PROJECT MANUAL
including Specifications

(STAKE SUITE REMODEL)

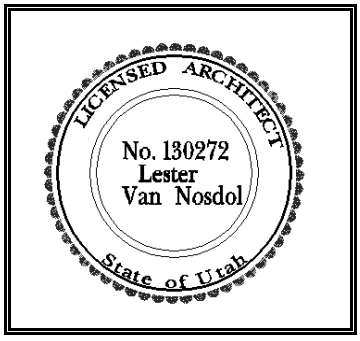
FOR

CASCADE 1, 2

481 E. Center St.
Orem, UT 84097

Property No.
51308911702010101

March 2017



Prepared By:

RVA ARCHITECTS, INC.

32 West Center St. Suite #203
Provo, Utah 84601
(801) 374-2100

PROJECT DIRECTORY

Owner:	Corporation of the Presiding Bishop of the Church of Jesus Christ of Latter-day Saints A Utah Corporation Sole 50 East North Temple Street Salt Lake City, UT 84150
Project Manager:	American Fork Project Management Office 110 E. Main St. American Fork, UT 84003 801-763-4520
Facilities Manager:	Orem Central FM Group 140 North 400 West Orem, UT 84097 801-222-3130
Architects:	RVA Architects, Inc. 32 West Center St. #203 Provo, UT 84601 801-374-2100

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INVITATION TO BID (U.S.)

1. **CONTRACTORS INVITED TO BID THE PROJECT:**

BC Builders	**Majestic Builders**
Broderick & Henderson	**Oasis Builder**
Dynamic Construction	**SRFCO**
Gines Construction	**Warner Construction**

2. **PROJECT:**
   Cascade 1, 2 Stake Suite Remodel

3. **LOCATION:**
   481 E. Center St.
   Orem, UT

4. **OWNER:**
   Corporation of the Presiding Bishop of
   The Church of Jesus Christ of Latter-day Saints,
   A Utah Corporation Sole
   50 East North Temple Street
   Salt Lake City, Utah 84150

5. **CONSULTANT:**
   RVA Architects, Inc.
   32 W. Center St. #203
   Provo, UT 84601
   801-374-2100

6. **DESCRIPTION OF PROJECT:**

   A. Remodel interior Stake Suite.

   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. **PRE-BID CONFERENCE**: A pre-bid conference will be held on **Thursday, March 30, 2017** @ **11:00 am** at the site located at 481 E. Center St. Orem, UT.

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

9. **TIME OF SUBSTANTIAL COMPLETION:** The time limit for substantial completion of this work will be 45 calendar days and will be as noted in the Agreement.

10. **BID OPENING:** Sealed bids will be accepted until **3:00 pm, Thursday, April 13, 2017**. Bids will be publicly opened at that time at the American Fork PM office located at 110 East Main Street American Fork, UT.

11. **BIDDING DOCUMENTS:**

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

       1. **Mountainlands Area Plan Room**
          3560 South 583 West, Suite 4
          Salt Lake City, UT 84115
          801-288-1188
          www.mapronline.com

2. McGraw Hill/Dodge Area Plan Room
http://dodgeprojects.construction.com

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

13. 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 may be held 11:00 am, Thursday, March 30, 2017 at the job site located at 481 E. Center St. Orem, UT.

B. Examination Schedule for Existing Building and Site
   1) Lynn Adams @ 801-222-3130

END OF DOCUMENT

INFORMATION AVAILABLE TO BIDDERS (U.S.)

1. ASBESTOS-CONTAINING MATERIAL (ACM)

A. The building upon which work is being performed will be examined for asbestos. If any asbestos containing material is found Owner will coordinate remediation efforts prior to Notice to Proceed.

END OF DOCUMENT

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: Cascasde 1, 2

Building Plan Type: Stake Suite Remodel

Building Address: 481 E. Center St. Orem, UT

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

Project Number: 513089117020101

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:	513089117020101
Property Address ("Project Site"):	481 E. Center St. Orem, UT
Project Type:	Stake Suite Remodel
Project Name ("Project"):	Cascade 1, 2
Stake Name:	Orem, UT Cascade

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 02,03,04,05,06,07,08,09,10,23,26,);
   d. Drawings entitled and dated Cascade 1, 2 Stake Suite Remodel;
   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 Forty Five (45) 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:	**CONTRACTOR:**
Corporation of the Presiding Bishop of The Church of Jesus Christ of Latter-day Saints, a Utah corporation sole.	(company)
Signature:	Signature:
Print Name:	Print Name:
Title:	Title:
Address:	Address:
Telephone No:	Telephone No:
Facsimile No:	Facsimile No:
Email:	Email:
Effective Date:	Fed. I.D. or SSN:
	License No:
Reviewed By:	Date Signed:

SUPPLEMENTARY CONDITIONS

FOR 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. <u>Payment</u>

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

DIVISION 01

SECTION 01 0000

GENERAL REQUIREMENTS: R&I PROJECT

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

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 or structure.
   2. Salvage of existing items to be reused or recycled.

B. Related Requirements:
   1. Section 26 0501: 'Common Electrical Requirements' for salvage of existing electrical items to be reused or recycled removed by Owner.

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, in addition to requirements of Section 01 3100, meet on site to confirm work to be demolished, items to be salvaged or reused, and coordination with Owner.

C. Scheduling:
   1. Indicate detailed sequence of selective demolition and removal work, with starting and ending dates for each activity, on Schedule specified in Section 01 3200.

1.4 SUBMITTALS

A. Informational Submittals:
   1. Special Procedure Submittals:
      a. Inventory:
         1) After selective demolition is complete, submit list of items that have been removed and salvaged.

1.5 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.

1.6 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.
   4. Engage a professional engineer to survey condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective demolition operations.
   5. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.

3.2 PREPARATION

A. Temporary Facilities:
   1. Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
   2. Maintain fire-protection facilities in service during selective demolition operations.

B. Temporary Shoring:
   1. Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.
   2. Strengthen or add new supports when required during progress of selective demolition.

C. 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.
   b. If services/systems are required to be removed, relocated, or abandoned, before proceeding with selective demolition, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.

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. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
      g. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
      h. Dispose of demolished items and materials promptly.

B. Selective Demolition Procedures For Specific Materials:
   1. Concrete: Demolish in sections. Cut concrete full depth at junctures with construction to remain and at regular intervals, using power-driven saw, then remove concrete between saw cuts.
   2. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, then remove masonry between saw cuts.

C. Removed and Salvaged Items:
   1. Relics, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, antiques, and other items of interest or value to Owner that may be encountered during selective demolition remain Owner's property. Carefully remove and salvage each item or object in a manner to prevent damage and deliver promptly to Owner.
      a. Clean salvaged items as directed by Owner.
      b. Pack or crate items after cleaning. Identify contents of containers.
      c. Store items in a secure area until delivery to Owner.
      d. Transport items to Owner's storage area designated by Owner.
      e. Protect items from damage during transport and storage.

D. Removed and Reinstalled Items:
   1. Clean and repair items to functional condition adequate for intended reuse. Paint equipment to match new equipment.
   2. Pack or crate items after cleaning and repairing. Identify contents of containers.
   3. Protect items from damage during transport and storage.
   4. 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.

E. 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 03 2100

REINFORCEMENT BARS

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Furnish and install concrete reinforcement bars as described in Contract Documents.

B. Related Requirements:
   1. Section 01 0000: 'General Requirements':
      a. Section 01 1200: 'Multiple Contract Summary' for Owner Furnished Testing and Inspecting Services.
   2. Section 04 2223: Architectural Concrete Unit Masonry

1.2 REFERENCES

A. Association Publications:
   1. American Concrete Institute:
      a. ACI 'Detailing Manual' (2004 Edition).
   2. Concrete Reinforcing Steel Institute (CRSI):
      a. CRSI, 'Manual of Standard Practice' (2009 28th Edition).

B. Reference Standards:
   1. American Concrete Institute:
      a. ACI 117-10: 'Specifications for Tolerances for Concrete Construction and Materials and Commentary' (Reapproved 2015).
      b. ACI 318-14, 'Building Code Requirements for Structural Concrete and Commentary'.
   2. ASTM International (Following are specifically referenced for reinforcement bars testing):
      a. ASTM A615/A615M-16, 'Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement'.

1.3 SUBMITTALS

A. Informational Submittals:
   1. Certificates:
      a. Mill certificates for mill tests for reinforcing in accordance with ASTM A615/A615M.

