

PROJECT MANUAL

MONUMENT PARK, PRINCETON (BLDG. 22)

1005 S. 2000 E.
SLC, UT

506-8525

THE CHURCH OF
JESUS CHRIST
OF LATTER-DAY SAINTS



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BIDDING REQUIREMENTS

FOR PROJECTS (U.S.)

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INVITATION TO BID (U.S.)

1. CONTRACTORS INVITED TO BID THE PROJECT:

Dynamic Construction
Gines Construction
Hall Construction
JC Munro
RAM Construction

2. PROJECT:

Monument Park, Princeton (Bldg. 22)

3. LOCATION:

1005 S. 2000 E.
SLC, UT

4. OWNER:

Corporation of the Presiding Bishop of
The Church of Jesus Christ of Latter-day Saints, a Utah corporation sole
c/o
SL Monument Park FM Group

5. CONSULTANT:

Trio Design Inc.
3895 W. 7800 S., Suite 201
West Jordan, UT 84088

6. DESCRIPTION OF PROJECT:

- A. Culinary Pipe Replacement
- B. Products or systems may be provided under a Value Managed Relationship (VMR) the Owner has negotiated with the supplier. VMR products and systems are indicated as such 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 120 calendar days and will be as noted in the Agreement.

9. **BID OPENING:** 1. Sealed bids will be received by 2:10 pm; 29 June 2017 at the FM Office: 1320 South Wasatch Drive, SLC. Bids will be publicly opened at 2:15 pm; 29 June 2017.

10. BIDDING DOCUMENTS:

- A. Bidding Documents may be examined at the following plan room locations:
 - 1) Mountainlands Area Plan Room
- B. Bidding Documents are available to invited Contractors with a deposit of \$0.00 per set. Deposit will be refunded if documents are returned complete and in good condition within five days of bid opening.

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.

END OF DOCUMENT

INSTRUCTIONS TO BIDDERS (U.S.)

1. DOCUMENTS:

- A. Bidding Documents include Bidding Requirements and proposed Contract Documents. Proposed Contract Documents consist of:
 - 1) Contractor Bid Proposal and Project Agreement (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 Contractor Bid Proposal and Project Agreement (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) 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 one week prior to bid opening or by fax no later than 48 hours prior to bid opening.

4. BIDDING PROCEDURES:

- A. Form and Style of Bids

- 1) Use Owner's Bid Form titled "Contractor Bid Proposal and Project Agreement (U.S.)".
- 2) Bid will be complete and executed by authorized representative of Bidder.
- 3) Do not delete from or add to the information requested on bid form.

B. Submission of Bids

- 1) Submit bid in sealed opaque envelope containing only bid form.
- 2) It is bidder's sole responsibility to see that its bid is received at or before the specified time. Bids received after specified bid opening time may be returned to bidders unopened.
- 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 by written request or by reclaiming bid envelope.
- 3) Prior to bid opening, bidder may mark and sign on the sealed envelope that bidder acknowledges any or all Addenda.

5. CONSIDERATION OF BIDS:

A. Opening Of Bids - See Invitation to Bid.

B. Acceptance Of Bid

- 1) No bidder will consider itself under contract after opening and reading of bids until Owner accepts Contractor's Bid Proposal by executing same.
- 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 "Contractor Bid Proposal and Project Agreement (U.S.)" provided by Owner.

7. MISCELLANEOUS:

A. Pre-Bid Conference. A pre-bid conference will be held: 2:30 pm; 22 June 2017 at the project site.

END OF DOCUMENT

INFORMATION AVAILABLE TO BIDDERS (U.S.)

1. GEOTECHNICAL DATA

- A. Geotechnical Report – n/a

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)
- 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:
CORPORATION OF THE PRESIDING BISHOP OF
THE CHURCH OF JESUS CHRIST OF LATTER-DAY SAINTS**

Building Name: Monument Park, Princeton (Bldg. 22)

Building Plan Type: _____

Building Address: 1005 S. 2000 E. SLC, UT

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

Project Number: 506-8525

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

CONTRACTOR BID PROPOSAL AND PROJECT AGREEMENT (U.S.)

Corporation of the Presiding Bishop of The Church of Jesus Christ of Latter-day Saints, a Utah corporation sole, ("Owner") and the undersigned Contractor ("Contractor") enter into this *Contractor Bid Proposal and Project Agreement (U.S.)* ("Agreement") and agree as follows:

1. **Property/Project.**

Property/Project Number: 506-8525
Property Address ("Project Site"): 1005 South 2000 East
Project Type: R&I
Project Name ("Project"): Monument Park, Princeton (Bldg. 22)
Stake Name: Monument Park Stake

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

3. **Contract Documents.** Contract Documents consist of:

- a. This Agreement;
- b. Supplementary Conditions for Bid Proposal and Project Agreement (U.S.);
- c. The Specifications (Division 01 and Divisions _____);
- d. Drawings entitled and dated _____;
- e. Addendum No. with date(s) _____; and
- f. 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 (\$_____). This is the Contractor's Bid Proposal Amount.

5. **Payment.**

- a. If the Contractor's Bid Proposal Amount 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.

6. **Extras and Change Orders.** Owner may order changes in the Work by altering, adding to, or deducting from the Work. In the event of such a change, Contractor's compensation and/or the time of completion will be adjusted to reflect the change. Contractor will not commence work on any change until either: (a) Contractor and Owner have agreed in writing to the amount of the adjustment resulting from the change; 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.

7. **Correction of Work.** 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 Substantial Completion 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 One hundred twenty (120) 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 other than those delays willfully caused by Owner.

9. **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. Contractor will conform to all ordinances and covenants governing the Project Site and/or Work.

10. **Compliance with Laws.** Contractor will comply with all applicable laws, ordinances, rules, regulations, and orders of any public authorities relating to performance of the Work.

11. **Payment of Subcontractors and Materialmen.** Contractor will promptly pay for all labor, materials, and equipment used to perform the Work.

12. **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.
 - 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 \$500,000 or Contractor's actual coverage, whichever is greater; 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.

13. **Independent Contractor Relationship.** The parties expressly agree that Contractor is not an agent or employee of Owner but is an independent contractor solely responsible for all expenses relating to Contractor's business.
14. **Comply with Intellectual Property Rights of Others.** Contractor represents and warrants that no Work (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).
15. **Confidentiality / Property Rights.**
 - a. 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 for or relative to Work performed under this Agreement, such products, services, and Work of Contractor constituting works made for hire. Contractor will not reuse any portions of such items provided by Owner or developed by Contractor 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.
 - b. In addition, Contractor shall ensure that Contractor, 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:
 - 1) The name or address of any affiliate, customer or contractor of Owner or any information concerning the transactions of any such person with Owner;
 - 2) Any information relating to contracts, agreements, business plans, budgets or other financial information of Owner to the extent such information has not been made available to the public by the Owner; and
 - 3) Any other information that is marked or noted as confidential by the Owner at the time of its disclosure.
16. **Ownership and Use of Renderings and Photographs.** Renderings representing the Work are the property of Owner. All photographs of the Work, whether taken during performance of the Work or at completion, are the property of the Owner. The Owner reserves all rights including copyrights to renderings and photographs of the Work. No renderings or photographs shall be used or distributed without written consent of the Owner.
17. **Public Statements Regarding Work or Property.** Contractor will not make any statements or provide any information to the media about the Work or Property without the prior written consent of Owner. If Contractor receives any requests for information from media, Contractor will refer such requests to Owner.
18. **No Commercial Use of Transaction or Relationship.**
 - a. 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 Work or Property, including, without limitation:
 - 1) By referring to this Agreement, Owner, or the Work or Property 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;
- 2) By using or allowing the use of any photographs of the Work 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 service or product; or
 - 3) 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 Work or Property.

- b. Notwithstanding the foregoing, Contractor may include a reference to Owner and the services and equipment provided under this Agreement 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, the services and equipment is included with at least several other similar references and is given no more prominence than such other references.

19. **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, 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 costs and expenses, arising out of or resulting from performance of 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 worker's compensation acts, disability benefit acts, or other employee benefit acts.

20. **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 attorneys fees incurred by that party in obtaining the dismissal, including without limitation copy costs, and expert and consultant fees and expenses.

21. **Termination of Agreement 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.
22. **Termination of Agreement by Owner for Cause.** Should Contractor 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, take possession of the premises and all materials, tools, and appliances thereon, and finish the Work by whatever method Owner deems expedient. In such case, 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 attorneys fees, expert fees, copy costs, and other expenses), such excess will be paid to Contractor, less any offsets and recoupment. 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.
23. **Termination of Agreement 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 and recoupment. 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.
24. **Assignment of Contract.** The parties hereto will not assign any rights or obligations under this Agreement without the prior written consent of the other party.
25. **Integration Clause.** The Contract Documents reflect the full agreement of the parties with respect to the Project and the Work and supersede all prior discussions, agreements, and representations regarding the subject matter of the Contract Documents. The Contract Documents may be amended only in a written document signed by both parties hereto.

26. **Applicable 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.
27. **Enforcement.** In the event either party commences legal action to enforce or rescind any term of the Contract Documents, the prevailing party will be entitled to recover its attorneys fees and costs, 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.
28. **Bid Proposal/Agreement.** Contractor's submission to Owner of this agreement signed by Contractor will constitute Contractor's offer and bid proposal to perform the Work described in this agreement according to the terms thereof. Owner's signing of this agreement and delivery to Contractor of a signed copy will constitute acceptance of Contractor's offer and will convert this document to a binding agreement.
29. **Effective Date.** The effective date of this Agreement is the date indicated by the Owner's signature.

OWNER:

Corporation of the Presiding Bishop of
The Church of Jesus Christ of Latter-day Saints,
a Utah corporation sole.

Signature:

Print Name: Jason Killian

Title: Facility Manager

Address:
1320 South Wasatch Drive
Salt Lake City, UT 84108

Telephone No: 801-584-3198

Facsimile No: N/A

Email: jkillian@ldschurch.org

Effective Date:

Reviewed By:

CONTRACTOR:

(company)

Signature:

Print Name:

Title:

Address:

Telephone No:

Facsimile No:

Email:

Fed. I.D. or SSN:

License No:

Date Signed:

DIVISION 01**SECTION 01 0000****GENERAL REQUIREMENTS: R&I PROJECT****01 1000 SUMMARY****01 1200 MULTIPLE CONTRACT SUMMARY****01 1400 WORK RESTRICTIONS****01 3000 ADMINISTRATIVE REQUIREMENTS****01 3100 PROJECT MANAGEMENT AND COORDINATION****01 3300 SUBMITTAL PROCEDURES****01 3500 SPECIAL PROCEDURES****01 4000 QUALITY REQUIREMENTS****01 4301 QUALITY ASSURANCE – QUALIFICATIONS****01 4523 TESTING AND INSPECTING SERVICES****01 5000 TEMPORARY FACILITIES AND CONTROLS****01 6100 PRODUCT REQUIREMENTS****01 6200 PRODUCT OPTIONS****01 6400 OWNER-FURNISHED PRODUCTS****01 6600 DELIVERY, STORAGE, AND HANDLING REQUIREMENTS****01 7000 EXECUTION REQUIREMENTS****01 7400 CLEANING AND WASTE MANAGEMENT****01 7700 CLOSEOUT PROCEDURES****01 7800 CLOSEOUT SUBMITTALS****SECTION 01 1000 SUMMARY**

- A. Provisions contained in Division 01 apply to all other sections and divisions of Specifications. All instructions contained in Specifications are directed to Contractor. Unless specifically provided otherwise, all obligations set forth in Specifications are obligations of Contractor.
- B. Comply with applicable laws and regulations.
- C. Owner may provide furnishings and/or equipment for Project. Contractor will receive, store, and protect such items on site until the date Owner accepts Project.
- D. Work by Owner: Owner will furnish and install some portions of the Work with its own forces. Complete the Work necessary to accommodate the Work to be performed by Owner before scheduled date for performance of such Work.

SECTION 01 1200 MULTIPLE CONTRACT SUMMARY

- A. Separate Contracts may be issued by Owner for performance of certain construction operations at Project site. Contractor will afford other contractors reasonable opportunity to place and store their materials and equipment on site and to perform their work and will properly connect and coordinate its work with theirs where applicable.

SECTION 01 1400 WORK RESTRICTIONS

- A. During construction period, Contractor will have use of premises for construction operations. Contractor will ensure that Contractor, its employees, subcontractors, and 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 and/or other uniformed security personnel who have been retained by Owner or Contractor to provide security services.

B. Existing Facilities:

1. If Owner will occupy existing building, reasonably accommodate use of existing facilities by Owner.

SECTION 01 3000 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate construction activities to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations that are dependent upon each other for proper installation, connection, and operation. Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials.

SECTION 01 3100 PROJECT MANAGEMENT AND COORDINATION

A. Multiple Contract Coordination:

1. Contractor shall be responsible for coordination of Temporary Facilities and Controls, Construction Waste Management and Disposal services, and Final Cleaning for entire Project unless directed otherwise by Owner's Representative for those who perform work on Project from Notice to Proceed to date of Substantial Completion.

B. Preconstruction Conference:

1. Attend preconstruction conference and organizational meeting scheduled by Architect or Owner Representative at Project site or other convenient location.
2. Be prepared to discuss items of significance that could affect progress, including such topics as:
 - a. Construction schedule, equipment deliveries, general inspection of tests, preparation of record documents and O&M manuals, project cleanup, security, shop drawings, samples, use of premises, work restrictions, and working hours.

SECTION 01 3300 SUBMITTAL PROCEDURES

- A. Coordination preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently before performance of related construction activities to avoid delay.
- B. Allow sufficient review time so installation will not be delayed by time required to process submittals.
- C. Place permanent label or title block on each submittal for identification. Include name of entity that prepared each submittal on label or title block.
- D. Package each submittal appropriately for transmittal and handling.

SECTION 01 3500 SPECIAL PROCEDURES

A. Hot Work Permit (Available from Owner's Representative):

1. Required for doing hot work involving open flames or producing heat or sparks such as:
 - a. Brazing.
 - b. Cutting.
 - c. Grinding.
 - d. Soldering.
 - e. Thawing pipe.
 - f. Torch applied roofing.

- g. Welding.

SECTION 01 4000 QUALITY REQUIREMENTS

- A. Testing and inspecting services are used to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with Contract Document requirements.
- B. Conflicting Requirements: If compliance with two or more standards is specified and standards establish different or conflicting requirements for minimum quantities or quality levels, comply with most stringent requirement.
- C. Minimum Quantity or Quality Levels: Quantity or quality level shown or specified shall be the minimum provided or performed. Actual installation may comply exactly with minimum quantity or quality specified, or it may exceed minimum within reasonable limits.
- D. Quality Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to verify compliance and guard against defects and deficiencies and substantiate that proposed construction will comply with requirements. Owner or Owner's designated representative(s) will perform quality assurance to verify compliance with Contract Documents.
- E. Quality Control Services: Quality Control will be sole responsibility of Contractor. Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements performed by Contractor. They do not include inspections, tests or related actions performed by Architect or Owner Representative, governing authorities or independent agencies hired by Owner or Architect. Quality assurance performed by Owner will be used to validate Quality Control performed by Contractor:
1. Where services are indicated as Contractor's responsibility, engage qualified Testing Agency to perform these quality control services:
 - a. Contractor will not employ same testing entity engaged by Owner, without Owner's written approval.
- F. Notify Owner immediately if asbestos-containing materials or other hazardous materials are encountered while performing the Work.
- G. Submit to Owner permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, and similar documents, correspondence, and records establishing compliance with standards and regulations bearing upon performance of the Work.
- H. Repair And Protection:
1. On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
 2. Protect construction exposed by or for Quality Assurance and Quality Control activities.
 3. Repair and protection are Contractor's responsibility, regardless of assignment of responsibility for Quality Assurance and Quality Control Services.

