: CMPDT9.
         b) Relay / Transformer: MP-20-SP0DM.
      5) Watt Stopper:
         a) Sensor: DT-305.
         b) Relay / Transformer: BZ-150.
   c. Provide manual ON and OFF momentary override switches. Refer to Contract Drawings for number of switches.
4. Wall switch, passive infrared type.
   a. Features include sensitivity and time delay adjustments.
   b. Manual ON / auto OFF capability.
   c. Category Four Approved Products. See Section 01 6200 for definitions of Categories:
      1) Cooper Controls: OSW-P-1001-MV-W.
      2) IR-TEC America: LbS-700NW.
      3) Leviton: ODS10-IDW.
      4) Sensorswitch: WSD-V-WH.
      5) Watt Stopper: PW-100-W.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install devices flush with walls, straight, and solid to box.

END OF SECTION

SECTION 26 5100

INTERIOR LIGHTING

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Furnish and install lighting system as described in Contract Documents, complete with lamps.

B. Related Requirements:
   1. Section 26 0501: 'Common Electrical Requirements'.
   2. Section 09 5116: 'Acoustical Tile Ceilings'.

1.2 REFERENCES

A. Reference Standards:
   1. American National Standards Institute (ANSI):
      a. ANSI C78.377-2017, 'American National Standard for Electric Lamps: Specification for the Chromaticity of Solid State Lighting Products'.
   2. Federal Communications Commission (FCC):
      a. Code of Federal Regulations (CFR):
         1) FCC 47 CFR Part 18, 'Industrial, Scientific, and Medical Equipment'.
   3. Institute of Electrical and. Electronics Engineers (IEEE):
      a. IEEE C62.41.1-2002, 'Guide on the Surge Environment in Low-Voltage (1000 V and Less) AC Power Circuits'.

PART 2 - PRODUCTS

2.1 ASSEMBLIES

A. Manufacturers:
   1. Manufacturer Contact List:
      a. Advance Transformer Co, Rosemont, IL www.advancetransformer.com.
      b. Cooper Wiring Devices by Eaton, Peachtree City, GA www.cooperindustries.com.
      c. General Electric Lighting, Hendersonville, NC or General Electric Lighting Canada Inc, Mississauga, ON www.gelighting.com/na.
      d. Howard Lighting Products, Laurel, MS www.howard-ind.com.
      e. Osram Sylvania, Danvers, MA www.sylvania.com or Osram Sylvania Ltd, Mississauga, ON (905) 673-6171.
      f. Philips Lighting Co, Somerset, NJ www.lighting.philips.com/nam or Philips Lighting Canada, Scarborough, ON (416) 292-3000.
      g. Universal Lighting Technologies, Nashville, TN www.universalballast.com.
      h. Venture Lighting International, Solon, OH www.venturelighting.com.
      i. Watt Stopper Inc, Santa Clara, CA www.wattstopper.com.
      j. Westinghouse Lighting Corp, Philadelphia, PA www.westinghouselightbulbs.com.
   2. Product Options: When several lighting fixtures are specified by name for one use on Drawings, select any one of those specified. Do not mix fixtures from different manufacturers specified for one use.

B. Materials
   1. Lighting Fixtures:

a. Type One Acceptable Products:
   1) See Fixture Schedule on Drawings for acceptable manufacturers and models.
   2) Equals as approved by Architect before bidding. See Section 01 6200.

2. Lamps:
   a. Other Lamps:
      1) Category Four Approved Manufacturers. See Section 01 6200 for definitions of Categories:
         a) General Electric.
         b) North American Philips.
         c) Osram / Sylvania.
         d) Westinghouse.

C. Factory Assembly:
   1. Fixtures shall be fully assembled complete with necessary wiring, sockets, lamps, reflectors, ballasts, auxiliaries, plaster frames, recessing boxes, hangers, supports, lenses, diffusers, and other accessories essential for complete working installation.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Interface With Other Work:
   1. Coordinate with Sections under 09 5000 heading to obtain symmetrical arrangement of fixtures in acoustic tile ceiling as shown on Reflected Ceiling Plan in Contract.
   2. Coordinate with Sections under 09 9000 heading to ensure that light coves are properly painted before installation of light fixtures.
   3. In mechanical equipment rooms, coordinate locations of light fixtures with equipment locations to provide proper room illumination without obstruction. Suspend fixtures that must be mounted below pipes, ducts, etc, with chains or other Architect approved method.

B. Securely mount fixtures. Support fixtures weighing 50 lbs (23 kg) or more from building framing or structural members.

C. Fasten lay-in fixtures to ceiling suspension system on each side with bolts, screws, rivets, or clips. In addition, connect lay-in fixtures with two (2) No. 12 gauge diagonal wires with three (3) turns each end; two (2) per fixture minimum to building framing or structural members. Connect to opposing corners of fixture. Wires may be slightly slack. Make final conduit connections to lay-in fluorescent fixtures with specified flexible conduit or flexible fixture whips.

D. Where fixtures are shown installed end to end, provide suitable connectors or collars to connect adjoining units to appear as a continuous unit.

E. Where recessed fixtures are to be installed, provide openings, plaster rings, etc, of exact dimensions for such fixtures to be properly installed. Coordinate fixture installation with ceiling type and thickness. Terminate circuits for recessed fixtures in an extension outlet box near fixture and connect with specified flexible conduit.

F. Verify operation of track lighting system in Cultural Center, then remove and store track lighting fixtures as directed.

G. Do not locate incandescent fixtures in closet or storage areas within 18 inches (450 mm) and fluorescent fixtures within 6 inches (150 mm) of shelves.

3.2 ADJUSTMENT

A. Repair scratches or nicks on exposed surfaces of fixtures to match original undamaged conditions.

END OF SECTION

END OF DIVISION 26