1.4 QUALITY ASSURANCE

A. Regulatory Agency Sustainability Approvals:
   1. Comply with provisions of following codes and standards except where more stringent requirements are shown or specified:
      a. American Concrete Institute:
         1) ACI 318, 'Building Code Requirements for Structural Concrete and Commentary'.
      b. Concrete Reinforcing Steel Institute:
         1) CRSI, 'Manual of Standard Practice'.

B. Qualifications:
   1. Throughout progress of the work of this section, provide at least one (1) person who shall be thoroughly familiar with Construction Documents and other applicable specified requirements,

completely trained and experienced in necessary skills, and who shall be present at site and shall direct all work performed under this Section:

a. In actual installation of the work of this Section, use adequate numbers of skilled workmen to ensure installation in strict accordance with approved design.
b. In acceptance or rejection of work performed under this Section, no allowance will be made for lack of skill on part of workmen.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Delivery And Acceptance Requirements:
1. Deliver bars separated by size and tagged with manufacturer's heat or test identification number.
2. Reinforcement bars shall be free of heavy rust scales and flakes, or other coating at time of delivery and placing.

B. Storage And Handling Requirements:
1. Properly protect rebar on site after delivery.

PART 2 - PRODUCTS

2.1 MATERIAL

A. Reinforcement Bars:
1. Bars shall have grade identification marks and conform to ASTM A615/A615M:
a. Grade 60 minimum, except dowels that are to be field bent, Grade 40 minimum.
2. Bars shall be deformed type.
3. Bars shall be free of heavy rust scales and flakes, or other bond-reducing coatings.

2.2 ACCESSORIES

A. Bar Supports:
1. Concrete masonry units or bricks are not acceptable.
2. For exposed-to-view concrete surfaces, where legs of supports are in contact with forms, provide supports with legs which are plastic protected (CRSI, Class 1) or stainless steel protected (CSRI, Class 2).
3. Type Two Acceptable Products:
a. Concrete 'dobies' or blocks wired to reinforcing.
b. Manufactured chairs with 4 sq inch (25.8 sq cm) bearing surface on sub-grade, or other feature to prevent chair from being pushed into sub-grade or damaging vapor retarder under slabs on grade.
c. Equals as approved by Architect before installation. See Section 01 6200.

2.3 FABRICATION

A. Fabricate reinforcement bars according to the Concrete Reinforcing Steel Institute (CRSI) 'Manual of Standard Practice' and details on Contract Documents.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General:

1. Clean reinforcement of loose rust and mill scale, earth, ice, and other materials which reduce or destroy bond with concrete.
2. Blowtorch shall not be used to facilitate field cutting or bending or any other reinforcing work.
3. Reinforcement shall not be bent after partially embedded in hardened concrete.

B. Placing Reinforcement:
1. Comply with Concrete Reinforcing Steel Institute CRSI 'Manual of Standard Practice' recommended practice for 'Placing Reinforcing Bars' for details and methods of reinforcement placement and supports. and as herein specified.
2. Bend bars cold.

C. Splices:
1. Non-Concrete Structural System:
   a. Avoid splices of reinforcement bars at points of maximum stress. Lap bars 60 bar diameters minimum unless dimensioned otherwise on Drawings. Run reinforcement bars continuous through cold joints.
   b. Run reinforcement bars continuous through cold joints.

D. Tolerances:
1. Provide following minimum concrete cover for reinforcement as per ACI 318 or ACI 318M. Arrange, space and securely tie bars and bar supports to hold reinforcement in position during concrete placement operations:

END OF SECTION

SECTION 04 0513

CEMENT AND LIME MASONRY MORTARING

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Quality of masonry mortar used on Project.

B. Related Requirements:
   1. Section 01 0000: 'General Requirements':
      a. Section 01 4000: 'Quality Requirements' for administrative and procedural requirements for quality assurance and quality control.
      b. Section 01 4301: 'Quality Assurance – Qualifications' establishes minimum qualification levels required.
   2. Sections Under 04 2000 Heading: Furnish and install mortar.

1.2 REFERENCES

A. Definitions:
   1. Mortar: Plastic mixture of cementitious materials, fine aggregate and water. See ASTM C270.

B. Reference Standards:
   1. ASTM International:
      a. ASTM C144-11, 'Standard Specification for Aggregate for Masonry Mortar'.
      b. ASTM C150/C150M-16, 'Standard Specification for Portland Cement'.
      c. ASTM C207-06(2011), 'Standard Specification for Hydrated Lime for Masonry Purposes'.
      d. ASTM C270-14a, 'Standard Specification for Mortar for Unit Masonry'.

1.3 SUBMITTALS

A. Informational Submittals:
   1. Source Quality Control Submittals:
      a. If pre-mixed wet mortar or pre-blended dry mortar mix are to be used, provide certification from Manufacturer or Supplier verifying that mixes meet specification requirements.
      b. If site mixed / blended mortar is to be used, provide written description of proposed method of measuring and mixing of materials.

PART 2 - PRODUCTS

2.1 SYSTEM

A. Performance:
   1. Minimum Compressive Strength at 28 Days:
      a. Type S: 1800 psi (12.4 MPa).

B. Materials:
   1. Portland Cement:
      a. Meet requirements of ASTM C150/C150M, Type II Low Alkali unless approved otherwise in writing by Architect.

2. Hydrated Lime:
   a. Meet requirements of ASTM C207, Type S.
3. Aggregate:
   a. Standard Mortar:
      1) Natural or manufactured sand meeting requirements of ASTM C144 and following:
         a) Fineness modulus: 1.6 to 2.5 percent.
         b) Water demand, ratio by weight: 0.65 percent maximum.
         c) Grading:

Sieve	Sieve	Percent Passing	
		Natural Sand	Manufactured Sand
No. 4	4.750 mm	100	100
No. 8	2 360 mm	95 to 100	95 to 100
No. 16	1.191 mm	70 to 100	70 to 100
No. 30	0.594 mm	40 to 75	40 to 75
No. 50	0.297 mm	10 to 35	20 to 40
No. 100	0.150 mm	2 to 15	10 to 25
No. 200	0.075 mm	none	0 to 10

4. Water:
   a. Clean and free of acids, alkalis, and organic materials.
5. Admixtures:
   a. Use no admixtures, except for color pigments specified below, without Architect's written permission. Use of any admixture to meet cold weather requirements and admixtures that increase air entrainment are expressly forbidden under all circumstances.

C. Mixes:
1. General:
   a. Heat water and sand to 140 deg F (60 deg C) maximum if temperature is below 40 deg F (4.4 deg C).
2. Unit Masonry Mortar: Type 'N':
   a. Parts by Volume:

Portland Cement	1
Hydrated Lime	1/2
Damp Loose Sand:	2-1/4 minimum to three maximum, times sum of volumes of cement and lime used. Maintain sand piles in damp, loose condition.

3. Unit Masonry Mortar: Type 'S':
   a. Parts by Weight:

Portland Cement	94 lbs	43 kg
Hydrated Lime	20 lbs	9 kg
Dry Sand	360 lbs min. to 480 lbs max.	163 kg min. to 218 kg max.

PART 3 - EXECUTION: Not Used

END OF SECTION

SECTION 04 0519

MASONRY ANCHORS AND INSERTS

PART 1 - GENERAL

1.1 SUMMARY

A. Products Furnished But Not Installed Under This Section:
   1. Cast-in anchors for masonry.
   2. Adhesive anchors and inserts for masonry.
   3. Drilled-in mechanical anchors for masonry.
   4. Screw anchors for masonry.
   5. Masonry anchors and inserts not specified elsewhere.

B. Related Requirements:
   1. Section 01 0000: 'General Requirements':
      a. Section 01 4000: 'Quality Requirements' for administrative and procedural requirements for quality assurance and quality control.
      b. Section 01 4301: 'Quality Assurance – Qualifications' for minimum qualification levels required.
   2. Section 03 3111: 'Cast-In-Place Structural Concrete' for installation of cast-in-place anchors and inserts.