SECTION 01 4301 QUALITY ASSURANCE - QUALIFICATIONS

- A. Qualifications: Qualifications in this Section establish minimum qualification levels required; individual Specification Sections specify additional requirements:
1. Fabricator / Supplier / Installer Qualifications:
 - a. Firm experienced in producing products similar to those indicated for this Project and with record of successful in-service performance, as well as sufficient production capacity to produce required units:
 - 1) Where heading '*VMR (Value Managed Relationship) Suppliers / Installers*' is used to identify list of specified suppliers or installers, Owner has established relationships that extend beyond requirements of this Project. No other suppliers / installers will be acceptable. Follow specified procedures to preserve relationships between Owner and specified suppliers / installers and advantages that accrue to Owner from those relationships.

- 2) Where heading 'Acceptable or Approved Suppliers / Installers / Fabricators' is used to identify list of specified suppliers / installers / fabricators, use only one of listed suppliers / installers / fabricators. No others will be acceptable.
2. Factory-Authorized Service Representative Qualifications:
 - a. Authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
3. Installer Qualifications:
 - a. Firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with record of successful in-service performance.
4. Manufacturer Qualifications:
 - a. Firm experienced in manufacturing products or systems similar to those indicated for this Project and with record of successful in-service performance, as well as sufficient production capacity to produce required units.
5. Manufacturer's Field Services Qualifications:
 - a. Experienced authorized representative of manufacturer to inspect field-assembled components and equipment installation, including service connections.
6. Professional Engineer Qualifications:
 - a. Professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of kind indicated:
 - 1) Engineering services are defined as those performed for installations of system, assembly, or products that are similar to those indicated for this Project in material, design, and extent.
7. Specialists:
 - a. Certain sections of Specifications require that specific construction activities will be performed by entities who are recognized experts in those operations:
 - 1) Specialists will satisfy qualification requirements indicated and will be engaged for activities indicated.
 - 2) Requirement for special will not supersede building codes and regulations governing the Work.
8. Testing Agency Qualifications:
 - a. Independent Testing Agency with experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E329; and with additional qualifications specified in individual Sections; and where required by authorities having jurisdiction, that is acceptable to authorities.
 - b. Testing Laboratory:
 - 1) AASHTO Materials Reference Laboratory (AMRL) Accreditation Program.
 - 2) Cement and Concrete Reference Laboratory (CCRL).
 - 3) Nationally Recognized Testing Laboratory (NRTL): Nationally recognized testing laboratory according to 29 CFR 1910.7.
 - 4) National Voluntary Laboratory (NVLAP): Testing Agency accredited according to National Institute of Standards and Technology (NIST) Technology Administration, U. S. Department of Commerce Accreditation Program.

SECTION 01 4523 TESTING AND INSPECTION SERVICES

- A. Submittals:
 1. Certificates: Testing Agency will submit certified written report of each inspection, test, or similar service.
 2. Tests and Evaluation Reports:
 - a. Testing Agency or Agencies will prepare logs, test reports, and certificates applicable to specific tests and inspections and deliver copies to Owner's Representative and to each of following if involved on project: Architect, Consulting Engineers (Engineer of Record), General Contractor, Authorities Having Jurisdiction (if required).
 3. Testing Agency:
 - a. Qualifications of Testing Agency management, personnel, inspector and technicians designated to project.
 - b. Provide procedures for non-destructive testing, equipment calibration records, personnel training records, welding inspection, bolting inspection, shear connector stud inspection, and seismic connection inspections.
- B. Quality Assurance:

1. Owner or Owner's designated representative(s) will perform quality assurance. Owner's quality assurance procedures may include observations, inspections, testing, verification, monitoring and any other procedures deemed necessary by Owner to verify compliance with Contract Documents.
 2. Owner will employ independent Testing Agencies to perform certain specified testing, as Owner deems necessary.
 3. Certification:
 - a. Product producers and associations, which have instituted approved systems of quality control and which have been approved by document approval agencies, are not required to have further testing.
 - b. Concrete mixing plants, plants producing fabricated concrete and wood or plywood products certified by agency, lumber, plywood grade marked by approved associates, and materials or equipment bearing underwriters' laboratory labels require no further testing and inspection.
 4. Written Practice for Quality Assurance:
 - a. Testing Agency will maintain written practice for selection and administration of inspection personnel, describing training, experience, and examination requirements for qualification and certification of inspection personnel.
 - b. Written practice will describe testing agency procedures for determining acceptability of structure in accordance with applicable codes, standards, and specifications.
 - c. Written practice will describe Testing Agency inspection procedures, including general inspection, material controls, visual welding inspection, and bolting inspection.
- C. Quality Control:
1. Quality Control will be sole responsibility of Contractor. Contractor will be responsible for testing, coordination, start-up, operational checkout, and commissioning of all items of the Work included in Project. All costs for these services will be included in Contractor's cost of the Work.
 2. Notify results of all Testing and Inspection performed by Contractor's independent Testing Agencies to Architect and/or Owner's Representative within 24 hours of test or inspection having been performed:
 - a. Testing and Inspection Reports will be distributed as follows:
 - 1) 1 copy to Owner's Representative.
 - 2) 1 copy to Architect.
 - 3) 1 copy to Consulting Engineer(s) (Engineer of Record).
 - 4) 1 copy to Authorities Having Jurisdiction (if required).
 3. Contractor's Responsibility:
 - a. Owner's employment of an independent Testing Agency does not relieve Contractor of Contractor's obligation to perform the Work in strict accordance with requirements of Contract Documents.
 - b. Tests and inspections that are not explicitly assigned to Owner are responsibility of Contractor.
 - c. Cooperate with Testing Agency(s) performing required inspections, tests, and similar services and provide reasonable auxiliary services as requested. Notify Testing Agency before operations to allow assignment of personnel. Auxiliary services required include but are not limited to:
 - 1) Providing access to the Work and furnishing incidental labor, equipment, and facilities deemed necessary by Testing Agency to facilitate inspections and tests at no additional cost to Owner.
 - 2) Taking adequate quantities of representative samples of materials that require testing or helping Testing Agency in taking samples.
 - 3) Providing facilities for storage and curing of test samples, and delivery of samples to testing laboratories.
 - 4) Providing Testing Agency with preliminary design mix proposed for use for materials mixes that require control by Testing Agency.
 - d. For any requested inspection, Contractor will complete prior inspections to ensure that items are ready for inspection.
 - e. All Work is subject to testing and inspection and verification of correct operation.
 - f. Comply:
 - 1) Upon completion of Testing Agency's inspection, testing, sample-taking, and similar services, repair damaged construction and restore substrates and finishes to eliminate deficiencies, including deficiencies in visual qualities of exposed finishes.
 - 2) Comply with Contract Documents in making such repairs.
 - g. Data:
 - 1) Furnish records, drawings, certificates, and similar data as may be required by testing and inspection personnel to assure compliance with Contract Documents.
 - h. Defective Work (Non-Conforming Work): Non-conforming Work as covered in General Conditions applies, but is not limited to following requirements Protection:

- 1) Where results of inspections, tests, or similar services show that the Work does not comply with Contract Document requirements, correct deficiencies in the Work promptly to avoid work delays.
 - 2) Where testing personnel take cores or cut-outs to verify compliance, repair prior to acceptance.
 - 3) Contractor will be responsible for any and all costs incurred resulting from inspection that was scheduled prematurely or retesting due to failed tests.
 - 4) Remove and replace any Work found defective or not complying with contract document requirements at no additional cost to Owner.
 - 5) Should test return unacceptable results, Contractor will bear all costs of retesting and re-inspection as well as cost of all material consumed by testing, and replacement of unsatisfactory material and/or workmanship.
- i. Protection:
- 1) Protect construction exposed by or for quality assurance and quality control service activities, and protect repaired construction.
- j. Scheduling: Contractor is responsible for scheduling times for inspections, tests, taking samples, and similar activities:
- 1) Schedule testing and inspections in advance so as not to delay the Work and to eliminate any need to uncover the Work for testing or inspection.
 - 2) Notify Testing Agency and Architect or Owner as noted in Sections in Division 01 thru Division 50 prior to any time required for such services.
 - 3) Incorporate adequate time for performance of all inspections and correction of noted deficiencies.
 - 4) Schedule sequence of activities to accommodate required services with minimum of delay.
 - 5) Schedule sequence of activities to avoid necessity of removing and replacing construction to accommodate testing and inspections.
- k. Test and Inspection Log:
- 1) Provide system of tracking all field reports, describing items noted, and resolution of each item. Prepare record of tests and inspections. Include following requirements:
 - (a) Date test or inspection was conducted.
 - (b) Description of the Work tested or inspected.
 - (c) Date test or inspection results were transmitted to Architect or Owner Representative.
 - (d) Identification of Testing Agency or inspector conducting test or inspection.
 - 2) Maintain log at Project site. Post changes and modifications as they occur. Provide access to test and inspection log for Architect's or Owner's reference during normal working hours.
- D. Tests And Inspections - General:
1. Testing specifically identified to be conducted by Owner, will be performed by an independent entity and will be arranged and paid for by Owner.
 2. Individual Sections in Division 01 through Division 50 indicate if Owner will provide testing and inspection of the Work of that Section.
 3. Owner may engage additional consultants for testing, air balancing, commissioning, or other special services:
 - a. Activities of any such Owner consultants are in addition to Contractor testing of materials or systems necessary to prove that performance is in compliance with Contract requirements.
 - b. Contractor must cooperate with persons and firms engaged in these activities.
 4. Tests include but not limited to those described in detail in 'Field Quality Control' in Part 3 of Individual Sections in Divisions 01 through Division 50.
 5. Taking Specimens:
 - a. Only testing laboratory shall secure, handle, transport, or store any samples and specimens for testing.
 6. Scheduling Testing Agency:
 - a. Contractor will coordinate the Work and facilitate timeliness of such testing and inspecting services so as not to delay the Work.
 - b. Contractor will notify Testing Agency and Architect or Owner Representative to schedule tests and / or inspections.
- E. Testing Agency Services And Responsibility:
1. Testing Agency, including independent testing laboratories, will be licensed and authorized to operate in jurisdiction in which Project is located:
 - a. Approved Testing Agency Qualifications: Requirements of Section 01 4301 apply.
 2. Testing and Inspection Services:

- a. Testing Agency will not release, revoke, alter, or increase Contract Document requirements or approve or accept any portion of the Work.
 - b. Testing Agency will not give direction or instruction to Contractor.
 - c. Testing Agency will have full authority to see that the Work is performed in strict accordance with requirements of Contract Documents and directions of Owner's Representative and/or Architect.
 - d. Testing Agency will not provide additional testing and inspection services beyond scope of the Work without prior approval of Owner's Representative and/or Architect.
3. Testing Agency Duties:
- a. Independent Testing Agency engaged to perform inspections, sampling, and testing of materials and construction specified in individual specification Sections will cooperate with Architect or Owner Representative and Contractor in performance of its duties and will provide qualified personnel to perform required inspections and tests.
 - b. Testing Agency will test or obtain certificates of tests of materials and methods of construction, as described herein or elsewhere in technical specification.
 - c. Testing Agency will provide management, personnel, equipment, and services necessary to perform testing functions as outlined in this section.
 - d. Testing Agency must have experience and capability to conduct testing and inspecting indicated by ASTM standards and that specializes in types of tests and inspections to be performed.
 - e. Testing Agency will comply with requirements of ASTM E329, ASTM E543, ASTM C1021, ASTM C1077, ASTM C1093, ASTM D3666, ASTM D3740, and other relevant ASTM standards.
 - f. Testing Agency must calibrate all testing equipment at reasonable intervals (minimum yearly) with accuracy traceable to either National Bureau of Standards or accepted values of natural physical constants.
 - g. Welding Procedure Review: Testing Agency will provide review and approval or rejection of all welding procedures to be used and verify compliance with all reference standard requirements.
4. Testing and Inspection Reports:
- a. Conduct and interpret tests and inspections and state in each report whether tested and inspected Work complies with or deviates from requirements.
 - b. Laboratory Reports: Testing Agency will furnish reports of materials and construction as required, including:
 - 1) Description of method of test.
 - 2) Identification of sample and portion of the Work tested:
 - (a) Description of location in the Work of sample.
 - (b) Time and date when sample was obtained.
 - (c) Weather and climatic conditions at time when sample was obtained.
 - 3) Evaluation of results of tests including recommendations for action.
 - c. Inspection Reports:
 - 1) Testing Agency will furnish "Inspection at Site" reports for each site visit documenting activities, observations, and inspections.
 - 2) Include notation of weather and climatic conditions, time and date conditions and status of the Work, actions taken, and recommendations or evaluation of the Work.
 - d. Reporting Testing and Inspection (Conforming Work):
 - 1) Submit testing and inspection reports as required within twenty four (24) hours of test or inspection having been performed.
 - e. Reporting Testing and Inspection Defective Work (Non-Conforming Work):
 - 1) Testing Agency, upon determination of irregularities, deficiencies observed or test failure(s) observed in the Work during performance of its services of test or inspection having been performed, will:
 - (a) Verbally notify results to Architect, Contractor, and Owner's Representative within one hour of test or inspection having been performed (if Defective Work (Non-Conforming Work) is incorporated into project).
 - (b) Submit written inspection report and test results as required within twenty four (24) hours of test or inspection having been performed.
 - f. Final Report:
 - 1) Submit final report of tests and inspections at Substantial Completion, which identify unresolved deficiencies.
- F. Architect's Responsibility:
1. Architect Duties:
 - a. Notify Owner's Representative before each test and/or inspection:
- G. Field Quality Control:

1. Field Tests And Inspections:
 - a. Field Test and Inspection requirements are described in detail in 'Field Quality Control' in Part 3 Execution' of individual Sections in Division 01 thru Division 49.

SECTION 01 5000 TEMPORARY FACILITIES AND CONTROLS

- A. Owner will provide electric power for construction activities within limits available at existing facility.
- B. Proprietary Camera Services: In its absolute discretion, and with or without notice to Contractor, Owner may provide from time to time, but is not obligated to provide, one or more cameras on or about Project site and/or signage or notices of the same:
 1. If provided by Owner, such camera(s) and/or signage and notices are solely for Owner's benefit and convenience and shall not be for benefit of Contractor, Subcontractor(s) or for any third person.
 2. Owner shall have no liability, obligation, or responsibility to Contractor, Subcontractors, or any third person relative to such camera(s), signage, or notices, or absence of camera(s), signage, or notices, including without limitation, installation, maintenance, operation, repair, testing, functionality, capacity, recording, monitoring, posting, etc., of the same (hereafter 'Proprietary Camera Services').
 3. Contractor, with Owner's prior consent (which shall not be unreasonably withheld), may relocate such camera(s), signage, or notices as necessary to not unreasonably, materially and physically interfere with work at Project Site.
 4. Contractor's obligations under Contract Documents, including but not limited to, Contractor's obligation for security of Project Site, are not modified by Owner's opportunity to provide, actually providing, or not providing Proprietary Camera Services and/or signage or notices regarding the same.
 5. This Specification Section does not preclude Contractor from providing its own camera(s), signage, or notices pursuant to terms and conditions of this Agreement. Neither does this Section reduce, expand or modify any other right or obligation of Owner pursuant to terms of this Agreement.
- C. Exercise caution to avoid fire damage: Do not build fires on site.
- D. Permanent mechanical system may be operated upon following conditions:
 1. Do not interfere with normal set-back temperature patterns except as approved by Project Manager.
 2. Do not operate system when the Work causing airborne dust is occurring or when dust caused by such Work is present without first installing temporary filtering system.
- E. Existing lighting system may be used by Contractor.
- F. Contractor will use existing water supply for construction purposes to extent of existing facilities.
- G. Existing restroom facilities may be used by Contractor. Clean restrooms and portions of existing building used in accessing restrooms daily. If existing facilities are not usable, provide and maintain temporary sanitary toilet.
- H. Erect adequate barricades, warning signs, and lights necessary to protect persons from injury or harm.
- I. Contractor is responsible for security of materials, tools, and equipment. Do not permit others to use building keys provided by Owner. Safeguard building and contents while the Work is being performed and secure building when the Work is finished for day.
- J. Protect existing trees and plants. Remove and replace vegetation that dies or is damaged beyond repair due to construction activities.
- K. Provide temporary enclosures at exterior building openings for security and protection from weather, theft, and vandalism. Erect and maintain dust-proof partitions and enclosures as required to prevent spread of dust and fumes to occupied portions of building.
- L. Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations and reduce possibility that air, waterways, and subsoil might be contaminated or polluted, or that other undesirable effects might result:
 1. Avoid use of tools and equipment that produce harmful noise.