1.2 REFERENCES

A. Reference Standards:
   1. American Concrete Institute:
      a. ACI 355.4-11, 'Qualification of Post-Installed Adhesive Anchors in Concrete and Commentary'.
      b. ACI 548.12-12, 'Specification for Bonding Hardened Concrete and Steel to Hardened Concrete with an Epoxy Adhesive'.
   2. ASTM International:
      a. ASTM A307-14, 'Standard Specification for Carbon Steel Bolts and Studs, 60000 psi Tensile Strength'.
      b. ASTM A563-15, 'Standard Specification for Carbon and Alloy Steel Nuts'.
      c. ASTM F1554-15, 'Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength'.
      d. ASTM F3125/F3125-15a, 'Standard Specification for High Strength Structural Bolts, Steel and Alloy Steel, Heat Treated, 120 ksi (830 MPa) and 150 ksi (1040 MPa) Minimum Tensile Strength, Inch and Metric Dimensions'.
   3. International Code Council (IBC) (2015 or latest edition available):
      a. Chapter 21, 'Masonry' for materials, design, construction and quality of masonry.
      b. ES Acceptance Criteria: 'Concrete Anchor Compendium':
         1) AC01, 'Acceptance Criteria For Expansion Anchors in Masonry Elements' (Approved Nov 2015).
         2) AC58, 'Acceptance Criteria For Adhesive Anchors in Concrete and Masonry Elements' (approved May 2012).
         3) AC106, 'Acceptance Criteria For Predrilled Fasteners (Screw Anchors) in Masonry' (Approved May 2012).
         4) AC193, 'Acceptance Criteria For Mechanical Anchors in Concrete Elements' (approved Oct 2015).
         5) AC308 'Acceptance Criteria For Post-Installed Adhesive Anchors In Concrete Elements' (approved Jan 2016).

c. ICC/ESR-1056, 'Titen HD Screw Anchors' (reissued 03/2016).
d. ICC/ESR-1385, 'KWIK Bolt 3 Masonry Anchor' (reissued 02/2016).
e. ICC/ESR-1396, 'Wedge-All Anchors' (reissued 03/2016).
f. ICC/ESR-1772, 'SET Adhesive Anchor Systems' (reissued 01/2016).
g. ICC/ESR-2682, 'Hilti HIT HY 70 Adhesive Anchoring Systems' (reissued 08/2016).

1.3 SUBMITTALS

A. Action Submittals:
1. Product Data:
a. Manufacturer's product literature for each item.

B. Informational Submittals:
1. Test And Evaluation Reports:
a. ICC ES Evaluation Report indicating conformance with current applicable ICC ES Acceptance Criteria.
2. Manufacturer's Instructions:
a. Manufacturer's published installation recommendations for each item.

1.4 QUALITY ASSURANCE

A. Qualifications:
1. Manufacturer:
a. Having sufficient capacity to produce and deliver required materials with out causing delay in work.
2. Installer:
a. Acceptable to Manufacturer, experienced in performing work of this section and has specialized in installation of work similar to that required for this project.

1.5 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 protected from exposure to harmful weather conditions and as directed by manufacturer.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Manufactured Units:
1. General:
a. Use hot-dipped galvanized or stainless steel with matching nuts and washers in exterior and moist interior applications unless indicated otherwise on Drawings.
b. Nut: Conform to requirements of ASTM A563, Grade A, Hex.
c. Conform to requirements of ASTM F3125/F3125 for chemical, physical and mechanical requirements for quenched and tempered bolts manufactured from steel and alloy steel.
2. Threaded rod for adhesive anchors and cast-in anchors: Conform to requirements of ASTM A307, Grade A or ASTM F1554.
3. Adhesive Anchors:
a. Cartridge Injection Adhesive Anchors.

b. Products shall have current ICC ES Evaluation report conforming to current ICC ES Acceptance Criteria ICC ES AC 58 for masonry.
c. Rod diameter and embedment length as indicated on Drawings.
d. Type Two Acceptable Products:
1) HIT-HY 70 by Hilti Fastening Systems, Tulsa, OK; www.us.hilti.com.
2) SET Epoxy by Simpson Strong-Tie Co., Pleasanton, CA www.simpsonanchors.com.
3) Equal as approved by Architect before installation. See Section 01 6200.

4. Drilled-In Mechanical Anchors (Expansion Bolts):
a. Products shall have current ICC ES Evaluation report conforming to current ICC ES Acceptance Criteria ICC ES AC 01 for masonry.
b. Type Two Acceptable Products:
1) Kwik Bolt 3 by Hilti Fastening Systems, Tulsa, OK www.us.hilti.com.
2) Wedge-All by Simpson Strong-Tie Co., Pleasanton, CA www.simpsonanchors.com.
3) Equal as approved by Architect before installation. See Section 01 6200.

5. Screw Anchors:
a. Provide anchors with length identification markings conforming to ICC ES AC 106 for masonry.
b. Type Two Acceptable Products:
1) Titen HD by Simpson Strong Tie Co, Dublin, CA www.strongtie.com.
2) Equals as approved by Architect through shop drawing submittal before installation. See Section 01 6200.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification of Conditions:
1. Embedded Items:
a. Identify position of reinforcing steel and other embedded items before drilling holes for anchors. Exercise care in coring or drilling to avoid damaging existing reinforcing or embedded items. Take precautions as necessary to avoid damaging pre-stressing tendons, electrical and telecommunications conduit, and gas lines.
b. Notify Engineer if reinforcing steel or other embedded items are encountered during drilling.
2. Base Material Strength: Unless otherwise specified, do not drill holes in masonry until mortar, or grout has achieved full design strength.

3.2 PREPARATION

A. Surface Preparation:
1. Clean surfaces prior to installation.
2. Prepare surface in accordance with Manufacturers written recommendations.

3.3 INSTALLATION

A. Drilled-In Anchors:
1. General:
a. Drill holes with rotary impact hammer drills using carbide-tipped bits or core drills using diamond core bits.
b. Unless otherwise shown on Drawings, drill holes perpendicular to masonry surface.
c. Where anchors are to be installed in cored holes, use core bits with matched tolerances specified by Manufacturer. Cores holes may only be used if acceptable to Manufacturer.
d. Perform anchor installation in accordance with Manufacturer's published instructions.
2. Adhesive Anchors:

a. Clean holes in accordance with Manufacturer's published instructions before installation of adhesive. Follow Manufacturer's recommendations to ensure proper mixing of adhesive components.
b. Inject adhesive into holes proceeding from bottom of hole and progressing toward surface so as to avoid introduction of air pockets into adhesive. Inject sufficient adhesive into hole to ensure that annular gap is filled to surface.
c. Remove excess adhesive from surface.
d. Shim anchors with suitable device to center anchor in hole. Do not disturb or load anchors before Manufacturer's specified cure time has elapsed.
e. Observe Manufacturer's recommendations with respect to installation temperatures for adhesive anchors. Base material temperatures must be maintained above minimum temperatures allowed by Manufacturer for full required epoxy cure time.

3. Drilled-in Mechanical Anchors (Expansion Bolts):
   a. Protect threads from damage during anchor installation.
   b. Set anchors to manufacturer's recommended torque, using torque wrench. Following attainment of ten (10) percent of specified torque, one hundred (100) percent of specified torque shall be reached within 7 or fewer complete turns of nut. If specified torque is not achieved within required number of turns, remove and replace anchor, unless otherwise directed by Architect.
4. Screw Anchors:
   a. Protect threads from damage during anchor installation.
   b. Set anchors to manufacturer's recommended torque, using torque wrench.

3.4 FIELD QUALITY CONTROL

A. Non-Conforming Work:
   1. Remove and replace misplaced or malfunctioning anchors.
   2. Fill empty anchor holes and patch failed anchor locations with high-strength, non-shrink, non-metallic grout acceptable to Architect.
   3. Anchors that fail to meet proof load or installation torque requirements will be regarded as malfunctioning.
   4. Repair damage to adjacent materials caused by product installation.

3.5 CLEANING

A. Waste Management:
   1. Disposal of rubbish, debris, and packaging materials.

3.6 PROTECTION

A. General:
   1. Protect installed products from damage during construction.

END OF SECTION

SECTION 04 2223

ARCHITECTURAL CONCRETE UNIT MASONRY: Structural Masonry

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
1. Furnish and install architectural concrete unit masonry as described in Contract Documents.
2. Furnish and install anchor bolts and embedded anchors as described in Contract Documents.
3. Grout door frames installed in CMU walls.

B. Products Installed But Not Furnished Under This Section:
1. Anchor bolts.
2. Door frames.
3. Elastomeric joint sealants.
4. Grout.
5. Metal lintels.
6. Mortar.
7. Reinforcement bars.
8. Windows.

C. Related Requirements:
1. Section 01 3100: ‘Project Management and Coordination’ for pre-installation conference.
2. Section 01 4000: ‘Quality Requirements’ for administrative and procedural requirements for quality assurance and quality control.
3. Section 01 4301: ‘Quality Assurance – Qualifications’ for minimum qualification levels required.
4. Section 03 2100: ‘Reinforcement Bars’.
5. Section 04 0513: 'Cement and Lime Masonry Mortaring' for quality of mortar.
6. Section 04 0516: 'Masonry Grouting' for quality of grout.
7. Section 04 0519: 'Masonry Anchors and Inserts' for anchor bolts used in masonry.
8. Section 07 9213: 'Elastomeric Joint Sealants'.
9. Section 08 1213: 'Hollow Metal Frames' for door frames.
10. Section 08 5619: ‘Pass Windows’ for windows.

1.2 REFERENCES

A. Association Publications:
1. American Concrete Institute:
   a. ACI 530/530.1-13, 'Building Code Requirements and Specification for Masonry Structures and Related Commentaries'.
2. The Brick Industry Association, Reston VA: 'Technical Notes on Brick Construction’ (July 2012), www.gobrick.com.
   a. Technical Notes on Brick Construction 1, ‘Cold and Hot weather Construction’ (June 2006).
   b. Technical Notes on Brick Construction 3, ‘Overview of Building Code Requirements for Masonry Structures (ACI 530-02/ASCE 5-02/TMS 402-02) and Specification for Masonry Structures (ACI 530.1-02/ASCE 6-02/TMS 602-02)’.
   c. Technical Notes on Brick Construction 20, ‘Cleaning Brickwork’ (June 2006).
   d. Technical Notes on Brick Construction 23, ‘Stains - Identification and Prevention’ (June 2006).
   e. Technical Notes on Brick Construction 23A, ‘Efflorescence - Causes and Prevention’ (June 2006).

B. Definitions:

1. Efflorescence: Deposit or encrustation of soluble salts, generally white and most commonly consisting of calcium sulfate that may form on surface of stone, brick, concrete, or mortar when moisture moves through and evaporates on masonry. Often caused by free alkalis leached from mortar, grout, adjacent concrete, or in clays.
2. Cold Weather, as referred to in this Section, is four (4) hours with ambient temperature below 40 deg F (4.4 deg C) in 24-hour period.
3. Grout: Mixture of cementitious material and aggregate to which sufficient water is added to produce placing consistency without segregation of constituents.
4. Hot Weather, as referred to in this Section, is ambient air temperature above 100 deg F (38 deg C) or ambient air temperature above 90 deg F (32 deg C) with wind velocity 8 mph (13 kph) or greater.
5. Mortar: Plastic mixture of cementitious materials, fine aggregate and water. See ASTM C270 or ASTM C476.

C. Reference Standards:
1. ASTM International:
   a. ASTM C90-16, 'Standard Specification for Loadbearing Concrete Masonry Units'.
   b. ASTM C150/C150M-16, ‘Standard Specification for Portland Cement’.
   c. ASTM C270-14a, ‘Standard Specification for Mortar for Unit Masonry’.
   d. ASTM C331/C331M-14, 'Standard Specification for Lightweight Aggregates for Concrete Masonry Units'.
   e. ASTM C476-16, ‘Standard Specification for Grout for Masonry’.
   f. ASTM C1019-16, ‘Standard Test Method for Sampling and Testing Grout’.
2. International Building Code (IBC) (2015 or latest approved edition):
   a. Chapter 17, ‘Special Inspections And Tests’.
      1) Section 1704, 'Special Inspections And Tests, Contractor Responsibility And Structural Observations'.
      2) Section 1705, ‘Required Special Inspection And Tests’.
         a) Section 1705.2, 'Steel Construction'.
   b. Chapter 21, 'Masonry' for materials, design, construction and quality of masonry.
3. Masonry Standards Joint Committee (MSJC) - The Masonry Society (TMS) / American Concrete Institute (ACI) / American Society of Civil Engineers (SEI/ASCE):
   a. TMS 402-13/ACI 530-13/ASCE 5-13, ‘Building Code Requirements and Specification for Masonry Structures and Commentary’.
   b. TMS 602-13/ACI 530.1-13/ASCE 6-13, ‘Specification for Masonry Structures and Commentary’.

1.3 SUBMITTALS

A. Informational Submittals:
1. Source Quality Control Submittals:
   a. Manufacturer's certification that units meet compressive strength specified requirements.

1.4 QUALITY ASSURANCE

A. Qualifications:
1. Installer: Requirements of Section 01 4301 applies, but not limited to following:
   a. Minimum of five (5) years experience on successfully completed projects of similar nature.

B. Testing And Inspection:
1. Testing and Inspection of Structural Masonry is not required.

1.5 DELIVERY, HANDLING, AND STORAGE

A. Delivery And Acceptance Requirements:

1. Check, carefully unload, and deliver material to site in such manner as to avoid soiling, damaging, or snipping.
2. Do not use damaged masonry units, damaged components of structure, or damaged packaged materials.

B. Storage And Handling Requirements:
   1. Aggregate:
      a. Store different aggregates separately.
      b. Store on high ground, or ideally, off ground to prevent contamination from dirt, organic materials and ground water, any of which may contribute to efflorescence and may be deleterious to mortar performance.
      c. Store under protective cover to avoid saturation and freezing in cold weather.
   2. Cementitious material:
      a. Do not use cementitious materials that have become contaminated.
      b. Protect from precipitation and groundwater.
         1) Store materials on elevated platforms, under cover, and in dry location.
         2) Do not use cementitious materials that have become damp.
   3. Masonry accessories:
      a. Store masonry accessories clear of ground, including metal items, to prevent corrosion and contamination by dirt and ground water which may contain soluble salts and other matter which may contribute to efflorescence and staining.
      b. Protect from damage until installation.
   4. Masonry units:
      a. Store material on planks clear of ground which may contain soluble salts and protect from damage, dirt, or disfigurement.
      b. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof membrane, securely tied. If units become wet, do not install until they are dry.
   5. Reinforcement:
      a. Protect reinforcement, ties, and metal accessories from permanent distortions, elements and store off ground.

1.6 FIELD CONDITIONS

A. Ambient Conditions:
   1. Cold Weather and Hot Weather Limitations:
      a. Follow requirements of TMS 402/ACI 530/ASCE 5-11 and TMS 602/ACI 530.1/ASCE 6.

PART 2 - PRODUCTS

2.1 SYSTEM

A. Design Criteria:
   1. Minimum Compressive Strength of (2000 psi 13.8 MPa).

B. Materials:
   1. Mortar: Type 'S' mortar as specified in Section 04 0513.
   2. Concrete Masonry Units:
      a. Design Criteria:
         1) Meet requirements of ASTM C90, lightweight classification:
            a) 85 lbs per cu ft (1 362 kg per cu meter) minimum weight classification.
            b) Lightweight aggregates conforming to ASTM C331/C331M.
            c) Do not use re-crushed masonry units as aggregate.
         2) Outside Corners: Square-edged, except where bull nose is indicated on Contract Drawings.
         3) Use special shapes for lintels, corners, jambs, sash, control joints, headers, bonding, etc, as required.

4) Uniform color and textures with unbroken edges. Smooth face, except where shown otherwise on Contract Drawings.

2.2 ACCESSORIES

A. Construction Cleaning Compounds:
1. Type Two Acceptable Products:
a. 202 or 202V by Diedrich Technologies, Oak Creek, WI www.diedrichtechnologies.com.
b. Surekleen No. 600 or Vana-Trol by ProSoCo Inc, Kansas City, KS www.prosoco.com.
c. Equal as approved by Architect before use. See Section 01 6200.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification Of Conditions:
1. Verify substrates have been properly prepared.
2. Verify built-in items are in proper location, and ready for roughing into masonry.
3. Notify Architect of any unsatisfactory preparation before proceeding.
a. Do not install masonry over unsuitable conditions.
b. Commencement of Work by installer is considered acceptance of substrate.

3.2 PREPARATION

A. Coordinate placement of reinforcement, anchors and accessories, flashings and weep holes and other moisture control products specified in other sections.

B. Provide temporary bracing during installation of masonry work. Maintain bracing in place until building structure provides permanent support.

3.3 INSTALLATION

A. General:
1. Place masonry, mortar and grout in accordance with TMS 602/ACI 530.1/ASCE 6.
2. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.
3. Masonry cutting:
a. Make cuts proper size to accommodate work of other trades.
b. Cut openings for electrical devices using cover plates no larger than can be covered by standard size plate.
c. Replace unit masonry in which larger than necessary openings are cut.
d. Do not patch openings with mortar or other material.
4. Step back unfinished work for joining with new work.
a. Use toothing only with Architect's approval.
5. Built-In Work:
a. As work progresses, install masonry flashings and weep holes and other built-in work specified in other sections.