2. Restrict use of noisemaking tools and equipment to hours that will minimize complaints from persons or firms near site.
3. Protect the Work, materials, apparatus, and fixtures from injury due to weather, theft, and vandalism.

SECTION 01 6100 PRODUCT REQUIREMENTS

- A. Provide products that comply with Contract Documents, are undamaged, and, unless otherwise indicated, are new and unused at time of installation. Provide products complete with accessories, trim, finish, safety guards, and other devices and details needed for complete installation and for intended use and effect.

SECTION 01 6200 PRODUCT OPTIONS

- A. Product selection is governed by Contract Documents and governing regulations, not by previous Project experience. Procedures governing product selection include:
1. Substitutions And Equal Products:
 - a. Generally speaking, substitutions for specified products and systems, as defined in Uniform Commercial Code, are not acceptable. However, equal products may be approved upon compliance with Contract Document requirements.
 - b. Approved Products / Manufacturers / Suppliers / Installers:
 - 1) Category One:
 - (a) Owner has established 'Value Managed Relationships' that extend beyond requirements of this Project. No substitutions or equal products will be allowed on this Project.
 - (b) Follow specified procedures to preserve relationships between Owner and specified manufacturers / suppliers and advantages that accrue to Owner from those relationships.
 - 2) Category Two:
 - (a) Owner has established National Contracts that contain provisions extending beyond requirements of this Project. No substitutions or equal products will be allowed on this Project.
 - (b) Follow specified procedures to preserve relationships between Owner and specified manufacturers / suppliers and advantages that accrue to Owner from those relationships.
 - 3) Category Three:
 - (a) Specified products are provided to Church Projects under a National Account Program. Use these products to preserve advantages that accrue to Owner from those programs. No substitutions or equal products will be allowed on this Project.
 - 4) Category Four:
 - (a) Provide only specified products available from manufacturers listed. No substitutions, private-labeled, or equal products, or mixing of manufacturers' products is allowed on this Project.
 - (b) In Sections where lists recapitulating Manufacturers previously mentioned in Section are included under heading '*Manufacturers*' or '*Approved Manufacturers*', this is intended as convenience to Contractor as listing of contact information only. It is not intended that all manufacturers in list may provide products where specific products and manufacturers are listed elsewhere in Section.
 - c. Acceptable Products / Manufacturers / Suppliers / Installers:
 - 1) Type One: Use specified products / manufacturers unless approval to use other products / manufacturers has been obtained from Architect or Owner Representative by Addendum.
 - 2) Type Two: Use specified products / manufacturers unless approval to use other products and manufacturers has been obtained from Architect or Owner Representative in writing before installing or applying unlisted or private-labeled products.
 - 3) Use 'Equal Product Approval Request Form' to request approval of equal products, manufacturers, or suppliers before bidding or before installation, as noted in individual Sections.
 - d. Quality / Performance Standard Products / Manufacturers:
 - 1) Class One: Use specified product / manufacturer or equal product from specified manufacturers only.
 - 2) Class Two: Use specified product / manufacturer or equal product from any manufacturer.
 - 3) Products / manufacturers used will conform to Contract Document requirements.

SECTION 01 6400 OWNER-FURNISHED PRODUCTS

- A. Install items furnished by Owner or receive and store in safe condition items purchased directly by Owner according to requirements of Contract Documents.

SECTION 01 6600 DELIVERY, STORAGE, AND HANDLING REQUIREMENTS

- A. Deliver, store, and handle products according to manufacturer's recommendations, using means and methods that will prevent damage, deterioration, and loss, including theft.
- B. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
- C. Deliver products to site in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
- D. Inspect products upon delivery to ensure compliance with Contract Documents, and to ensure that products are undamaged and properly protected.
- E. Store products at site in manner that will simplify inspection and measurement of quantity or counting of units.
- F. Store heavy materials away from Project structure so supporting construction will not be endangered.
- G. Store products subject to damage by elements above ground, under cover in weather tight enclosure, with ventilation adequate to prevent condensation. Maintain temperature and humidity within range required by manufacturer's instructions.

SECTION 01 7000 EXECUTION REQUIREMENTS

- A. Design, furnish, and install all shoring, bracing, and sheathing as required for safety and for proper execution of the Work and, unless otherwise required, remove same when the Work is completed.
- B. Require installer of each major component to inspect both substrate and conditions under which the Work is to be done:
1. Notify Owner in writing of unsatisfactory conditions.
 2. Do not proceed until unsatisfactory conditions have been corrected.
- C. Provide attachment and connection devices and methods necessary for securing the Work:
1. Secure the Work true to line and level.
 2. Allow for expansion and building movement.
- D. Recheck measurements and dimensions before starting each installation.
- E. Where mounting heights are not shown, install individual components at standard mounting heights recognized within industry or local codes for that application. Refer questionable mounting height decisions to Owner for final decision.
- F. Cover and protect furniture, equipment, and fixtures from soiling and damage when demolition the Work is performed in rooms and areas from which such items have not been removed.
- G. Completion Inspection:
1. Upon 100 percent completion of Project, Contractor will request Substantial Completion Inspection.
 2. Owner will conduct Substantial Completion Inspection in presence of Contractor and furnish list of items to be corrected.
 3. Contractor will notify Owner in writing when items have been corrected.

SECTION 01 7400 CLEANING AND WASTE MANAGEMENT

- A. Disposal Of Waste:
1. Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in landfill or incinerator acceptable to authorities having jurisdiction:

- a. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
 - b. Remove and transport debris in manner that will prevent spillage on adjacent surfaces and areas.
 2. Burning: Do not burn waste materials.
 3. Disposal: Transport waste materials off Owner's property and legally dispose of them.
- B. Progress Cleaning:
1. Keep premises broom-clean during progress of the Work.
 2. During handling and installation, protect construction in progress and adjoining materials in place. Apply protective covering where required to ensure protection from soiling, damage, or deterioration until Substantial Completion.
 3. Clean and maintain completed construction as frequently as necessary throughout construction period.
 4. Remove waste materials and rubbish caused by employees, subcontractors, and contractors under separate contract with Owner and dispose of legally.
- C. Final Cleaning:
1. Clean each surface or unit to condition expected in normal, commercial-building cleaning and maintenance program. Comply with manufacturer's instructions. Remove all rubbish from under and about building and leave building clean and habitable.
 2. In addition to general cleaning noted above, perform cleaning for all trades at completion of the Work in areas where construction activities have occurred.
 3. If Contractor fails to clean up, Owner may do so and charge cost to Contractor.

SECTION 01 7700 CLOSEOUT PROCEDURES

- A. General:
1. Closeout process consists of three specific project closeout inspections. Contractor shall plan sufficient time in construction schedule to allow for required inspections before expiration of Contract Time.
 2. Contractor shall conduct his own inspections of The Work and shall not request closeout inspections until The Work of the contract is reasonably complete and correction of obvious defects or omissions are complete or imminent.
 3. Date of Substantial Completion shall not occur until completion of construction work, unless agreed to by Architect / Owner's Representative and included on Certificate of Substantial Completion.
- B. Preliminary Closeout Review:
1. When Architect, Owner and Contractor agree that project is ready for closeout, Pre-Substantial Inspection shall be scheduled. Preparation of floor substrate to receive carpeting and any work which could conceivably damage or stain carpet must be completed, as carpet installation will be scheduled immediately following this inspection.
 2. Prior to this inspection, completed test and evaluation reports for HVAC system and font, where one occurs, are to be provided to Project Manager, Architect, and applicable consultants.
 3. Architect, Owner and Contractor review completion of punch list items. When Owner and Architect confirm that Contractor has achieved Substantial Completion of The Work, Owner, Architect and Contractor will execute Certificate of Substantial Completion that contains:
 - a. Punch list of items requiring completion and correction will be created.
 - b. Time frame for completion of punch list items will be established, and date for Substantial Completion Inspection shall be set.
- C. Substantial Completion Inspection:
1. When Architect, Owner and Contractor agree that project is ready for Substantial Completion, an inspection is held. Punch list created at Pre-Substantial Inspection is to be substantially complete.
 2. Prior to this inspection, Contractor shall discontinue or change over and remove temporary facilities from the site, along with construction tools, mock-ups and similar elements.
 3. Architect, Owner and Contractor review completion of punch list items. When Owner and Architect confirm that Contractor has achieved Substantial Completion of The Work, Owner, Architect and Contractor will execute Certificate of Substantial Completion that contains:
 - a. Date of Substantial Completion.
 - b. Punch List Work not yet completed, including seasonal and long lead items.
 - c. Amount to be withheld for completion of Punch List Work.
 - d. Time period for completion of Punch List Work.
 - e. Amount of liquidated damages set forth in Supplementary Conditions to be assessed if Contractor fails to complete Punch List Work within time set forth in Certificate.

4. Contractor shall present Closeout Submittals to Architect and place tools, spare parts, extra stock, and similar items required by Contract Documents in locations as directed by Facilities Manager.
- D. Final Acceptance Meeting:
1. When punch list items except for any seasonal items or long lead items which will not prohibit occupancy are completed, Final Acceptance Meeting is held.
 2. Owner, Architect and Contractor execute Owner's Project Closeout - Final Acceptance form, and verify:
 - a. All seasonal and long lead items not prohibiting occupancy, if any, are identified, with committed to completion date and amount to be withheld until completion.
 - b. Owner's maintenance personnel have been instructed on all system operation and maintenance as required by the Contract Documents.
 - c. Final cleaning requirements have been completed.
 3. If applicable, once any seasonal and long lead items are completed, Closeout Inspection is held where Owner and Architect verify that The Work has been satisfactorily completed, and Owner, Architect and Contractor execute Closeout portion of the Project Closeout - Final Acceptance form.
 4. When Owner and Architect confirm that The Work is satisfactorily completed, Architect will authorize final payment.

SECTION 01 7800 CLOSEOUT SUBMITTALS

- A. Operations And Maintenance Data: Operations And Maintenance Manual that include:
1. Project Manual:
 - a. Copy of complete Project Manual including Addenda, Modifications as defined in General Conditions, and other interpretations issued during construction:
 - (1) Mark these documents to show variations in actual Work performed in comparison with text of specifications and Modifications. Show substitutions, selection of options, and similar information, particularly on elements that are concealed or cannot otherwise be readily discerned later by direct observation.
 - (2) Note related record drawing information and Product Data.
 2. Soils Report:
 - a. Copy of Soils Report.
 3. Operations and Data:
 - a. Operations and maintenance submittals required by Contract Documents.
 4. Warranty Documentation:
 - a. Copies of warranties required by Contract Documents.
 5. Record Documentation:
 - a. Certifications required by Contract Documents.
 - b. Documentation submittals required by Contract Documents.
 - c. Testing and Inspection Reports required by Contract Documents.
 6. Landscape Management Plan (LMP):
 - a. Irrigation Section:
 - (1) Documentation required by Sections under 32 8000 Heading: Irrigation.
 - b. Landscaping Section:
 - (1) Documentation required by Sections under 32 8000 Heading: Irrigation.
- B. Warranties:
1. When written guarantees beyond one (1) year after substantial completion are required by Contract Documents, secure such guarantees and warranties properly addressed and signed in favor of Owner. Include these documents in Operations & Maintenance Manual(s) specified above.
 2. Delivery of guarantees and warranties will not relieve Contractor from obligations assumed under other provisions of Contract Documents.
- C. Project Record Documents:
1. Do not use record documents for construction purposes:
 - a. Protect from deterioration and loss in secure, fire-resistive location.
 - b. Provide access to record documents for reference during normal Working hours.
 2. Maintain clean, undamaged set of Drawings. Mark set to show actual installation where installation varies from the Work as originally shown. Give particular attention to concealed elements that would be difficult to measure and record at later date.
 - a. Mark record sets with red erasable pencil. Use other colors to distinguish between variations in separate categories of the Work.

- b. Mark new information that is important to Owner, but was not shown on Contract Drawings.
- c. Note related Change Order numbers where applicable.

END OF SECTION

SUPPLEMENTARY CONDITIONS

FOR CONTRACTOR BID PROPOSAL AND PROJECT AGREEMENT (U.S.)

ITEM 1 - GENERAL

1. Conditions of the Contract 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 Bid Proposal and Project Agreement, 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 Two Hundred Fifty dollars (\$250.00) 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

Utah

UTAH STATE SALES TAX:

Add the following to the Bid Proposal and Project Agreement:

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 Bid Proposal and Project Agreement:

- 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 Bid Proposal and Project Agreement:

- 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 Bid Proposal and Project Agreement with the following:

5. Payment

- a. If the Contractor's Bid Proposal Amount is over \$100,000.00, 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.

END OF DOCUMENT

SECTION 02 4119**SELECTIVE STRUCTURE DEMOLITION****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
1. Demolition and removal of selected portions of building as indicated in the Contract Documents.
 2. Salvage of existing items to be reused or recycled where indicated.

1.2 REFERENCES

- A. Reference Standards:
1. National Fire Protection Association / American National Standards Institute:
 - a. NFPA 241, 'Standard for Safeguarding Construction, Alteration, and Demolition Operations', 2013 Edition.
 2. American Society of Safety Engineers:
 - a. ASSE A10.6-2006, 'Safety Requirements for Demolition Operations'.

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
1. Storage or sale of removed items or materials will not be permitted on-site.
- B. Pre-Installation Conference:
1. Before beginning Selective Demolition work, meet on site to confirm work to be demolished, items to be salvaged or reused, and coordination with Owner.

1.4 QUALITY ASSURANCE

- A. Regulatory Agency Sustainability Approvals:
1. Comply with governing EPA notification regulations before beginning selective demolition.
 2. Comply with hauling and disposal regulations of authorities having jurisdiction.
 3. Standards: Comply with ANSI A10.6 and NFPA 241.

1.5 FIELD CONDITIONS

- A. Existing Conditions:
1. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

PART 2 - PRODUCTS: Not Used**PART 3 - EXECUTION****3.1 EXAMINATION**

- A. Verification Of Conditions:

1. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
 - a. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- B. Evaluation And Assessment:
 1. Hazardous Materials:
 - a. It is not expected that hazardous materials will be encountered in the Work. Identified hazardous materials will be removed by Owner before start of the Work.
 - b. If materials suspected of containing hazardous materials are encountered, do not disturb and immediately notify Architect.
 2. Inventory and record condition of items to be removed and reinstalled and items to be removed and salvaged.
 3. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure nature and extent of conflict. Promptly submit written report to Architect.