B. Laying:
1. Layout:
a. Running bond except where indicated otherwise. Select masonry so there is uniform distribution of hues.
b. Use solid masonry where brick coursing would otherwise show cores.
2. Joints:

a. Tool concave: Fill completely except where indicated differently.
b. Do not tool until mortar has taken initial set.
c. Point holes in joints. Fill and tool properly.

3. Concrete Masonry Units:
a. Lay masonry units dry. Do not lay masonry on frozen material.
b. Align cells or cavities to preserve an unobstructed cavity for grouting.
c. Full bedding required on both webs and face shell under first course. Other courses need only face shell bedding except where bedding is needed to control flow of grout.
d. Do not allow excess mortar to block cells receiving grout.

C. Reinforcing:
1. Reinforcing shall be free of material that may destroy bond.
2. Steel Reinforcing Bars:
a. Place steel as shown on Contract Drawings.
b. Splice 48 bar diameters minimum.
c. Place reinforcing and dowels before pouring grout.
d. Dowel vertical reinforcing bars out of structure below with bars of same size and spacing.
e. Place horizontal bars in 8 inch (200 mm) deep bond beam units at top of wall and at 48 inches (1 200 mm) on center between. Continue bond beam units and reinforcement uninterrupted around corners and across wall intersections.
f. Place special vertical bars of same size as normal vertical reinforcement at corners and jambs of openings and recesses where bond beams are interrupted and at beam bearing locations not otherwise detailed.
g. Unless detailed otherwise, place special horizontal bars of same size as normal reinforcing above and below openings. Extend bars 24 inches (600 mm) minimum beyond opening.

D. Grouting:
1. Grout hollow metal door frames solid.
2. Provide grout-leveling bed for support of wall plates.

E. Special Techniques:
1. General:
a. Comply with cold-weather and hot weather requirements contained in TMS 402/ACI 530/ASCE 5-11 and TMS 602/ACI 530.1/ASCE 6.
b. Ideal mortar temperature is 70 deg F ± 10 deg F (21 deg C ± 6 deg C). Mixing temperature should be maintained within 10 deg F (6 deg C).
c. Cold weather:
1) Do not lay masonry in Cold Weather unless authorized by Architect.
2) Minimum temperature of units when laid: 20 deg F (minus 7 deg C).
3) The following options may be used in cold weather construction:
a) Change to higher type of mortar required in ASTM C270 (Example: If ASTM type N mortar is specified for normal temperature, change to type S or type M.).
b) Increase the protection time where required for twenty four (24) hour to forty eight (48) hour with no change being made in the type of mortar.
c) Without changing the mortar type and maintaining twenty four (24) hour protection, replace Type I portland cement in the mortar with type III, ASTM C150/C150M.
d) Do not use frozen materials or materials mixed or coated with ice or frost. Keep materials free of ice and snow. Do not lay masonry on frozen material. Remove and replace unit masonry damaged by frost or by freezing conditions.
e) Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F (4.4 deg C) and higher and will remain so until masonry has dried, but not less than seven (7) days after completing cleaning.
d. Hot weather:
1) During hot weather, shading masonry materials and equipment reduces mortar and grout temperatures. Scheduling construction to avoid hotter periods of day should be considered.
a) To improve flexural bond strength, sand piles should be kept cool and in damp, loose condition by sprinkling and by covering with plastic sheet to limit evaporation.
2. Cold Weather Requirements. Implement approved cold weather procedures and comply with following:

a. Preparation requirements. Comply with following requirements prior to conducting masonry work:
   1) Do not lay masonry units having either temperature below 20 deg F (minus 7 deg C) or containing frozen moisture, visible ice, or snow on their surface.
   2) Remove visible ice and snow from top surface of existing foundations and masonry to receive new construction. Heat these surfaces above freezing, using methods that do not result in damage.

b. Construction requirements. These requirements apply to work in progress and are based on ambient air temperature. Do not heat water or aggregates used in mortar or grout above 140 deg F (60 deg C). Comply with following requirements when following ambient air temperatures exist:
   1) Air temperature 40 deg F (4.4 deg C) to 32 deg F (0 deg C):
      a) Heat sand or mixing water to produce mortar temperatures between 40 deg F (4.4 deg C) and 120 deg F (49 deg C) at time of mixing. Grout does not require heated materials, unless temperature of materials is below 32 deg F (0 deg C):
   2) Air temperature below 32 deg F (0 deg C) to 25 deg F (minus 3.9 deg C):
      a) Heat sand and mixing water to produce mortar temperatures between 40 deg F (4.4 deg C) and 120 deg F (49 deg C) at time of mixing.
      b) Maintain mortar temperature above freezing until used in masonry. Heat grout aggregates and mixing water to produce grout temperature between 70 deg F (21.1 deg C) and 120 deg F (49 deg C) at time of mixing. Maintain grout temperature above 70 deg F (21.1 deg C) at time of grout placement. Heat masonry units to minimum temperature of 40 deg F (4.4 deg C) before installing thin-bed mortar.
   3) Air temperatures below 25 deg F (minus 3.9 deg C) to 20 deg F (minus 7 deg C). Comply with the following:
      a) Heat sand and mixing water to produce mortar temperatures between 40 deg F (4.4 deg C) and 120 deg F (49 deg C) at time of mixing.
      b) Maintain mortar temperature above freezing until used in masonry. Heat grout aggregates and mixing water to produce grout temperature between 70 deg F (21.1 deg C) and 120 deg F (49 deg C) at time of mixing. Maintain grout temperature above 70 deg F (21.1 deg C) at time of grout placement. Heat masonry units to minimum temperature of 40 deg F (4.4 deg C) before installing thin-bed mortar.
      c) Heat masonry surfaces under construction to 40 deg F (4.4 deg C) and use windbreaks or enclosures when wind is in excess of 15 mph (24 kph). Heat masonry to minimum of 40 deg F (4.4 deg C) prior to grouting.
   4) Air temperature below 20 deg F (minus 7 deg C). Comply with the following:
      a) Heat sand and mixing water to produce mortar temperatures between 40 deg F (4.4 deg C) and 120 deg F (49 deg C) at time of mixing.
      b) Maintain mortar temperature above freezing until used in masonry. Heat grout aggregates and mixing water to produce grout temperature between 70 deg F (21.1 deg C) and 120 deg F (49 deg C) at time of mixing. Maintain grout temperature above 70 deg F (21.1 deg C) at time of grout placement. Heat masonry units to minimum temperature of 40 deg F (4.4 deg C) before installing thin-bed mortar.
      c) Heat masonry surfaces under construction to 40 deg F (4.4 deg C) and use windbreaks or enclosures when wind is in excess of 15 mph (24 kph). Heat masonry to minimum of 40 deg F (4.4 deg C) prior to grouting.
      d) Provide enclosures and auxiliary heat to maintain air temperature above 32 deg F (0 deg C) within enclosure.

c. Protection: These requirements apply after masonry is place and are based on anticipated minimum daily temperature for grouted masonry and anticipated mean daily temperature for ungrouted masonry. Protect completed masonry in following manner:
   1) Maintain temperature of masonry units above 32 deg F (0 deg C) for first four (4) hours after thin-bed mortar application.
   2) Mean daily air temperature 40 deg F (4.4 deg C) to 25 deg F (minus 3.9 deg C):
      a) Protect masonry from rain or snow for twenty four (24) hour by covering with weather-resistive membrane.

3) Mean daily air temperature below 25 deg F (minus 3.9 deg C) to 20 deg F (minus 7 deg C):
   a) Completely cover masonry with insulating blankets or equal protection for twenty four (24) hours after completion of work. Extend time period to forty eight hours for grouted masonry, unless only cement in grout is Type III portland cement.
4) Mean daily air temperature below 20 deg F (minus 7 deg C) and below:
   a) Maintain newly constructed masonry temperature above 32 deg F (0 deg C) for at least twenty four (24) hours after being completed by using heated enclosures, electric heating blankets, infared lamps, or other acceptable methods. Extend time period to forty eight (48) hours for grouted masonry, unless only cement in grout is Type III portland cement.

3. Hot Weather Requirements. Implement approved hot weather procedures and comply with following:
   a. Preparation. Comply with following requirements prior to conducting masonry work:
      1) When ambient air temperature exceeds 100 deg F (37.8 deg C), or exceeds 90 deg F (32.2 deg C) with wind velocity greater than 8 mph (12.9 kph):
         a) Maintain sand piles in damp, loose condition.
         b) Provide necessary conditions and equipment to produce mortar having a temperature below 120 deg F (49 deg C).
      2) When ambient temperature exceeds 115 deg F (46.1 deg C), or exceeds 105 deg F (40.6 deg C) with wind velocity greater than 8 mph (12.9 kph), implement following requirements:
         a) Maintain sand piles in damp, loose condition.
         b) Provide necessary conditions and equipment to produce mortar having a temperature below 120 deg F (49 deg C).
         c) Shade materials and mixing equipment from direct sunlight.
   b. Construction. While masonry work is in progress:
      1) When ambient air temperature exceeds 100 deg F (37.8 deg C), or exceeds 90 deg F (32.2 deg C) with wind velocity greater than 8 mph (12.9 kph):
         a) Maintain temperature of mortar and grout below 120 deg F (49 deg C).
         b) Flush mixer, mortar transport container, and mortar boards with cool water before they come into contact with mortar ingredients or mortar.
         c) Maintain mortar consistency by retempering with cool water.
         d) Use mortar with two (2) hours of initial mixing.
         e) Spread thin-bed mortar no more than 4 feet (1.20 m) ahead of masonry units.
         f) Set masonry units within one (1) minute after spreading thin-bed mortar.
      2) When ambient temperature exceeds 115 deg F (46.1 deg C), or exceeds 105 deg F (40.6 deg C) with a wind velocity greater than 8 mph (12.9 kph), implement following requirements:
         a) Maintain temperature of mortar and grout below 120 deg F (49 deg C).
         b) Flush mixer, mortar transport container, and mortar boards with cool water before they come into contact with mortar ingredients or mortar.
         c) Maintain mortar consistency by retempering with cool water.
         d) Use mortar with two (2) hours of initial mixing.
         e) Spread thin-bed mortar no more than 4 feet (1.20 m) ahead of masonry units.
         f) Set masonry units within one (1) minute after spreading thin-bed mortar.
         g) Use cool mixing water for mortar and grout. Ice is permitted in mixing water prior to use. Do not permit ice in mixing water when added to other mortar or grout materials.
      3) Protection:
         a) When ambient air temperature exceeds 100 deg F (37.8 deg C), or exceeds 90 deg F (32.2 deg C) with wind velocity greater than 8 mph (12.9 kph):
            (1) Fog spray newly constructed masonry until damp, at least three (3) times a day until masonry is three (3) days old.

F. Tolerances:
   1. Masonry work shall be true to vertical and horizontal planes within 1/8 inch (3 mm) in 10 feet (3 meters), non-cumulative.
   2. Maintain 3/8 inch (9.5 mm) mortar joints throughout.

3.4 FIELD QUALITY CONTROL

A. Non-Conforming Work:
   1. Remove and replace defective material at Architect's direction and at no additional cost to Owner.

3.5 PROTECTION

A. General:
   1. During construction, all walls to protect from weather and to prevent accumulation of water in cores of CMU, should be kept dry by covering top of wall with a strong, water-resistant membrane at end of each day or shutdown period. Covering should overhang wall by at least 24 inches (610 mm) on each side, and should be secured against wind.
   2. Covering should remain in place until top of cavity wall is completed or protected by adjacent materials.
   3. Protect masonry with covering during rainy weather.

B. Freezing:
   1. In cold weather, all materials and walls should be properly protected against freezing including storing of materials, preparation of mortar, heating of masonry units, laying precautions, and protection of Work. Follow recommendations for cold weather of Masonry Standards Joint Committee (MSJC) - The Masonry Society (TMS) / American Concrete Institute (ACI) / American Society of Civil Engineers (SEI/ASCE) TMS 402/ACI 530/ASCE 5-11 and TMS 602/ACI 530.1/ASCE 6.
   2. Remove all masonry deemed frozen or damaged.

C. Brace masonry walls until walls attain adequate strength and are tied into building structure.

D. Do not allow structural loading of masonry walls until walls attain adequate strength.

3.6 CLEANING

A. General:
   1. Clean CMU as outlined in Brick Industry Association Technical Notes on Brick Construction 20, ‘Cleaning Brickwork'.
   2. After mortar has hardened, wet masonry and clean with specified cleaning compound. Use stiff fibered brush for application. Rinse masonry surfaces with water immediately after cleaning. Leave masonry clean, free of mortar daubs, and with tight mortar joints.
   3. Wash adjacent non-masonry surfaces. Use detergent and soft brushes or cloth.
   4. Sweep and rake adjacent pavement and grounds to remove mortar and debris. Where necessary, pressure wash pavement surfaces to remove mortar, dust, dirt, and stains.

B. Waste Management:
   1. Clean up masonry debris and remove from site.

END OF SECTION

SECTION 05 1200

STRUCTURAL STEEL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Furnish and install structural steel framing as part of building structure as described in Contract Documents.

B. Related Requirements:
   1. Section 01 0000: 'General Requirements':
      a. Section 01 4000: 'Quality Requirements' for administrative and procedural requirements for quality assurance and quality control.
      b. Section 01 4301: 'Quality Assurance – Qualifications' establishes minimum qualification levels required.
   2. Sections under 04 2000 heading: Installation of structural items to be embedded in masonry.

1.2 REFERENCES

A. Association Publications:
   1. American Institute of Steel Construction:
      a. AISC 'Guide to Design Criteria for Bolted and Riveted Joints' (2nd Edition).
      b. AISC 'Steel Construction Manual' (14th Edition).

B. Reference Standards:
   1. American Concrete Institute:
      a. ACI 318-14, 'Building Code Requirements for Structural Concrete' (ACI 318) and 'Commentary on Building Code Requirements for Structural Concrete' (ACI 318R).
      b. ACI 318M-14, 'Building Code Requirements for Structural Concrete (ACI 318M) and Commentary' (ACI 319RM).
   2. American Institute of Steel Construction / The Society for Protective Coatings:
      a. AISC 420-10/SSPC-QP 3, 'Certification Standard for Shop Application of Complex Protective Coating Systems'.
   3. American National Standards Institute / American Institute of Steel Construction:
      a. ANSI/AISC 340-14, 'Specification for Structural Joints using High-Strength Bolts'.
      b. ANSI/AISC 341-10, 'Seismic Provisions for Structural Steel Buildings'.
      c. ANSI/AISC 358-10, 'Prequalified Connections for Special and Intermediate Steel Moment Frames for Seismic Applications'.
      d. ANSI/AISC 360-10, 'Specification for Structural Steel Buildings'.
   4. American National Standards Institute / American Society for Nondestructive Testing (Following are specifically referenced for Structural Steel testing):
      a. ANSI/ASNT CP-189-2011, 'Standard for Qualification and Certification of Nondestructive Testing Personnel'.
      b. ANSI/ASNT SNT-TC-1A-2011, 'Personnel Qualification and Certification in Nondestructive Testing'.
   5. American National Standards Institute / American Welding Society (Following are specifically referenced for Structural Steel testing):
      a. ANSI/AWS D1.1/D1.1M:2015, 'Structural Welding Code - Steel'.
      b. ANSI/AWS D1.3/D1.3M:2008, 'Structural Welding Code - Sheet Steel'.
      c. ANSI/AWS D1.4/D1.4M:2011, 'Structural Welding Code - Reinforced Steel'.
   6. American Welding Society:
      a. AWS QC1:2007, 'Standard for AWS Certification of Welding Inspectors'.

7. ASTM International:
   a. ASTM A36/A36M-14, ‘Standard Specification for Carbon Structural Steel.'
   b. ASTM A53/A53M-12, ‘Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.'
   c. ASTM A435/A435M-90(2012), ‘Standard Specification for Straight-Beam Ultrasonic Examination of Steel Plates’.
   d. ASTM A500/A500M-13, ‘Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.'
   e. ASTM A992/A992M-11(2015), ‘Standard Specification for Structural Steel Shapes.'
   f. ASTM F3125/F3125M-15a, ‘Standard Specification for High Strength Structural Bolts, Steel and Alloy Steel, Heat Treated, 120 ksi (830 MPa) and 150 ksi (1040 MPa) Minimum Tensile Strength, Inch and Metric Dimensions’.
8. International Code Council (IBC) (2015):
   a. IBC Chapter 17, ‘Special Inspections And Tests’.
      1) Section 1704, 'Special Inspections And Tests, Contractor Responsibility And Structural Observations'.
      2) Section 1705, ‘Required Special Inspection And Tests’.
         a) Section 1705.2, 'Steel Construction'.