3.2 PREPARATION

- A. Utility Services:
 1. Existing Services/Systems: Maintain services/systems indicated to remain and protect them against damage during selective demolition operations.
 2. Service/System Requirements: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.
 - a. Arrange to shut off indicated utilities with utility companies.

3.3 SELECTIVE DEMOLITION

- A. General:
 1. Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
 2. Demolish and remove existing construction only to extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
 - a. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
 - b. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
 - c. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain fire watch and portable fire-suppression devices during flame-cutting operations.
 - d. Maintain adequate ventilation when using cutting torches.
 - e. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
 - f. Dispose of demolished items and materials promptly.
- B. Selective Demolition Procedures For Specific Materials:
 1. Masonry: Cut masonry at junctures with construction to remain, using power-driven saw, then remove masonry between saw cuts.
- C. Removed and Reinstalled Items:
 1. Clean and repair items to functional condition adequate for intended reuse. Paint equipment to match new equipment.
 2. Protect items from damage during storage.

3. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.
- D. Existing Items to Remain:
1. Protect construction indicated to remain against damage and soiling during selective demolition.
 2. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

3.4 CLEANING

- A. General:
1. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations.
 2. Return adjacent areas to condition existing before selective demolition operations began.
- B. Waste Management:
1. Disposal of Demolished Materials:
 - a. Remove demolished materials from Project site and legally dispose of them in an EPA-approved landfill. Do not burn demolished materials.
 - 1) Do not allow demolished materials to accumulate on-site.
 - 2) Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
 - 3) Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.

END OF SECTION

SECTION 06 2001**COMMON FINISH CARPENTRY REQUIREMENTS****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
 - 1. Furnish and install sealants required for items installed under this Section, as described in Contract Documents.
 - 2. Furnish and install following items as described in Contract Documents:
 - a. Site-built under-cabinet shelves and/or backs.
- B. Products Installed But Not Furnished Under This Section:
 - 1. Fixed Shelving not part of casework.
 - 2. Plastic Laminate Countertops.
 - 3. Wood Trim at ceilings.
 - 4. Miscellaneous as specified elsewhere.

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. Economy Grade: The lowest acceptable grade in both material and workmanship requirements, and is for work where price outweighs quality considerations.
 - b. 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.
 - c. Premium Grade: The highest Grade available in both material and workmanship where the highest level of quality, materials, workmanship, and installation is required.

PART 2 - PRODUCTS**2.1 MATERIALS****PART 3 - EXECUTION****3.1 EXAMINATION**

- A. Verification Of Conditions:
 - 1. Verify walls, ceilings, floors, and openings are plumb, straight, in-line, and square before installing Architectural Woodwork.
 - 2. Report conditions that are not in compliance to Architect before starting installation.

3.2 INSTALLATION

A. Special Techniques:

1. AWS Custom Grade is minimum acceptable standard, except where explicitly specified otherwise, for installation of architectural woodwork.

B. General Architectural Woodwork Installation:

1. Fabricate work in accordance with measurements taken on Project site.
2. Scribe, miter, and join accurately and neatly to conform to details.
3. Exposed surfaces shall be machine sanded, ready for finishing.
4. Countersink nails. Countersink screws and plug those exposed to view.

END OF SECTION

SECTION 06 2710**SHELVING****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
 - 1. Furnish and install shelving 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.**
 - 4) Facings:
 - a) All facings shall be Melamine or Kortron.
 - 5) Thickness:
 - a) **30 Inch** Span And Less: **3/4 inch** thick.
 - b) Spans Over **30 Inches** To **42 Inches** - **One inch** thick.
 - b. Edgings:
 - 1) Use **3/4 inch** Kortron or Melamine faced Panel Product with hot glued 3 mm thick PVC with eased edges. Apply banding on all four edges of shelving. with one inch return onto unexposed edges. Edge banding color to match Panel Product.

PART 3 - EXECUTION**3.1 INSTALLATION**

- A. 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** 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 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. Removing existing sealants specified in Sections where work required.
 - 2. 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

- A. Definitions:
 - 1. Sealant Types and Classifications:
 - a. ASTM Specifications:
 - 1) Type:
 - a) Type S: Single-component sealant.
 - b) Type M: Multi-component sealant.
 - 2) Grade:
 - a) Grade P: Pourable or self-leveling sealant used for horizontal traffic joints.
 - b) Grade NS: Non-sag or gunnable sealant used for vertical and non-traffic joints.
 - 3) Classes: Represent movement capability in percent of joint width.
 - a) Class 100/50: Sealant that, when tested for adhesion or cohesion under cyclic movement shall withstand of at least 100 percent increase and decrease of at least 50 percent of joint width as measured at time of application.
 - b) Class 50: Sealant that, when tested for adhesion or cohesion under cyclic movement shall withstand increase and decrease of at least 50 percent of joint width as measured at time of application.
 - c) Class 25: Sealant that, when tested for adhesion or cohesion under cyclic movement shall withstand increase and decrease of at least 25 percent of joint width as measured at time of application.
 - d) Class 12: Sealant that, when tested for adhesion and cohesion under cyclic movement shall withstand increase and decrease of at least 12 percent of joint width as measured at time of application.
 - 4) Use:
 - a) T (Traffic): Sealant designed for use in joints in pedestrian and vehicular traffic areas such as walkways, plazas, decks and parking garages.
 - b) NT (Non-Traffic): Sealant designed for use in joints in non-traffic areas.
 - c) I (Immersion): Sealant that meets bond requirements when tested by immersion (Immersion rated sealant applications require primer).

- d) M (Mortar): Sealant that meets bond requirements when tested on mortar specimens.
 - e) G (Glass): Sealant that meets bond requirements when tested on glass specimens.
 - f) A (Aluminum): Sealant that meets bond requirements when tested on aluminum specimens.
 - g) O (Other): Sealant that meets bond requirements when tested on substrates other than standard substrates, being glass, aluminum, mortar.
- b. Federal Specifications:
- 1) Type:
 - a) Type I: Self-leveling, pour grade.
 - (1) Compound which has sufficient flow to give smooth level surface when applied in horizontal joint at **40 deg F**.
 - b) Type II: Non-sag, gun grade
 - (1) Compound which permits application in joints on vertical surfaces without sagging (slumping) at temperatures **40 deg F** and **122 deg. F**
 - c) Type NS: Non-sag, gun grade.
 - (1) Non-sag shall be a compound which permits application in joints on vertical surfaces without sagging (slumping) at temperatures between **-20 deg F** and **122 deg. F**.
 - 2) Class:
 - a) Class A: Compounds resistant to 50 percent total joint movement (includes Type I and Type II).
 - (1) Capable of resisting compression-extension cycling of plus and minus 25 percent of nominal half inch width.
 - b) Class B: Compounds resistant to 25 percent total joint movement (includes Type I and Type II).
 - (1) Capable of resisting compression-extension cycling of plus and minus 12 1/2 percent of nominal half inch width.
2. Silicone: Any member of family of polymeric products whose molecular backbone is made up of alternating silicon and oxygen atoms and which has pendant hydrocarbon groups attached to silicon atoms. Used primarily as a sealant. Offers excellent resistance to water and large variations in temperature (**minus 100 deg F to + 600 deg F**)

B. Reference Standards:

- 1. American Association of State and Highway Transportation Officials:
 - a. AASHTO T 132-87(2013), 'Standard Method of Test for Tensile Strength of Hydraulic Cement Mortars'.
- 2. ASTM International:
 - a. ASTM C639-15, 'Standard Test Method for Rheological (Flow) Properties of Elastomeric Sealants'.
 - b. ASTM C661-15, 'Standard Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer'.
 - c. ASTM C679-15, 'Standard Test Method for Tack-Free Time of Elastomeric Sealants'.
 - d. ASTM C719-14, 'Standard Test Method for Adhesion and Cohesion of Elastomeric Joint Sealants Under Cyclic Movement (Hockman Cycle)'.
 - e. ASTM C793-05(2010), 'Standard Test Method for Effects of Laboratory Accelerated Weathering on Elastomeric Joint Sealants'.
 - f. ASTM C794-15a, 'Standard Test Method for Adhesion-in-Peel of Elastomeric Joint Sealants'.
 - g. ASTM C920-14a, 'Standard Specification for Elastomeric Joint Sealants'.
 - h. ASTM C1135-15, 'Standard Test Method for Determining Tensile Adhesion Properties of Structural Sealants'.
 - i. ASTM C1184-14, 'Standard Specification for Structural Silicone Sealants'.
 - j. ASTM C1193-16, 'Standard Guide for Use of Joint Sealants'.
 - k. ASTM C1248-08(2012), 'Standard Test Method for Staining of Porous Substrate by Joint Sealants'.
 - l. ASTM C1330-02(2013), 'Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid Applied Sealants'.

- m. ASTM C1481-12 'Standard Guide for Use of Joint Sealants with Exterior Insulation & Finish Systems (EIFS)'.
 - n. ASTM D412-15a, 'Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension'.
 - o. ASTM D2202-00(2014), 'Standard Test Method for Slump of Sealants'.
 - p. ASTM D2240-15, 'Standard Test Method for Rubber Property-Durometer Hardness'.
 - q. ASTM D5893-10, 'Standard Specification for Cold Applied, Single Component, Chemically Curing Silicone Joint Sealant for Portland Cement Concrete Pavements'.
 - r. ASTM E119-16a, 'Standard Test Methods for Fire Tests of Building Construction and Materials'.
- 3. Federal Specifications:
 - a. Federal Specification TT-S-001543A (CON-NBS), 'Sealing Compound: Silicone Rubber Base (for Calking, Sealing & Glazing in Buildings and Other Structures)' (9 Jun 1971).
 - b. TT-S-00230C (CON-NBS), 'Sealing compound: Elastomeric Type, Single Component (For Calking, Sealing, And Glazing In Buildings And Other Structures.' (2 Feb 1970).
 - 4. Government Services Administration (GSA), Commercial Item Descriptions (CID):
 - a. GSA CID A-A-272A, 'Sealing Compound: Silicone Rubber Base (For Caulking, Sealing, and Glazing in Buildings and Other Structures)'.
 - b. GSA CID A-A-1556, 'Sealing Compound Elastomeric Type, Single Component (For Caulking, Sealing, and Glazing in Buildings and Other Structures)'.

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Scheduling:
 - 1. Schedule work so waterproofing, water repellents and preservative finishes are installed after sealants, unless sealant manufacturer approves otherwise in writing.
 - 2. Ensure sealants are cured before covering with other materials.

1.4 SUBMITTALS

- A. Action Submittals:
 - 1. Product Data:
 - a. Manufacturer's specifications and other data needed to prove compliance with the specified requirements.
 - b. Manufacturer's literature for each Product.
- B. Informational Submittals:
 - 1. Certificates:
 - a. Manufacturer's Certificate:
 - 1) Certify products are suitable for intended use and products meet or exceed specified requirements.
 - 2) Certificate from Manufacturer indicating date of manufacture.
 - 2. Manufacturers' Instructions:
 - a. Manufacturer's installation recommendations for each Product.
 - b. Manufacturer's installation for completing sealant intersections when different materials are joined.
 - c. Manufacturer's installation for removing existing sealants and preparing joints for new sealant.

1.5 QUALITY ASSURANCE

- A. Qualifications:
 - 1. Manufacturer: Company specializing in manufacturing products specified in this section with minimum ten (10) years documented experience.
 - 2. Applicator Qualifications:
 - a. Company specializing in performing work of this section.

- b. Provide if requested, reference of projects with minimum three (3) years documented experience, minimum three (3) successfully completed projects of similar scope and complexity, and approved by manufacturer.
- c. Designate one (1) individual as project foreman who shall be on site at all times during installation.

1.6 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** or subjected to sustained temperatures exceeding **90 deg F** or as per Manufacturer's written recommendations
 4. Do not use sealants that have exceeded shelf life of product.

1.7 FIELD CONDITIONS

- A. Ambient Conditions:
 1. Allow wet surfaces to dry.
 2. Follow Manufacturer's temperature recommendations for installing sealants.

PART 2 - PRODUCTS

2.1 SYSTEMS

- A. Manufacturers:
 1. Manufacturer Contact List:
 - a. Dow Corning Corp., Midland, MI www.dowcorning.com.
 - b. Franklin International, Inc. Columbus, OH www.titebond.com.
 - c. GE Sealants & Adhesives (see Momentive Performance Materials Inc.).
 - d. Laticrete International Inc., Bethany, CT www.laticrete.com.
 - e. Momentive Performance Materials Inc. (formally GE Sealants & Adhesives), Huntersville, NC www.ge.com/silicones.
 - f. Sherwin-Williams, Cleveland, OH www.sherwin-williams.com.
 - g. Sika Corporation, Lyndhurst, NJ www.sikaconstruction.com or Sika Canada Inc, Pointe Claire, QC www.sika.ca.
 - h. Tremco, Beachwood, OH www.tremcosealants.com or Tremco Ltd, Toronto, ON (800) 363-3213.
- B. Materials:
 1. Design Criteria:
 - a. Compliance: Meet or exceed requirements of these standards:
 - 1) ASTM C920: Elastomeric joint sealant performance standard.
 - 2) ASTM C639 or ASTM D2202: Flow (sag or slump).
 - 3) ASTM C661 or ASTM D2240: Durometer hardness (shore A).
 - 4) ASTM C679 or ASTM C794: Tack free time (peel strength).
 - 5) ASTM C719: Joint movement capability.
 - 6) ASTM C793: Effects of accelerated weathering.
 - 7) ASTM C1135 or ASTM D412: Tensile adhesion strength.
 - 8) ASTM C1184: Structural silicone sealants.

- 9) ASTM C1248: Staining.
 - 10) ASTM D412: Modulus.
 - 11) ASTM D5893: Silicone Joint Sealant for Concrete Pavements.
 - 12) Federal Specification TT-S-001543A.
 - 13) Federal Specification TT-S-00230C.
 - 14) GSA CID A-A-272A.
 - 15) GSA CID A-A-1556.
 - b. Comply with Manufacturer's ambient condition requirements.
 - c. Sealants must meet Manufacturer's shelf-life requirements.
 - d. Sealants must adhere to and be compatible with specified substrates.
 - e. Sealants shall be stable when exposed to UV, joint movements, and particular environment prevailing at project location.
 - f. Primers Aluminum and other nonporous surfaces except glass require use of a primer. Installer Option to use Adhesion Test to determine if primer is required or use primer called out in related sections):
 - 1) Adhesion Test:
 - a) Apply silicone sealant to small area and perform adhesion test to determine if primer is required to achieve adequate adhesion. If necessary, apply primer at rate and in accordance with Manufacturer's instructions. See 'Field Quality Control' in Part 3 of this specification for Adhesive Test.
 - 2) If Primer required, shall not stain and shall be compatible with substrates.
 - 3) Allow primer to dry before applying sealant.
2. General Interior Sealants:
- a. General:
 - 1) Miscellaneous gaps between substrates.
 - b. Design Criteria:
 - 1) Meet ASTM C920, Type S, Grade NS, NT, and Class 25 test requirements.
 - 2) 100 percent silicone sealant.
 - c. Non-Paintable Sealant:
 - 1) Approved Product:
 - a) Dow Corning: Tub, Tile, And Ceramic Silicone Sealant.
 - b) Laticrete: Latasil Silicone Sealant.
 - c) Momentive Performance Materials (formerly, GE Sealants & Adhesives): GE SCS2800 SilGlaze II Silicone Sealant.
 - d) Sherwin Williams: White Lightning Silicone Ultra Low Odor Window and Door Sealant.
 - e) Tremco: Tremsil 200 Silicone Sealant.
 - f) Franklin International: Titebond 2601 (White) 2611 (Clear) 100% Silicone Sealant.
3. 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 and 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. Approved Products:
 - 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.