1.3 SUBMITTALS

A. Action Submittals:
   1. Product Data:
      a. Submit product data and samples, if requested by Architect.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Delivery And Acceptance Requirements:
   1. Deliver material to job site at such intervals as to insure uninterrupted progress of Work.
   2. Deliver anchor bolts, bearing plates and other items to be set by other Contractors shall be delivered to site in ample time for installation and with templates and/or setting instructions.

B. Storage And Handling Requirements:
   1. Structural steel shall not be handled until paint has thoroughly dried. Care must be exercised to avoid abrasions and other damage.
   2. Material shall be stocked out of mud and dirt and proper drainage shall be provided. Structural steel must be protected from damage or soiling by adjacent construction operations.

PART 2 - PRODUCTS

2.1 COMPONENTS

A. Materials:
   1. Angles, Channels, and Miscellaneous steel parts of steel framing systems.
      a. Meet requirements of ASTM A36/A36M.
      b. S, HP, C, or TEE shapes in horizontal or vertical application, together with angles, plates, etc, as shown on Drawings.

B. Fabrication:
   1. Requirements: Structural metal shall be product of domestic mill.
   2. ANSI/AISC 360 shall serve as minimum standard.
   3. Fabricate items to be embedded in concrete or masonry according to approved details of work to be connected.

C. Finishes: Shop prime structural steel.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification Of Conditions:
   1. Do not begin structural steel framing erection until structural support components have been installed and are in suitable condition to receive framing.

3.2 ERECTION

A. Special Techniques:
   1. Standards:
      a. AISC's 'Specification for Structural Steel Buildings' and 'Code of Standard Practice for Steel Buildings and Bridges' shall serve as minimum standards. Erection includes setting, aligning, and bracing as necessary.
   2. Do not overload or exceed carrying capacity of any structural steel element during construction period.
   3. Bridging installation shall proceed concurrently with truss erection and be completed before trusses are subjected to construction loads.
      a. Do not remove bridging after construction is complete.
   4. Plates or Channels Embedded in Concrete:
      a. Tack weld bolts to plates or channels to prevent bolts from turning when nuts are tightened.
   5. Immediately after erection, clean completed field connections and damaged surfaces with solvents and hand or power tools. After cleaning, apply corrosion-resistant primer compatible with factory-applied primer.

B. Interface With Other Work:
   1. Furnish items to be embedded in concrete or masonry to Division 03 or 04 respectively in time to be securely tied in place before placing concrete and grout.

3.3 FIELD QUALITY CONTROL

A. Field Tests And Inspections:
   1. General Requirements:
      a. Furnish items to be embedded in concrete or masonry to Division 03 or 04 respectively in time to be securely tied in place before placing concrete and grout.
   2. Structural Steel - General:
      a. Inspection during fabrication is not required if fabricator is registered and approved to perform such work without inspection. Field testing and field inspection of steel is not required.

END OF SECTION

SECTION 06 1011

WOOD FASTENINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Quality of wood fastening methods and materials used for Rough Carpentry unless specified otherwise.

B. Related Requirements:
   1. Section 03 1511: 'Concrete Anchors and Inserts' for Quality of Anchors and Inserts.
   2. Section 05 0523: 'Metal Fastenings' for Quality of bolts used for Rough Carpentry.
   3. Furnishing and installing of other fasteners are specified in individual Sections where installed.

1.2 REFERENCES

A. Reference Standards;
   1. APA-The Engineered Wood Association:
      a. APA AFG-01: Adhesives for Field-Gluing Plywood to Wood Framing (September 1974).
   2. ASTM International:
      a. ASTM A153/A153M-09, 'Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware'.
      b. ASTM D3498-03(2011), 'Standard Specification for Adhesives for Field-Gluing Plywood to Lumber Framing for Floor Systems'.
      c. ASTM F1667-15, 'Standard Specification for Driven Fasteners: Nails, Spikes, and Staples'.

1.3 SUBMITTALS

A. Action Submittals:
   1. Product Data:
      a. Manufacturer's literature on framing anchors and powder actuated fasteners.
   2. Shop Drawings:
      a. Submit diameter and lengths of fasteners proposed for use on Project. If length or diameter of proposed fasteners differ from specified fasteners, also include technical and engineering data for proposed fasteners including, but not limited to:
         1) Adjusted fastener spacing where using proposed fasteners and,
         2) Adjusted number of fasteners necessary to provide connection capacity equivalent to specified fasteners.
      b. Submit on powder-actuated fasteners other than those specified in Contract Documents showing design criteria equivalents at each application.
      c. Show type, quantity, and installation location of framing anchors. Where necessary, reference Drawing details, etc, for installation locations.

PART 2 - PRODUCTS

2.1 MANUFACTURED UNITS

A. Description:
   1. Nail Terminology:

a. When following nail terms are used in relation to this Project, following lengths and diameters will be understood. Refer to nails of other dimensions by actual length and diameter, not by one of listed terms:

Nail Term	Length	Diameter	Length	Diameter
8d Box	2-1/2 inches	0.113 inch	63.5 mm	2.827 mm
8d Common	2-1/2 inches	0.131 inch	63.5 mm	3.389 mm
10d Box	3 inches	0.128 inch	76.2 mm	3.251 mm
10d Common	3 inches	0.148 inch	76.2 mm	3.759 mm
16d Box	3-1/2 inches	0.135 inch	88.9 mm	3.411 mm
16d Sinker	3-1/4 inches	0.148 inch	82.6 mm	3.759 mm
16d Common	3-1/2 inches	0.162 inch	88.9 mm	4.115 mm

B. Materials:
1. Fasteners:
a. General:
1) Fasteners for preservative treated and fire-retardant-treated wood shall be of hot dipped zinc-coated galvanized steel, stainless steel, silicon bronzed, or copper. Coating weights for zinc-coated fasteners shall be in accordance with ASTM A153/A153M.
b. Nails:
1) Meet requirements of ASTM F1667.
2) Unless noted otherwise, nails listed on Drawings or in Specifications shall be common nail diameter, except 16d nails, which shall be box diameter.
c. Wood Screws:
1) SDS Screws:
a) Category Four Approved Products. See Section 01 6200 for definitions of categories.
(1) SDS Screws by Simpson Strong Tie Co, Dublin, CA www.strongtie.com.
2) All Other: Standard type and make for job requirements.
d. Powder-Actuated Fasteners:
1) Type One Quality Standard: Hilti X-DNI 62P8.
2) Manufacturers:
a) Hilti, Tulsa, OK www.us.hilti.com.
b) Redhead Division of ITW, Wood Dale, IL www.itw-redhead.com and Markham, ON www.itwconstruction.ca.
c) Equals as approved by Architect through shop drawing submittal before installation. See Section 01 6200.
2. Adhesives:
a. Construction Mastics:
1) Meet requirements of 'APA-The Engineered Wood Association' Specification AFG-01 or ASTM D3498.
2) Use phenol-resorcinol type for use on pressure treated wood products.
3. Framing Anchors:
a. Framing anchors and associated fasteners in contact with preservative hot dipped zinc-coated galvanized steel or stainless steel. Do not use stainless steel items with galvanized items.
b. Type Two Acceptable Products:
1) KC Metals Inc, San Jose, CA www.kcmetals.com.
2) Simpson Strong Tie Co, Dublin, CA www.strongtie.com.
3) United Steel Products Co Inc (USP), Montgomery, MN www.uspconnectors.com.
4) Equals as approved by Architect through shop drawing submittal before installation. See Section 01 6200.

PART 3 - EXECUTION

3.1 ERECTION

A. Secure one Manufacturer approved fastener in each hole of framing anchor that bears on framing member unless approved otherwise in writing by Architect.

B. Provide washers with bolt heads and with nuts bearing on wood.

END OF SECTION

SECTION 06 1100

WOOD FRAMING

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Furnish and install wood framing and blocking as described in Contract Documents.

B. Related Requirements:
   1. Sections under 06 4000 Heading: 'Architectural Woodwork' for wall blocking requirements.

1.2 REFERENCES

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

1.3 SUBMITTALS

A. Informational Submittals:
   1. Test And Evaluation Reports:
      a. Technical and engineering data on nails to be set by nailing guns for Architect's approval of types proposed to be used as equivalents to specified hand set nails and adjusted number and spacing of pneumatically-driven nails to provide equivalent connection capacity.