2.2 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 3 - EXECUTION

3.1 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.

3.2 PREPARATION

- A. Surface Preparation:
 - 1. Remove existing joint sealant materials where impacted by new work.
 - a. Clean joint surfaces of residual sealant and other contaminants capable of affecting sealant bond to joint surface using manufacturer's recommended joint preparation methods.
 - b. Repair deteriorated or damaged substrates as recommended by Sealant Manufacturer to provide suitable substrate. Allow patching materials to cure.
 - 2. Surfaces shall be clean, dry, free of dust, oil, grease, dew, frost or incompatible sealers, paints or coatings that may interfere with adhesion. Prepare substrates in accordance with Manufacturer's instructions:
 - a. Porous surfaces: Clean by mechanical methods to expose sound surface free of contamination.
 - b. Nonporous surfaces: Use two-cloth solvent wipe in accordance with ASTM C1193. Allow solvent to evaporate prior to sealant application.
 - c. Primers:
 - 1) Primers enhance adhesion ability.
 - 2) Use of primers is not a substitution for poor joint preparation.
 - 3) Primers should be used always in horizontal application where there is ponding water.
 - 3. Field test joints in inconspicuous location.

- a. Verify joint preparation and primer required to obtain optimum adhesion of sealants to joint substrate.
 - b. When test indicates sealant adhesion failure, modify joint preparation primer, or both and retest until joint passes sealant adhesion test.
4. Masking: Apply masking tape as required to protect adjacent surfaces and to ensure straight bead line and facilitate cleaning.

B. Joints:

1. Prepare joints in accordance with ASTM C1193.
 - a. Clean joint surfaces of contaminants 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.

3.3 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. Brass and copper surfaces.
 - b. 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** 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** minimum and **1/2 inch** 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** between painted or coated substrates.

3.4 TOLERANCES

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

3.5 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. 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.

3.6 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 09 0151**REHABILITATION OF ACOUSTICAL CEILING TILE****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
 - 1. Prepare and paint remaining existing ceiling tile in rooms where ceiling demolition and tile replacement will occur as described in Contract Documents.
- B. Related Requirements:
 - 1. Section 09 9001: Common Painting Requirements.

PART 2 - PRODUCTS**2.1 SYSTEM**

- A. Description:
 - 1. Use MPI(a) INT 9.3A Latex Finish system.
- B. Performance:
 - 1. Gloss / Sheen Level Required: Gloss Level 1.
- C. Materials:
 - 1. Acceptable Stain Blocker:
 - a. Benjamin Moore: 023 Fresh Start.
 - b. ICI Paints:
 - 1) ICI Dulux: 3210-XXXX Gripper Aquacrylic Primer / Sealer.
 - 2) ICI Devoe: 51801 Kilstain W / B Primer Sealer.
 - 3) ICI Fuller O'Brien: PrimZ Interior / Exterior Primer Sealer.
 - c. PPG Paints:
 - 1) PPG Pittsburgh Paints: 17-21 Seal-Grip Stain Blocker Primer.
 - 2) PPG Porter: 1129 Blankit Interior Acrylic Primer / Sealer.
 - d. Pratt & Lambert.
 - e. Sherwin-Williams.
 - f. Wm. Zinsser.
 - g. Equal as approved by Architect before use. See Section 01 6200.
 - 2. Approved Products:
 - 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. Finish Coat:
 - 1) MPI Product 53.

PART 3 - EXECUTION**3.1 APPLICATION**

- A. See appropriate paragraphs of Section 09 9001.
- B. Clean acoustic tile surface and prepare as recommended by Paint Manufacturer. In addition, apply shellac or a stain blocker as recommended by Finish Coat Manufacturer over dirty or stained areas.
- C. Apply finish coat as follows:
 - 1. Perforated tile: Roll or spray.
 - 2. Fissured tile: Spray only.

END OF SECTION

SECTION 09 2300**GYPSUM PLASTER****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
1. Furnish and install complete application of interior gypsum plaster as described in Contract Documents.

1.2 REFERENCES

- A. Reference Standards:
1. ASTM International:
 - a. ASTM C28/C28M-10, 'Standard Specification for Gypsum Plasters.'
 - b. ASTM C842-05(2010), 'Standard Specification for Application of Interior Gypsum Plaster.'

1.3 FIELD CONDITIONS

- A. Ambient Conditions:
1. Temperature in building shall be uniform and maintained at **55 deg F** minimum for week before application of plaster, during plastering operations, and until after plaster is dry. Use screens to protect from uneven heat if necessary.
 2. Provide ventilation to properly dry plaster during and subsequent to its application. This ventilation may be from outside air or mechanical ventilation. Avoid freezing or hot, dry winds.

PART 2 - PRODUCTS**2.1 SYSTEM**

- A. Performance:
1. Design And Performance Criteria:
 - a. Follow recommendations of ASTM C842 unless otherwise specified in this Section.
 - b. Required Coats:
 - 1) Hollow Masonry: Two coats (double-up method).
 - 2) Metal Lath, Gypsum Lath, or Concrete: Three coats.
- B. Materials:
1. Water: Clean, suitable for drinking.
 2. Plaster:
 - a. Gypsum Ready Mixed Plaster (Optional): Meet requirements of ASTM C28/C28M.
 - b. Gypsum Neat Plaster: Meet requirements of ASTM C28/C28M.
 - c. Gauging Plaster: Meet requirements of ASTM C28/C28M. Use fibered type for scratch coat over metal lath.
 3. Hydrated Lime: Meet requirements of ASTM C206 or ASTM C207, Type S, Manufacturer's designation to appear on bag.
 4. Keene's Cement: Meet requirements of ASTM C61/C61M.
 5. Lime Putty: Make from hydrated lime in accordance with Manufacturer's directions.

6. Sand:
 - a. Meet requirements of ASTM C35.
 - b. Sand for sand float finish coats shall pass No. 20 screen and be white, hard, sharp grains, free from soluble salts or injurious amounts of organic matter.
 7. Bonding Agent:
 - a. Type Two Acceptable Manufacturers:
 - 1) Plaster-Weld by Larsen Products Corp, Jessup, MD www.larsenproducts.com.
 - 2) Equal as approved by Architect before use. See Section 01 6200.
- C. Mixes:
1. Basecoat Proportions:
 - a. Two Coat Work: One part gypsum neat plaster, 2-1/2 parts dry sand.
 - b. Three Coat Work:
 - 1) Scratch Coat: One part gypsum, 2 parts dry sand.
 - 2) Brown Coat: One part Gypsum neat plaster, 3 parts dry sand.
 - c. Mixing:
 - 1) Job Mixed Gypsum Plasters:
 - a) Put in approximate amount of water.
 - b) If sand is used, add approximately 1/2 amount of aggregate. If vermiculite or perlite is used, add all aggregate.
 - c) Add cementitious materials.
 - d) Add remainder of sand aggregate.
 - e) Mix to required consistency, adding water if necessary.
 - f) Dump entire batch and use.
 - 2) Ready-Mixed Gypsum Plasters:
 - a) Put in approximate amount of water.
 - b) Add plaster.
 - c) Mix to required consistency, adding water if necessary.
 - d) Dump entire batch and use.
 - 3) Withhold approximately 10 percent of established quantity of mixing water from mortar until mixing is almost complete, then add as needed to produce necessary consistency. It is also recommended that mixer not be allowed to run longer than three minutes after all materials have been added.
 2. Finish Coat Proportions:
 - a. Trowel Finish (by volume):
 - 1) Lime Putty: 3 Parts.
 - 2) Gypsum Gauging Plaster: 1 Part.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Check lathed areas and furring for defects before proceeding. Do not apply plaster until defects are corrected.

3.2 PREPARATION

- A. Protection: Protect building from damage due to this work.

3.3 INSTALLATION

- A. Tolerances:
 1. Finish plaster true and even, without waves, cracks, or imperfections.
- B. Two Coat Work (Double-up Method):
 1. Install or see that plaster base is properly installed.
 2. Attach grounds and apply screeds.

3. Apply first thickness and double back immediately with second thickness to depth of screeds. Apply first coat with sufficient materials and pressure to form good bond and cover well.
4. Remaining steps are similar to steps '8' through '18' in outline below for applying three coats of work.

C. Three Coat Work:

1. Install or see that plaster base is properly installed. If base is concrete, roughen surface to provide mechanical bond or use bonding agent.
2. Attach grounds.
3. Apply scratch coat approximately **3/16 inch** thick, measured from face of base material. Curl keys around metal lath.
4. Before scratch coat sets, rake and cross rake furrows **1/8 inch** deep, **1/8 inch** wide, and **1/2 to 3/4 inch** apart.
5. Allow scratch coat to set firm and hard.
6. Apply plaster screed, if required.
7. Apply brown coat to depth of screeds twelve hours or more after scratch coat has been applied.
8. Using screeds as guide, straighten surface with rod (straightedge).
9. Fill in hollows or voids and rod surface again.
10. Level and compact surface with darby. Rake and cross rake to receive finish coat.
11. Corners should now be sharply defined and plaster trimmed back and around grounds (corner beads, casing, etc) to allow finish coat to be applied flush with face of ground.
12. Allow brown coat to set hard and firm. Finish coat applied in next operation can be placed over partially dry brown coat or one allowed to dry thoroughly and then wetted evenly by brushing or spraying.
13. Apply finish coat first to angles over partially dry base coat.
14. Straighten angles with rod, or featheredge.
15. Fill surface between angles with 'skim' coat of plaster. Pressure on trowel shall be sufficient to force materials into rough surface of base coat in order to provide contact for bond.
16. Double back on surface immediately with sufficient material to bring finish coat to final thickness.
17. Next, float angles. It may be necessary to apply small additional amount of plaster during floating to fill minor voids that appear in surface.
18. Float and fill depressions ('drawing-up').

D. Trowel Finishes:

1. Allow to 'draw' for a few minutes. When surface becomes dull, proceed with final troweling.
2. Lightly brush surface with water. Trowel immediately after water application. It is important that all possible pressure be applied to trowel in order to compact finish.
3. Rapidly trowel surface without interruption, then repeat troweling operation and continue until plaster has set. Trowel shrinkage cracks that appear before setting action takes place.
4. Finish coats shall be free of blemishes or irregularities.
5. Type of finish as determined by Architect.

3.4 ADJUSTING

- A. Cracked, blistered, pitted, checked, or discolored plaster is not acceptable. Remove such plaster and replace with matching surface.
- B. Do patching for all trades and repair unnecessary damage to plaster occasioned by them at no cost to Owner, making neat job.
- C. Point around steel and iron work, fixtures, outlet boxes, piping, and other appliances abutting or extending into plastering.

3.5 CLEANING

- A. Maintain premises in neat condition. Leave floors broom clean. Clean plaster from stops, beads, trim, etc.

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 as described in Contract Documents, except behind ceramic tile.
- B. Related Requirements:
 - 1. Section 09 3013: 'Ceramic Tile' for installation of backerboard joint reinforcing.

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 C11-15, 'Standard Terminology Relating to Gypsum and Related Building Materials and Systems'.
 - b. ASTM C475/C475M-15, 'Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board'.
 - c. ASTM C840-13, 'Standard Specification for Application and Finishing of Gypsum Board'.
 - d. ASTM C1002-14, '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-13, 'Standard Specification for Coated Glass Mat Water-Resistant Gypsum Backing Panel'.
 - g. ASTM C1396/C1396M-14, 'Standard Specification for Gypsum Board'.
 - h. ASTM E84-15, 'Standard Test Method for Surface Burning Characteristics of Building Materials'.
 - i. ASTM E119-15, 'Standard Test Method for Fire Tests of Building Construction and Materials'.
 - 2. Gypsum Association:
 - a. GA-214-15, 'Recommended Levels of Gypsum Board Finish'.
 - b. GA-216-10: 'Application and Finishing of Gypsum Panel Products'.
 - c. GA-600-15, 'Fire Reference Design Manual'.

- d. GA-801-07, 'Handling and Storage of Gypsum Panel Products: A Guide for Distributors, Retailers, and Contractors'.
3. International Building Code (IBC) (2015 or latest approved version):
 - a. Chapter 25, 'Gypsum Board And Plaster'.
4. 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; (10th Edition).

1.3 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.

1.4 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** and **95 deg F** 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.pabco gypsum.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) 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: match existing adjoining surface thickness.
- 2. Glass Mat Gypsum Tile Backer:
 - a. Product meeting requirements of ASTM C1178/C1178M.
 - b. Type X, **5/8 inch**.
 - 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.
- 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** minimum.
 - 2) Glass Mat Gypsum Tile Backer:
 - a) Wood Framing: **11 ga (0.1233 in)**galvanized with **7/16 inch** head, hot dipped.
Screws: Type W or Type S Hi-Lo, bugle head, rust resistant.

B. Primer / Surfer 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** 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. Butt edges in moderate contact. Do not force in place. Shim to level.
 - d. Leave facings true with joint, finishing flush. Vertical work shall be plumb and ceiling surfaces level.
 - e. 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** of external corners or openings.
 - f. Install board tight against support with joints even and true. Tighten loose screws.
 - 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** minimum from ends and edges, **one inch** maximum from edges, and **1/2 inch** maximum from ends.
 - c. Spacing:
 - 1) Ends: Screws not over **7 inches** on center at edges where blocking or framing occurs.
 - 2) Wood Framed Walls And Ceilings: Screws **7 inches** on center in panel field.
 - d. Set screw heads **1/32 inch** below plane of board, but do not break face paper. If face is accidentally broken, apply additional screw **2 inches** away.
 - e. Screws on adjacent ends or edges shall be opposite each other.
 - f. Drive screws with shank perpendicular to face of board.
 - 4. Finishing:
 - a. General:
 - 1) Tape and finish joints and corners 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** 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** 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** on both sides of joint center. Allow to dry and sand with fine sandpaper or wipe with damp sponge.
- a. Finishing Levels: Finish panels to levels indicated below and according to ASTM C840, GA-214 and GA-216:
- 1) Gypsum Board Surfaces not painted or finished:
 - a) GA-214 Level 1: 'All joints and interior angles shall have tape set in joint compound. Surface shall be free of excess joint compound. Tool marks and ridges are acceptable'.
 - 2) Gypsum Board Surfaces Under Acoustical Tile:
 - a) GA-214 Level 2: 'All joints and interior angles shall have tape embedded in joint compound and wiped with a joint knife leaving a thin coating of joint compound over all joints and interior angles. Fastener heads and accessories shall be covered with a coat of joint compound. Surface shall be free of excess joint compound. Tool marks and ridges are acceptable. Joint compound applied over the body of the tape at the time of tape embedment shall be considered a separate coat of joint compound and shall satisfy the conditions of this level.
 - b) Note: It is critical that gypsum board ceiling be smooth before installing ceiling tile. Drywall joints must be as specified in paragraph above.
 - 3) Gypsum Board Surfaces to Receive: Wall Covering Type A - Section 09 7226: 'Sisal Wall Covering':
 - a) GA-214 Level 3: 'All joints and interior angles shall have tape embedded in joint compound and one additional coat of joint compound applied over all joints and interior angles. Fastener heads and accessories shall be covered with two separate coats of joint compound. All joint compound shall be smooth and free of tool marks and ridges. Coat prepared surface with specified wall covering primer'.
 - 4) Gypsum Board Surfaces to Receive: Acoustic Wall Fabric Type B - Section 09 7216, 'Vinyl-Coated Fabric Wall Covering':
 - 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'.
 - 5) Gypsum Board Surfaces to Receive: Acoustic Wall Covering (Fabric or Carpeting) Type C - Section 09 7313, 'Acoustical Wall Carpeting':
 - 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'.
- 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'.
 - 7) Gypsum Board Surfaces to Receive: Smooth Gypsum Board Surfaces:
 - 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'.
 - 8) Gypsum Board Surfaces to Receive: Multi-Color Coating System - Section 09 9419, 'Interior Multi-Color 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'.
 - 9) Painted, Untextured Gypsum Board Surfaces, Except in Mechanical, Storage, And Utility Areas:
 - a) GA-214 Level 5: 'All joints and interior angles shall have tape embedded in joint compound and two separate coats of joint compound applied over 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. A thin skim coat of joint compound trowel applied, or a material manufactured especially for this purpose and applied in accordance with manufacturer's recommendations, shall be applied to the entire surface. The surface 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** 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.
- 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).

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 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 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-16a, '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-16, '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 F111-15, 'On-Ground or Above-Ground Concrete, Unbonded Mortar Bed, Ceramic Tile'.
 - b. TCNA F115-15, 'On-Ground Concrete, Ceramic Tile, Epoxy or Furan Grout'.
 - c. TCNA F141-15, 'Joists 16 inch o.c./Plywood Subfloor, Unbonded Mortar Bed, Ceramic Tile'.
 - d. TCNA F144-15, 'Joists 16 inch o.c./Plywood, Subfloor, Cement or Giber-Cement, Backer Board, Ceramic Tile'.
 - e. TCNA W211-15, 'Masonry or Concrete, Bonded Mortar Bed, Ceramic Tile'.
 - f. TCNA W221-15, 'Solid Backing, Mortar Bed, Ceramic Tile'.
 - g. TCNA W244c-15, 'Wood or Metal Studs, Cement Backer Board, Ceramic Tile'.
 - h. 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 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.

1.5 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.

1.6 FIELD CONDITIONS

A. Ambient Conditions:

- 1. Keep ambient temperatures of area to receive tile work and surface temperatures of substrates at **50 deg F** 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.

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. Schuler Systems L.P., Plattsburgh, NY www.schluter.com.

B. Design Criteria:**1. General:****a. 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**.
- 3) External and internal corner pieces shall be standard grade.

C. Description:**1. Ceramic Tile:****a. Wall Tile: (match existing)**

- 1) Walls: **4-1/4 inches by 4-1/4 inches**.

D. Materials:**1. 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.

2. 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.

3. Joint Sealants:
 - a. Interior Ceramic Tile Joints are furnished in Section 07 9213 and installed in Section 09 3013 'Ceramic Tiling' including the following:
 - 1) Ceramic and paver cove base inside corners.
 - 2) Ceramic and paver tile joints.
4. Backer Board Joint Reinforcing: 2 inch wide glass fiber mesh tape.
5. Tile Setting Products:
 - a. Use only products of same Manufacturer to validate warranty, unless otherwise acceptable to Ceramic Tile Supplier.
 - b. Use only products that meet Mortar Manufacturer's twenty five (25) year system warranty requirements.
 - c. Latex-Portland Cement Mortar For Floors:
 - 1) Design Criteria:
 - a) Meet ANSI material specification requirements of ANSI 118.4, ANSI 118.11, or ANSI A118.15.
 - b) Meet ANSI installation specification requirements of ANSI A108.4 or ISO material specification ISO13007 installation material specification and . C2ES1P2 performance requirements for adhesive.
 - 2) Category Four Approved Products. See Section 01 62 00 for definitions of Categories:
 - a) ARDEX: Ardex X77.
 - b) CUSTOM: Megalite Crack Prevention Mortar or FlexBond Premium Crack Prevention Thin-set Mortar (no additives needed).
 - c) LATICRETE: 254 Platinum Thinset.
 - d) MAPEI: Ultraflex 3.
 - e) MERKRETE: 735 Premium Flex.
 - d. Latex/Polymer Modified Portland Cement Mortar For Walls:
 - 1) Design Criteria:
 - a) Meet ANSI material specification requirements of ANSI 118.4, ANSI 118.11, or ANSI A118.15.
 - b) Meet ANSI installation specification requirements of ANSI A108.4 or ISO material specification ISO13007 installation material specification and C2ES1P2 performance requirements for adhesive.
 - 2) Category Four Approved Products. See Section 01 6200 for definitions of Categories:
 - a) ARDEX: Ardex X77.
 - b) CUSTOM: Megalite Thin-Set Mortar or FlexBond Fortified Thin-Set Mortar.
 - c) LATICRETE: 254 Platinum Thinset.
 - d) MAPEI: Ultraflex 3.
 - e) MERKRETE: 735 Premium Flex.
 - e. 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.
 - f. 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. Mixes:

- 1. Mortar Beds:

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

* Optional

PART 3 - EXECUTION:

3.1 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.

3.2 PREPARATION

A. Surface Preparation:

- 1. Repair and clean substrate in accordance with installation standards and manufacturer's instructions.

3.3 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. Framed Walls: TCNA W245 with waterproof membrane.
 - b. Masonry Walls: TCNA W211 or W221.
 - c. Tile Cove Base: TCNA Flush style.

C. Tolerances:

- 1. Plane of Vertical Surfaces:
 - a. **1/8 inch in 8 feet** from required plane shall be plumb and true with square corners.

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** 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 Walls:
1. On Mortar Bed Over CMU:
 - a. Apply mortar bed to required thickness of **3/8 inch** minimum to **3/4 inch**.
 - b. Properly cure before installing tile.
 2. On Glass Mat Gypsum Tile Backer Over Framing:
 - a. Embed fiberglass reinforcing tape at joints with mortar used to adhere tile.
 3. Dampen dry backings as determined by environmental conditions and Manufacturer's recommendations to achieve cure.
 4. Allow for sealant joints full height at room corners in wall tile. Insert temporary filler in expansion joints.
 5. Install wall tile directly atop bull-nosed paver tile base.
- F. Application Of Mortar:
1. Do not spread more mortar than can be covered within ten (10) to fifteen (15) minutes:
 - a. If 'skinning' occurs, remove mortar and spread fresh material.
 - b. Spread mortar with notches running in one (1) direction, perpendicular to pressing, pushing and pulling of tile during placement.
 2. Install tile before mortar has started initial cure:
 - a. For thin set mortar application, use notch trowel that will achieve the recommended coverage of mortar after tiles have been installed.
 3. Place tile in fresh mortar, press, push and pull tile slightly to achieve as near 100 percent coverage and contact of tile with setting material and substrate as possible:
 - a. Average contact area shall be not less than eighty (80) percent except on exterior or shower installations where contact area shall be ninety-five (95) percent when not less than three (3) tiles or tile assemblies are removed for inspection. The eighty (80) percent or ninety-five (95) percent coverage shall be sufficiently distributed to give full support of the tile.
 - b. Support corners and edges with mortar leaving no hollow corners or edges.
 4. Install so there is **1/8 inch** of mortar between tile and substrate after proper bedding:
 - a. Periodically remove sheets or individual tiles to assure proper bond coverage consistent with industry specifications.
 - b. If coverage is found to be insufficient, use a larger size notch trowel.
- G. Application Of Grout:
1. Firmly set tile before applying grout:
 - a. This requires forty-eight (48) hours minimum.

2. Before grouting:
 - a. Remove all paper and glue from face of mounted tile.
 - b. Remove spacers or ropes before applying grouting:
 3. Mixing Grout:
 - a. Use clean buckets and mixing tools:
 - 1) Use sufficient pressure and flow grout in progressively to avoid air pockets and voids.
 - b. Machine mixing of grout is preferred to assure uniform blend. To prevent trapping air bubbles into prepared grout, use slow speed mixer.
 - c. Slake for fifteen (15) minutes.
 - d. Water or latex additives used for mixing with dry grout shall be measured accurately.
 4. Before grouting entire area, do a test area to assure there will be no permanent staining or discoloration of tile and to verify that excess grout can be easily removed from tile surface:
 - a. If necessary, pre-coat exposed surfaces of tile with a grout release recommended by Grout Manufacturer to facilitate removal of excess grout.
 5. Installing Grout:
 - a. Use caution, when grouting glazed ceramic tiles to prevent scratching or damaging surface of tile.
 - b. Dampen dry joints prior to grouting with sand-portland cement grout, standard sanded cement grout, standard unsanded cement grout, polymer modified sanded tile grout, and polymer modified unsanded tile grout. Do not leave puddles of water in joints before grouting.
 - c. Keep an adequate joint depth open for grouting. Force maximum amount of grout into joints.
 - d. Apply grout to produce full, smooth grout joints of uniform width, and free of voids and gaps
 - 1) Fill joints of cushion edge tile to depth of cushion.
 - 2) Fill joints of square edge tile flush with surface.
 - 3) Fill joint between wall tile and bull-nosed paver tile base with floor grout.
 - e. Install floor tile with grout thickness of **3/16 inch** maximum.
 - f. Remove excess grout from surface of tile before it loses its plasticity or begins to set.
 - g. Finished grout shall be uniform in color, smooth, and without voids, pin holes, or low spots.
- H. Curing:
1. Keep installation at **65 to 85 deg F** during first eight (8) hours of cure. Shade area completely from sun during this period.
- I. 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.

3.4 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.

3.5 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.

3.6 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. 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** (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 backerboard as described in Contract Documents.
- B. Related Requirements:
1. Section 09 2900: 'Gypsum Board'.

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. Acoustical Tile: Prefinished material with various surface finishes installed in concealed suspension system or adhered to ceiling surface to provide improved sound absorption qualities.
 2. Acoustical Cement/Adhesive: Special type of adhesive or mastic used to stick up or adhere **12 inch x 12 inch** acoustical tile to concrete or gypsum board.
 3. Absorption: Materials that have capacity to absorb sound. Absorption is the opposite of reflection.
 4. Bevel Edge: Acoustical tile is considered bevel edge when face of tile camfered at approximately 45 degree for **1/8 inch to 1/4 inch** around the perimeter of tile.
 5. 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.
 6. Center Line: Line indicating midpoint of surface in either direction. Used as guide in starting ceiling.
 7. 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.
 8. Flame Spread: The propagation of flame over a surface.
 9. 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.
 10. Interior Finish: Interior finish includes interior wall and ceiling finish and interior floor finish.
 11. Kerf: Slit cut into midpoint of edge of tiles.
 12. Light Reflectance (LR): Percentage of light a surface reflected by ceiling surface expressed in decimal form.
 13. Mineral Base: Ceilings composed principally of mineral materials such as fibers manufactured from rock or slab, with or without binders.
 14. Noise Reduction Coefficient (NRC): Average sound absorption coefficient measured at four frequencies: 250, 500, 1,000 and 2,000 Hertz expressed to the nearest integral multiple of 0.05. Rates ability of ceiling or wall panel or other construction to absorb sound. NRC is fraction of

- sound energy, averaged over all angles of direction and from low to high sound frequencies that is absorbed and not reflected.
15. 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.
 16. Sound Absorption: Property possessed by materials and objects, including air, of converting sound energy into heat energy. Sound wave reflected by surface always loses part of its energy. Fraction of energy that is not reflected is called sound absorption coefficient of reflecting surface. For instance, if material reflects 80 percent of sound energy, then sound absorption coefficient would be 20 percent (0.20).
 17. 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.
 18. Textured Pattern: Granular or raised (fine, coarse, or a blend), felted or matted surface as an integral part of the basic product or superimposed on the product surface.
 19. Tile: Acoustical ceiling board, usually **12 inch x 12 inch**, which is stapled, cemented, or suspended by concealed grid system. Edges are often kerfed and cut back.

C. Reference Standards:

1. American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ASHRA):
 - a. ASHRAE Standard 62.1-2013, 'Ventilation for Acceptable Indoor Air Quality'.
2. ASTM International;
 - a. ASTM D1779-98(2011), 'Standard Specification for Adhesive for Acoustical Materials'.
 - b. ASTM E84-15, 'Standard Test Method for Surface Burning Characteristics of Building Materials'.
 - c. ASTM E795-05(2012), 'Standard Practices for Mounting Test Specimens During Sound Absorption Tests'.
 - d. ASTM E1264-14, 'Standard Classification for Acoustical Ceiling Products'.
 - e. ASTM E1414/E1414-11a, 'Standard Test Method for Airborne Sound Attenuation Between Rooms Sharing a Common Ceiling Plenum'.
 - f. ASTM E1477 - 98a(2013), 'Standard Test Method for Luminous Reflectance Factor of Acoustical Materials by Use of Integrating-Sphere Reflectometers'.
3. International Building Code (IBC) (2009 and 2012 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' (2015 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. Manufacturer Installations:
 - a. Published installation recommendations.
- C. Maintenance Material Submittals:
 - 1. Extra Stock Materials:
 - a. Provide Owner with six (2) 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. Passage of 'Room-Corner Test' as recognized by AHJ, is required for system. Adhesive cited in test literature is required for installation of ceiling tile on Project.
 - a. Room Corner Tests:
 - 1) ASTM E84, 'Standard Test Method for Surface Burning Characteristics of Building Materials'.
 - 2) 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 'LDS 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 'LDS 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 LDS - 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** and **86 deg F**
3. Store adhesive on site at installation temperature, between **65 and 90 deg F**, 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** minimum and **100 deg F** maximum.

1.8 WARRANTY

A. Manufacturer Warranty:

1. Provide Manufacturer's system warranty for the following:
 - a. Manufacturer's warranty to be free from defects in materials and factory workmanship.

PART 2 - PRODUCTS

2.1 SYSTEM

A. Manufacturers:

1. Manufacturer Contact List:
 - a. Armstrong World Industries, Strategic Accounts, Lancaster, PA www.armstrong.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.
 - c. USG Inc, Chicago, IL www.usg.com.

B. Materials:

1. Description: (match existing adjoining tile):
 - a. Size: **3/4 inch** thick minimum by **12 inches** 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:
 - 1) Panels meet ASTM E84 or UL 723 Type 1 surface burning characteristics.
 - h. High Recycled Content (HRC): Classified as containing greater than 50 percent total recycled content.
 - i. Light Reflectance (LR): 0.86 Average (Range of 0.84 to 0.88).
 - j. Sag Resistance:
 - 1) Resistance to sagging in high humidity conditions up to, but not including, standing water and outdoor applications.
 - k. Texture: Embossed texture with fine fissuring and small perforations with natural variation in texture and color appearance between tile.
 - l. VOC Emissions:
 - 1) Low formaldehyde: Contributing less than 13.5 ppb in typical conditions per ASHRAE Standard 62, 'Ventilation for Acceptable Indoor Air Quality'.
- 3. Acoustic Tile:
 - a. Category Three National Account Approved Product. See Section 01 6200 for definitions of Categories:
 - 1) DuraTile Item No. MN80377 by Armstrong.

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**.
 - 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.

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** 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** in diameter and **1/8 to 1/4 inch** 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** 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**, plus or minus **1/32 inch**, 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** of each other. No more than **1/16 inch** difference.
 - d. Warp:
 - 1) Tiles specification is plus or minus **0.050 inch** 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 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 07 9213: 'Elastomeric Joint Sealants' for quality of Elastomeric Joint Sealants.
 - 2. Sections under 09 9000 heading 'Paints and Coatings'.
 - a. Pre-Installation conferences held jointly with Section 09 9001.

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

1.3 SUBMITTALS

- A. Action Submittals:
 - 1. Product Data:
 - a. Include following information for each painting product, arranged in same order as in Project Manual.
 - 1) 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>.
 - 2) Confirmation of colors selected and that each area to be painted or coated has color selected for it to match adjoining surfaces.
- B. Informational Submittals:
 - 1. Manufacturer Instructions:
 - a. Manufacturer's substrate preparation instructions and application instruction for each painting system used on Project.
- C. 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.

1.4 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. Maintain qualified crew of painters throughout duration of the Work.

1.5 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** minimum.

1.6 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.

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. 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 as described in Contract Documents, including but not limited to following items.
 - 1. Finish casework and wood trims that are specified to be installed under Section 06 2001 and that are not called out to be factory-or shop-finished. Back prime wood elements to be installed against concrete or masonry or that may be subjected to moisture.

- C. Apply sealant in gaps **3/16 inch** (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 9122**INTERIOR PAINTED CMU****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
 - 1. Preparing and painting new and painting existing interior CMU surfaces as described in Contract Documents.
- B. Related Requirements:
 - 1. Section 09 9001: 'Common Painting And Coating Requirements':

1.2 ADMINISTRATIVE REQUIREMENTS

- A. Pre-Installation Conferences:
 - 1. Participate in pre-installation conference as specified in Section 09 9001.

PART 2 - PRODUCTS**2.1 SYSTEM**

- A. Manufacturer:
 - 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. Rest Rooms, And Custodial Rooms:
 - a. New Surfaces: Use MPI(a) INT 4.2F Waterborne Epoxy Finish system.
 - b. Previously Finished Surfaces: Use MPI(r) RIN 4.2E Waterborne Epoxy Finish system.
 - 2. All Other:
 - a. New Surfaces: Use MPI(a) INT 4.2D Latex Finish system.
 - b. Previously Finished Surfaces: Use MPI(r) REX 4.2H 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 finish requirements.
 - d. Gloss / Sheen Level Required: Gloss Level 5.
- D. Materials:
 - 1. Block Filler, Over New Masonry Only: MPI Product 4: 'Block Filler, Latex, Interior/Exterior'.
 - 2. Finish Coats: 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. Existing Painted Surfaces:
 - 1. Remove deteriorated existing paint by scraping or sanding. Wash surfaces that have been defaced with marking pens, crayons, lipstick, etc, with solvent recommended by Paint Manufacturer. Spot prime such surfaces.
 - 2. Sand areas of existing sound paint if necessary for bonding of new paint system. Clean existing painted surfaces, sanded or not, with mild soap and water, or with tri-sodium phosphate (TSP).
 - 3. Fill large holes with patching and small holes and cracks with spackle.
 - 4. Apply one coat primer to scraped and sanded areas.
 - 5. Apply one finish coat. Completely cover voids in masonry block but do not fill.

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 and existing interior gypsum board and plaster surfaces as described in Contract Documents:
- B. Related Requirements:
 - 1. Section 09 9001: 'Common Painting And Coating Requirements':

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, And Custodial 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.
 - 2) Remaining Painted Surfaces: Gloss Level 5.
- D. Materials:
 - 1. Primers:
 - a. MPI Product 50, 'Primer Sealer, Latex, Interior'.
 - 2. Finish Coats:
 - a. Rest Rooms, 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)'.
 - 2) Buildings with CMU and Gypsum Board surfaces in same rooms:
 - a) MPI Product 77, 'Epoxy, Gloss'.
 - b. 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 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 as described in Contract Documents.
- B. Related Requirements:
 - 1. Section 06 2210: 'Miscellaneous Wood Trim'.
 - 2. Section 06 4114: 'Wood-Veneer-Faced Architectural Cabinets'.
 - 3. Section 06 4512: 'Architectural Woodwork Wood Trim'.
 - 4. Section 09 9001: 'Common Painting And Coating Requirements':
 - a. Pre-installation conference for Sections under 09 9000 heading 'Paints and Coatings'.
 - b. 'Attachment: Paint Color Schedule' for O&M / R&I Projects.

1.2 REFERENCES

- A. Association Publications:
 - 1. Architectural Woodwork Institute / Architectural Woodwork Manufacturers Association of Canada, 46179 Westlake Drive, Suite 120, Potomac Falls, VA www.awinet.org.
 - a. Architectural Woodwork Standards (AWS), 1st Edition, 2009.
- B. Reference Standards:
 - 1. Kitchen Cabinet Manufacturers Association / American National Standards Institute:
 - a. ANSI/KCMA A161.1-2000 (R2005) 23-Jan-2001 'Recommended Performance and Construction Standards for Kitchen and Vanity Cabinets.'

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.

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. Stain: MPI 90, 'Stain, Semi-Transparent, for Interior Wood'.
2. 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.
3. Color:
 - a. Design Criteria:
 - 1) Finish to match existing selected sample.

B. Performance:

1. Design Criteria: General: See appropriate paragraphs of Section 09 9001.

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. Softwood Components:

1. Where Douglas Fir serves as a component part (shelves, backs, etc) of hardwood cabinets, use same specification as for hardwood finish, but as sufficient 1:1 mix of sanding sealer / Mineral spirits with stain to make color of Pine or Douglas Fir grains approximate color of finish hardwood.
2. Coat interior surfaces of Drawers with one (1) coat high gloss urethane varnish.

END OF SECTION

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. Furnish and install sealants relating to installation of systems installed under this Division.
 - 3. 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. Division 33: 'Utilities' for piped utilities.
 - 4. 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.
- 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.
- 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 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 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. Use domestic made pipe and pipe fittings on Project.
- C. 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 will permit.
 - 2. Consider Architectural 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. Demolition Requirements:

1. Existing galvanized culinary water piping from the existing 2" meter to the building is to be removed and replaced.
2. Existing galvanized culinary water piping within the building is to be removed and replaced.
 - a. Existing piping that is located within walls, floors or above finished ceilings that do not require demolition for installation of new piping may be abandoned in place.

3.4 INSTALLATION

- A. Cut carefully to minimize necessity for repairs to previously installed or existing work. Do not cut beams, columns, or trusses.
- B. Locating Equipment:
 1. Arrange pipes to permit ready access to valves, unions, and to clear openings of doors and access panels.
 2. Adjust locations of pipes to accommodate work and 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) Existing piping that is not being replaced shall have right-of-way. For example, plumbing drains, heating piping and gas piping shall have right-of-way.
 - 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.
- C. Penetration Firestops:
 1. Install Penetration Firestop System appropriate for penetration at plumbing systems penetrations through walls, ceilings, roofs, and top plates of walls.
- D. 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.
- E. 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 at each branch from mains.
 - 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** 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. Cut piping accurately to measurements established at site. Remove burr and cutting slag from pipes.
 4. Work piping into place without springing or forcing. Make piping connections without strain at piping connection. Remove bolts in flanged connections or disconnect piping to demonstrate that piping has been so connected, if requested.

5. Make changes in direction with proper fittings.
 6. Expansion of Thermoplastic Pipe:
 - a. Provide for expansion in every 30 feet of straight run.
 7. Expansion of PEX Pipe: Allow for expansion and contraction of PEX pipe as recommended by Pipe Manufacturer.
- F. Sleeves:
1. 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.
 2. Sleeves through floors shall extend 1/4 inch above floor finish in mechanical equipment rooms above basement floor. In other rooms, sleeves shall be flush with floor.
 3. Sleeves through floors and foundation walls shall be watertight.
- G. 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.

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. Slots and openings through floors, walls, ceilings, and roofs provided under other Divisions in their respective materials.
- C. Existing Hangers and Supports:
 - 1. Existing hangers for removed piping may be reused.
 - a. Insulate copper piping from steel hangers.
 - b. Where replacement piping requires supports on closer spacing than existing supports, new hangers and supports shall comply with this section.

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. Hangers shall have double nuts.
 - 1) Support insulated pipes **2 inches** 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 uninsulated copper pipe **2 inches** 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.
- 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

- d. Riser Clamps For Vertical Piping:
- 1) Type Two Acceptable Products:
 - a) Anvil Fig. 261.
 - b) Equals by Cooper B-Line.

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 slab or structure above 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** on center maximum for pipe **1-1/4 inches** or larger and **72 inches** on center maximum for pipe **1-1/8 inch** or less.
 - 2) Support thermoplastic pipe at **48 inches** on center maximum.
 - 3) Support PEX pipe at **32 inches** 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. Install supports from inserts cast into concrete floor system, including concrete joists and floor slabs. Where inserts cannot be used, provide expansion shields and support hangers from angles held in place by expansion bolts, never directly from expansion bolt itself. Provide calculations necessary to determine number of expansion bolts required to equal capacity of cast-in-place insert.
 - e. Insulate hangers for copper pipe from piping by means of at least two layers of Scotch 33 plastic tape.

END OF SECTION

SECTION 22 0553

IDENTIFICATION FOR PLUMBING PIPES AND EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Includes But Not Limited To:
 - 1. Furnish and install identification of plumbing piping as described in Contract Documents.

PART 2 - PRODUCTS

2.1 SYSTEM

- A. Materials:
 - 1. Paint:
 - a. One Coat Primer:
 - 1) 6-2 Quick Drying Latex Primer Sealer over fabric covers.
 - 2) 6-205 Metal Primer under dark color paint.
 - 3) 6-6 Metal Primer under light color paint.
 - b. Finish Coats: Two coats 53 Line Acrylic Enamel.
 - c. Performance Standard: Paints specified are from Pittsburgh Paint & Glass (PPG), Pittsburgh, PA www.pittsburghpaints.com or PPG Canada Inc, Mississauga, ON (800) 263-4350 or (905) 238-6441.
- B. Painting:
 - 1. Only painted legends, directional arrows, and color bands are acceptable.
 - 2. Locate identifying legends, directional arrows, and color bands at following points on exposed piping of each piping system:
 - a. At point of entry and exit where piping goes through wall.
 - b. On each riser and junction.
 - c. Every **25 feet** on long continuous lines.
 - d. Stenciled symbols shall be one inch high and black.

2.2 ATTACHMENTS

- A. Schedules:
 - 1. Pipe Identification Schedule:
 - a. Apply stenciled symbols as follows:

Pipe Use	Abbreviation
Domestic Cold Water	CW
Domestic Hot Water	HW

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'.
- C. Copper piping and fiberglass insulation is required on all piping installed in the supply and return air tunnels.

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
140 - 160 Deg F	1/2 In	One In	
45 - 130 Deg F	1/2 In	1/2 In	
 - 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. Pex Piping, Above And Below Grade:
 - a. Insulation:
 - 1) **1/2 inch** 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)
3. PP-R Piping, Above And Below Grade:
 - a. Insulation:
 - 1) **1/2 inch** 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.

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** Diameter:
 - a. Adhere 'factory applied vapor barrier jacket lap' smoothly and securely at longitudinal laps with white vapor barrier adhesive.
 - b. Adhere **3 inch** wide self-sealing butt joint strips over end joints.
 4. Piping **1-1/2 inches** 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. 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.
 - b. Piping Up To **1-1/4 Inch** 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** wet coats of vapor barrier mastic reinforced with glass fabric extending **2 inches** onto adjacent insulation.
 - c. Piping **1-1/2 inches** To **2 Inches**:

- 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.
6. Pipe Hangers:
- a. Do not allow pipes to come in contact with hangers.
 - b. Pipe Shield:
 - 1) Provide 16 ga by 6 inch long galvanized shields at each pipe hanger to protect pipe insulation from crushing by clevis hanger.
 - 2) Provide 22 ga by 6 inch long galvanized shield at each pipe hanger to protect insulation from crushing by Unistrut type hanger.
- 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 to existing meter as described in Contract Documents.
 - a. Reconnect to irrigation system piping between meter and building.
- B. Related Requirements:
 - 1. Section 22 0501: 'Common Piping Requirements'.
 - 2. Section 22 0719: 'Plumbing Piping Insulation'.
 - 3. Section 31 2316: 'Excavation' for criteria for performance of excavation.
 - 4. Section 31 2323: 'Fill' for criteria for performance of backfill.
 - 5. Section 33 1116: 'Site Water Utility Distribution Piping' for domestic water piping from **5 feet** from building perimeter to main.

1.2 REFERENCES

- A. Reference Standards:
 - 1. American National Standards Institute / American Society of Sanitary Engineers:
 - a. ANSI/ASSE 1003-2009, '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 B88-14, 'Standard Specification for Seamless Copper Water Tube'.
 - b. ASTM E84-15b, 'Standard Test Method for Surface Burning Characteristics of Building Materials'.
 - c. ASTM F876-15a, 'Standard Specification for Crosslinked Polyethylene (PEX) Tubing'.
 - d. ASTM F877-11a, 'Standard Specification for Crosslinked Polyethylene (PEX) Hot- and Cold-Water Distribution Systems'.
 - e. ASTM F1807-15, '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 F2389-15, 'Standard Specification for Pressure-rated Polypropylene (PP) Piping Systems'.
 - 4. NSF International Standard:
 - a. NSF P171, 'Protocol for Chlorine Resistance of Plastic Piping Materials' (1999).
 - 5. NSF International Standard / American National Standards Institute:
 - a. NSF/ANSI 14-2015, 'Plastic Piping System Components and Related Materials'.
 - b. NSF/ANSI 61-2015, 'Drinking Water System Components - Health Effects'.
 - c. NSF/ANSI 372-2016, 'Drinking Water System Components - Lead Content'.

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Qualifications:
 - 1. Manufacturer Qualifications:
 - a. PP-R pipe:
 - 1) Certified by NSF International.
 - 2. Installers Qualifications:
 - a. PP-R pipe:
 - 1) Certified by Manufacturer.

1.4 SUBMITTALS

- A. Action Submittals:
 - 1. Product Data:
 - a. Manufacturer's Literature:
 - 1) PEX pipe and PEX pipe fittings.
 - 2) PP-R pipe and PP-R pipe fittings.
 - 2. 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.

1.6 SYSTEMS

- A. Manufacturers:
 - 1. Manufacturer Contact List:
 - a. Aquatherm, Inc., Lindon, UT www.aquathermpipe.com.
 - b. Cash Acme, Cullman, AL www.cashacme.com
 - c. Cla-Val Company, Costa Mesa, CA or Cla-Val Canada Ltd, Beamsville, ON www.cla-val.com.
 - d. Conbraco Industries Inc, Matthews, NC www.conbraco.com or Conbraco (Honeywell Ltd), Scarborough, ON (416) 293-8111.
 - e. Hammond Valve, New Berlin, WI www.hammondvalve.com.
 - f. 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.
 - g. Harris Products Group, Cincinnati, OH www.harrisproductsgroup.com.
 - h. Honeywell Inc, Minneapolis, MN www.honeywell.com.
 - i. Leonard Valve Co, Cranston, RI www.leonardvalve.com.
 - j. Milwaukee Valve Co, New Berlin, WI www.milwaukeevalve.com.
 - k. Nibco Inc, Elkhart, IN www.nibco.com.
 - l. Rehau, Leesburg, VA www.rehau-na.com.
 - m. Sloan Valve Co, Franklin Park, IL www.sloanvalve.com.
 - n. Spence Engineering Co, Walden, NY www.spenceengineering.com.
 - o. Symmons Industries, Braintree, MA www.symmons.com.
 - p. Uponor Inc, Apple Valley, MN www.uponor-usa.com.
 - q. Viega ProPress, Wichita, KS www.viega-na.com.

- r. Watts Regulator Co, Andover, MA www.wattsreg.com.
- s. Wilkins (Zurn Wilkins), Paso Robles, CA www.zurn.com.
- t. 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) **2 inches** And Smaller: Annealed soft 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 at 73 deg F**, **100 psi at 180 deg F**, and **80 psi at 200 deg F**.
 - 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.
 - c. Polypropylene-Random (PP-R):
 - 1) Above-Grade:
 - a) Meet requirements of ASTM F2389 and be certified by NSF International per ASTM F2389, NSF/ANSI 14, and NSF/ANSI 61.
 - b) SDR 7.4 Greenpipe faser for domestic hot water and SDR 7.4 or SDR 11 greenpipe for domestic cold water. Aquatherm Lilac SDR 11 purple piping for recycled/reclaimed water systems.
 - 2) Below-Grade:
 - a) Meet requirements of ASTM F2389 and be certified by NSF International per ASTM F2389, NSF/ANSI 14, and NSF/ANSI 61.
 - b) SDR 7.4 Greenpipe faser for domestic hot water and SDR 7.4 or SDR 11 greenpipe for domestic cold water. Aquatherm Lilac SDR 11 purple piping for recycled/reclaimed water systems.
 - 3) Category Four Approved Products. See Section 01 6200 for definitions of Categories:
 - a) Aquatherm Greenpipe, Greenpipe faser, and Lilac by Aquatherm.
- 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.
 - c. For PP-R Pipe:
 - 1) Category Four Approved Products. See Section 01 6200 for definitions of Categories:
 - a) Greenpipe by Aquatherm.
- 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. Connections For PP-R Pipe:
 - a. Above-Grade:
 - 1) Socket-fusion, fusion-outlet, electrofusion, butt welding, and mechanical transition fittings including threaded adapters, groove adapters, and flanges.
 - b. Below-Grade:
 - 1) All joints shall be fusion-welded PP-R except that flanges may be used when connecting to other piping systems. Mechanical fittings shall not be used below grade.
 - 2) Joints under slabs acceptable only if allowed by local codes.
- 6. 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** SWP.
 - 1) Operate with flow in either direction, suitable for throttling and tight shut-off.
 - 2) Body: Bronze, **150 psig** wsp at **350 deg F** and **400 psig** wog.
 - 3) Seat: Bubble tight at **100 psig** under water.
 - c. Class One Quality Standard: Nibco T585 or S585.
 - 1) Equal by Conbraco 'Apollo,' Hammond, Milwaukee, or Watts.
 - d. PP-R piping if used:
 - 1) Category Four Approved Products. See Section 01 6200 for definitions of Categories:
 - a) PP-R fusion-weld ball valves by Aquatherm.
- 7. Tempering Valve MV-1:
 - a. Solid bronze body construction.
 - b. Includes integral check valves and inlet screen. Features advanced paraffin-based actuation technology.
 - c. Flow of **4 GPM** with maximum **10 psi** pressure drop. Perform to minimum flow of **0.5 GPM** in accordance with ASSE 1016, ASSE 1017, & ASSE 1070.
 - d. Set for **110 deg F** Service.
 - e. $\frac{1}{2}$ " size.
 - f. Acceptable Manufacturers: Lawler, Leonard, Powers, Sloan, Symmons, and Watts.

PART 2 - EXECUTION

2.1 INSTALLATION

- A. Locate cold water lines a minimum of **6 inches** from hot water line.

2.2 FIELD QUALITY CONTROL

- A. Field Tests:
 - 1. Before pipes are covered, test systems in presence of Architect/Engineer at **125 psig** hydrostatic pressure for four (4) hours and show no leaks.
 - 2. Disconnect equipment not suitable for **125 psig** pressure from piping system during test period.
 - 3. PP-R Piping:

- a. Test in accordance with Manufacturer's instructions prior to covering.
 - 1) Provide documentation.

2.3 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 1119**DOMESTIC WATER PIPING SPECIALTIES****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
 - 1. Furnish and install miscellaneous potable water piping specialties as described in Contract Documents.
- B. Related Requirements:
 - 1. Section 22 0501: 'Common Plumbing Requirements'.

1.2 REFERENCES

- A. Reference Standards:
 - 1. NSF International Standard / American National Standards Institute:
 - a. NSF/ANSI 61-2012, 'Drinking Water System Components - Health Effects'.
 - b. NSF/ANSI 372-2011, '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.

PART 2 - PRODUCTS**2.1 ACCESSORIES**

- A. Manufacturers:
 - 1. Manufacturer Contact List:
 - a. Ashcroft, Stratford, CT www.ashcroftinc.com.
 - b. H O Trelice, Oak Park, MI www.hotco.com.
 - c. Josam Co, Michigan City, IN www.josam.com.
 - d. Jay R. Smith Manufacturing Co, Montgomery, AL www.jrsmith.com.
 - e. Prier Products, Inc., Grandview, MD www.prier.com.
 - f. Wade (Division of Tyler Pipe), Tyler, TX www.wadedrains.com.
 - g. Watts Drainage, Spindale, NC www.watts.com or Watts Industries, Burlington, ON, Canada www.wattscda.com.
 - h. Weiss Instruments, Inc., Holtsville, NY www.weissinstruments.com.
 - i. Woodford Manufacturing, Colorado Springs, CO www.woodfordmfg.com.
 - j. Zurn Cast Metals, Erie, PA or Zurn Industries Limited, Mississauga, ON www.zurn.com.
- B. Materials:
 - 1. Exterior Hydrants:
 - a. Design Criteria:
 - 1) Provide with integral anti-siphon device. Key-operated.
 - 2) Non-freeze.

- 3) Not required to meet NSF International Standards for Lead Free.
- b. Category Four Approved Products. See Section 01 6200 for definitions of Categories:
 - 1) Josam: 71050.
 - 2) Jay R. Smith: 5609-QT.
 - 3) Prier: C-634.
 - 4) Wade: W-8600.
 - 5) Watts: HY-725.
 - 6) Woodford: 67.
 - 7) Zurn: Z-1310.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Exterior hydrants to be sealed in concrete foundation walls with grout, installed flush with face of wall. Repair plaster wall finish.

END OF SECTION

SECTION 22 3305**ELECTRIC DOMESTIC WATER HEATERS****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
 - 1. Furnish and install electric water heater as specified in Contract Documents.
- B. Related Requirements:
 - 1. Section 22 0501: 'Common Plumbing Requirements'.
 - 2. Section 22 1116: 'Domestic Water Piping'.

1.2 REFERENCES

- A. Reference Standard:
 - 1. NSF International Standard / American National Standards Institute:
 - a. NSF/ANSI 61-2012, 'Drinking Water System Components - Health Effects'.
 - b. NSF/ANSI 372-2011, 'Drinking Water System Components - Lead Content'.

1.3 SUBMITTALS

- A. Closeout Submittals:
 - 1. Include following in Operations And Maintenance Manual specified in Section 01 7800:
 - a. Operations and Maintenance Data:
 - 1) Maintenance and operational instructions.
 - b. Warranty Documentation:
 - 1) Final, executed copy of Warranty.
 - c. Record Documentation:
 - 1) Manufacturers documentation:
 - a) Manufacturer's literature or cut sheet.

1.4 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.

1.5 WARRANTY

- A. Special Warranty:
 - 1. 6 year parts and 10 year tank non-prorated warranty.

PART 2 - PRODUCTS

2.1 ASSEMBLIES

- A. Manufacturers:
 - 1. Manufacturer Contact List:
 - a. Bradford-White Corp, Ambler, PA www.bradfordwhite.com.
 - b. Rheem / Ruud Water Heater Div Rheem Manufacturing, Atlanta, GA www.rheem.com or Rheem Canada Inc Water Heater Division, Hamilton, ON (800) 268-6966 or (905) 527-9194.
 - c. Ruud Manufacturing Co., Atlanta, GA www.ruud.com.
- B. Materials:
 - 1. Design Criteria:
 - a. All (wetted) drinking water products, components, and materials used in drinking water systems must meet NSF International Standards for Lead Free.
 - 2. **6 - 12 Gallon:**
 - a. Glass lined storage tank pressure tested and rated for **125 psi** working pressure.
 - b. 110-120 V, single phase, 1500 –1650 watts maximum heating capacity.
 - c. Water heaters shall each have ASME rated temperature-pressure relief valve rated at MBH input of heater minimum set to relieve at **120 psi**.
 - d. Complete with thermostat, high limit control, and anode rod.
 - e. Category Four Approved Products. See Section 01 6200 for definitions of Categories:
 - 1) Bradford White: RE112WV6.
 - 2) Rheem: EGSP10.

2.2 ACCESSORIES

- A. Anchoring Components:
 - 1. Provide heater with manufacturers wall hanging bracket or kit.
- B. Thermal Expansion Absorbers:
 - 1. Bladder type for use with potable water systems.
 - 2. Type One Acceptable Products.
 - a. Therm-X-Trol ST-2-C by Amtrol Inc, West Warwick, RI www.amtrol.com.
 - b. Equal as approved by Architect before bidding. See Section 01 6200.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install temperature-pressure relief valve on hot water heater and pipe discharge to directly above Mop Sink..
- B. Anchor to wall in compliance with manufacturers installation instructions.

3.2 ADJUSTING

- A. Set discharge water temperature at **140 deg F**. Final hot water temperature at Lavatories to be **110 deg F** after tempering valve.

END OF SECTION

SECTION 22 3423**GAS DOMESTIC WATER HEATERS****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
 - 1. Furnish and install gas-fired storage type water heater as described in Contract Documents.
- B. Related Requirements:
 - 1. Section 22 0501: 'Common Plumbing Requirements'.
 - 2. Section 22 1116: 'Domestic Water Piping'.

1.2 REFERENCES

- A. Reference Standards:
 - 1. CSA Group / American National Standards Institute:
 - a. CSA ANSI Z21.22-99(R08)/CSA 4.4-M99(R08), 'Relief Valves for Hot Water Supply Systems'.
 - 2. NSF International Standard / American National Standards Institute:
 - a. NSF/ANSI 61-2012, 'Drinking Water System Components - Health Effects'.
 - b. NSF/ANSI 372-2011, 'Drinking Water System Components - Lead Content'.

1.3 SUBMITTALS

- A. Closeout Submittals:
 - 1. Include following in Operations And Maintenance Manual specified in Section 01 7800:
 - a. Operations and Maintenance Data:
 - 1) Maintenance and operational instructions.
 - b. Warranty Documentation:
 - 1) Final, executed copy of Warranty.
 - c. Record Documentation:
 - 1) Manufacturers documentation:
 - a) Manufacturer's literature or cut sheet.

1.4 QUALITY ASSURANCE

- A. Regulatory Agency Sustainability Approvals:
 - 1. Seismic Anchoring System:
 - a. Seismic Design Category (SDC) shall be determined by Project Structural Engineer.
 - 2. 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.

1.5 WARRANTY

- A. Manufacturer Warranty:
 - 1. Six-year tank and parts warranty.

PART 2 - PRODUCTS

2.1 EQUIPMENT

A. Manufacturers:

1. Manufacturer Contact List:
 - a. American Water Heater Co, Johnson City, TN www.americanwaterheater.com.
 - b. A O Smith Water Products Co, Ashland City, TN www.hotwater.com or A O Smith Enterprise Ltd, Stratford, ON (800) 265-8520 or (519) 271-5800.
 - c. Bradford White Corp, Ambler, PA www.bradfordwhite.com.
 - d. Rheem Water Heating, Montgomery, AL www.rheem.com.
 - e. State Industries Inc, Ashland City, TN www.stateind.com.

B. Materials:

1. Design Criteria:
 - a. All (wetted) drinking water products, components, and materials used in drinking water systems must meet NSF International Standards for Lead Free.
2. Standard Water Heaters:
 - a. Glass lined storage tank, pressure tested and rated for 150 psi w.p complete with thermostat, high limit control, gas valve, gas pressure regulator, 100 percent safety shut-off, and draft diverter. AGA approved.
 - b. Water heaters shall each have temperature-pressure relief valve sized to match heat input and set to relieve at **120 psi**.
 - c. **50 Gallon** (Standard Type):
 - 1) Category Four Approved Manufacturers. See Section 01 6200 for definitions of Categories:
 - a) American.
 - b) A O Smith.
 - c) Bradford-White.
 - d) State Industries.

2.2 ACCESSORIES

A. Anchoring Components:

1. **Two one inch by 18 ga** galvanized steel straps.
2. 5/16" expansion anchors in concrete wall.

B. Thermal Expansion Absorbers:

1. Bladder type for use with potable water systems.
2. Type One Acceptable Products:
 - a. Therm-X-Trol ST-12 by Amtrol Inc, West Warwick, RI www.amtrol.com.
 - b. Equal as approved by Architect before bidding. See Section 01 6200.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install temperature-pressure relief valve on hot water heater and pipe discharge to directly above funnel of floor drain.
- B. Anchor water heaters to wall using two anchoring straps and specified screws.
 1. Anchors shall be installed with one on vertical upper 1/3 and one on lower 1/3 of water heater.
 2. Anchor straps to concrete wall with 5/16" expansion anchor bolts.
- C. Provide and install any new gas flue fittings required to connect to existing flue.

- D. Provide and install new flex gas piping from existing gas line to water heater connection.

3.2 ADJUSTING

- A. Set discharge water temperature at 140 deg F or as indicated on Contract Drawings.

END OF SECTION

SECTION 22 4213**COMMERCIAL WATER CLOSET SUPPLIES****GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
 - 1. Removal and replacement of existing water closets as required to replace culinary piping to the fixtures.
 - 2. Furnish and install plumbing new stops and supplies as described in Contract Documents.
- B. Related Requirements:
 - 1. Section 22 0501: 'Common Plumbing Requirements'.
 - 2. Section 22 1116: 'Domestic Water Piping'.

PART 2 - PRODUCTS**2.1 ASSEMBLIES**

- A. Manufacturers:
 - 1. Manufacturer Contact List:
 - a. McGuire Manufacturing Co, Cheshire, CT www.mcguiremfg.com.
 - b. Zurn Industries, LLC, Erie PA www.zurn.com. or Zurn Industries Ltd, Mississauga, ON (905) 795-8844.
- B. Performance:
 - 1. Design Criteria:
 - a. Interior exposed pipe, valves, and fixture trim, including trim behind custom casework doors, shall be chrome plated.
 - b. All materials NOT required to be low lead compliant.
 - c. Supply Pipe And Stop:
 - 1) Provide chrome plated quarter-turn brass ball valve, **12 inch** 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. Provide each individual fixture supply with accessible chrome-plated stop valve.

3.2 CLEANING

- A. Polish chrome finish at completion of Project.

END OF SECTION

SECTION 22 4216**COMMERCIAL LAVATORY, SINK AND FOUNTAIN SUPPLIES****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
 - 1. Removal and replacement of existing Lavatories, Sinks and Drinking Fountains as required to replace culinary water piping to the fixtures.
 - 2. Furnish and install new stops and supplies 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 Society of Mechanical Engineers / Canadian Standards Association (CSA Group):
 - a. ASME A112.18.1-2012/CSA B125.1-12, 'Plumbing Supply Fittings'.
 - 2. NSF International Standard / American National Standards Institute:
 - a. NSF/ANSI 61-2015, '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.

1.4 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. Dearborn Brass, Tyler, TX www.dearbornbrass.com.
 - b. Engineered Brass Co. (EBC) (Just Manufacturing Co.), Franklin Park, IL www.justmfg.com.
 - c. McGuire Manufacturing Co, Cheshire, CT www.mcguiremfg.com.
 - d. Zurn Commercial Brass, Sanford, NC www.zurn.com or Zurn Industries Ltd, Mississauga, ON (905) 795-8844.

- B. Performance:
1. Design Criteria:
 - a. Interior exposed pipe, valves, and fixture trim, including trim behind custom casework doors, shall be chrome plated.
 - b. Lavatory Fittings:
 - 1) 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 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.
 - 2) 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. Seal wall-mounted fixtures around edges to wall and counter top fixtures to countertop with sealant specified in Section 07 9213.
- B. Unless otherwise noted, provide each individual fixture supply with chrome-plated stop valve.
- C. Install fixtures with accessible stop or control valve in each hot and cold water branch supply line.
- D. Install Safety Covers on all under sink / lavatories with exposed water supply pipes and traps.

3.2 CLEANING

- A. Polish chrome finish at completion of Project.

END OF SECTION