1.4 DELIVERY, STORAGE, AND HANDLING

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

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

PART 2 - PRODUCTS

2.1 MATERIALS

A. Dimension Lumber:
   1. Design Criteria:
      a. Meet requirements of PS 20 and National Grading Rules for softwood dimension lumber.
      b. Bear grade stamp of WWPA, SPIB, or other association recognized by American Lumber Standards Committee identifying species of lumber by grade mark or by Certificate of Inspection.

c. Lumber 2 inches (50 mm) or less in nominal thickness shall not exceed 19 percent in moisture content at time of fabrication and installation and be stamped 'S-DRY', 'K-D', or 'MC15'.
d. Preservative Treated Plates / Sills:
1) 2x4 (38 mm by 64 mm): Standard and better Douglas Fir, Southern Pine, or HemFir, or StrandGuard by iLevel by Weyerhaeuser Boise, ID www.ilevel.com. (LSL 1.3 E)
2) 2x6 (38 mm by 140 mm) And Wider: No. 2 or or MSR 1650f - 1.5e Douglas Fir, Southern Pine, HemFir, or StrandGuard by iLevel by Weyerhaeuser, Boise, ID www.ilevel.com. (LSL 1.3 E).

B. Posts, Beams, And Timbers 5 Inches by 5 Inches (125 mm by 125 mm) And Larger:
1. Design Criteria:
a. No. 1 or better Douglas Fir or Southern Pine.

C. Lumber Ledgers:
1. Design Criteria:
a. No. 2 Douglas Fir-Larch, or Southern Pine.

D. See drawings for additional requirements.

2.2 ACCESSORIES

A. Blocking:
1. Sound lumber without splits, warps, wane, loose knots, or knots larger than 1/2 inch (13 mm).

B. Furring Strips:
1. Utility or better.

C. Sill Sealer:
1. Closed-cell polyethylene foam, 1/4 inch (6 mm) thick by width of plate.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General:
1. Use preservative treated wood for wood members in contact with concrete or masonry, including wall, sill, and ledger plates, door and window subframes and bucks, etc.
2. Fire-Retardant Wood Treatment:
a. Field Cuts:
1) Do not rip or mill fire retardant treated lumber. Cross cuts, joining cuts, and drilling holes are permitted.

B. Interface With Other Work:
1. Coordinate with other Sections for location of blocking required for installation of equipment and building specialties. Do not allow installation of gypsum board until required blocking is in place.
2. Where manufactured items are to be installed in framing, provide rough openings of dimensions within tolerances required by manufacturers of such items. Confirm dimensions where not shown on Contract Drawings.

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

D. Walls:
1. Openings: Single, bearing stud supporting header and one adjacent (king) stud continuous between top and bottom plates, unless shown otherwise.
2. Corners And Partition Intersections: Triple studs.
3. Top Plates In Bearing Partitions: Doubled or tripled and lapped. Stagger joints at least 48 inches (1 200 mm).
4. Ends Of Stud Wall To Masonry. Use one of the following methods:
   a. Connect with 1/2 inch (13 mm) machine bolts 6 inches (150 mm) from top, 6 inches (150 mm) from bottom, and 48 inches (1 200 mm) maximum on center. Use three bolts minimum in height of 6 foot (1 800 mm) or higher wall.
   b. Secure wood to masonry using continuous 1/4 inch (6 mm) minimum bead of construction adhesive and powder actuated fasteners installed at 32 inches (800 mm) on center minimum.
5. Sill Plates:
   a. Shear Walls And Bearing Walls:
      1) Provide specified anchor 12 inches (300 mm) maximum and 4 inches (100 mm) minimum from each end of each plate.
      2) Shear Walls: Fasten with anchor bolts embedded in concrete or with screw anchors.
      3) Bearing Walls: Fasten with anchor bolts embedded in concrete, or with screw anchors or expansion bolts in drilled holes.
   b. Non-Structural Walls: Fasten with powder actuated fasteners.
   c. In addition to requirements of paragraphs 'a' and 'b' above, set sill plates of interior walls measuring less than 36 inches (900 mm) in length in solid bed of specified construction adhesive, except where sill sealer is used.
   d. Install specified seal sealer under sill plates of exterior walls of main building and of acoustically insulated interior walls.
6. Nailing:
   a. Stud to plate:

2 by 4 inch nominal	38 by 89 mm	End nail, two 16d OR toe nail, four 8d

   b. Top plates: Spiked together, 16d, 16 inches (400 mm) on center.
   c. Top plates: Laps, lap members 48 inches (1200 mm) minimum and nail with 16d nails 4 inches (100 mm) on center
   d. Top plates: Intersections, three 16d.
   e. Backing And Blocking: Three 8d, each end.
   f. Corner studs and angles: 16d, 16 inches (400 mm) on center.

E. Roof And Ceiling Framing:
1. Place with crown side up at 16 inches (400 mm) on center unless noted otherwise.
2. Install structural blocking and bridging as necessary and as described in Contract Documents.
3. Special Requirements:
   a. Roof And Ceiling Joists: Lap joists 4 inches (100 mm) minimum and secure with code approved framing anchors.
   b. Roof Rafters And Outlookers:
      1) Cut level at wall plate and provide at least 2-1/2 inches (64 mm) bearing where applicable. Spike securely to plate with three 10d nails.
      2) Attach to trusses or other end supports with framing anchors described in Contract Documents.
      3) Provide for bracing at bearing partitions.

F. Accessory / Equipment Mounting And Gypsum Board Back Blocking (nailers):
1. Furnish and install blocking in wood framing required for hardware, specialties, equipment, accessories, and mechanical and electrical items, etc.

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

a. Back up furring strips on exterior walls or walls in contact with earth with 15 lb (6.8 kg) felt strip.
b. Nail at 12 inches (300 mm) on center maximum.

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:

B. Products Installed But Not Furnished Under This Section:
   1. Architectural Woodwork.
   2. Fixed Shelving not part of casework.
   3. Miscellaneous Wood Trim.
   4. Pass-through Window and Trim.
   5. Plastic Laminate Countertops.
   6. Selected Building Specialties.
   7. Wood Trim at ceilings.
   8. Wood-Veneer-Faced Architectural Cabinets.
   9. Miscellaneous as specified elsewhere.

C. Related Requirements:
   1. Section 06 1100: 'Wood Framing' for furring and blocking.
   2. Section 06 2210: 'Miscellaneous Wood Trim'.
      a. Wood Trim.
   3. Sections under 06 4000 Heading: Furnishing of Architectural Woodwork.
      a. Section 06 4001: 'Common Architectural Woodwork Requirements':
         1) Approved Fabricators.
         2) Quality of wood materials to be used in Finish Carpentry.
      b. Section 06 4005: 'Plastic Laminate' for countertops.
      c. Section 06 4114: 'Wood-Veneer-Faced Architectural Cabinets'.
         1) Custom Casework:
   4. Section 07 9213: 'Elastomeric Joint Sealants' for quality of sealants, submittal and installation requirements.
   5. Section 08 5619: 'Pass Windows' for pass-through window used in CES Module.
   6. Sections under 09 9000 heading: Back priming of work to be installed against concrete or masonry or subjected to moisture, and finishing of finish carpentry and architectural woodwork.

1.2 REFERENCES

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

B. Definitions:
   1. 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

A. Manufacturers:
1. Manufacturer Contact List:
   a. Blum Inc, Stanley, NC www.blum.com.
   b. Bommer Industries, Landrum, SC www.bommer.com.
   c. CompX National, Mauldin, SC www.nclnet.com.
   d. Dow Chemical, Midland, MI www.dow.com.
   e. Flynn & Enslow, San Francisco, CA www.flynnenslow.com.
   f. Grass America Inc, Kernersville, NC www.grassusa.com.
   g. Hafele America Co., Archdale, NC hafele.com.
   h. Hillside Wire Cloth Co., Inc., Bloomfield, NJ www.hillsidewirecloth.com.
   i. Ives, Indianapolis, IN www.iveshardware.com.
   j. Knape & Vogt, Grand Rapids, MI www.knapeandvogt.com or Knape & Vogt Canada, Mississaugua, ON (905) 676-8972.
   k. Olympus Lock Co, Seattle, WA www.olympus-lock.com.
   l. Owens Corning, Toledo, OH www.owens-corning.com.
   m. Salice America Inc, Charlotte, NC www.saliceamerica.com.
   n. SOSS Door Hardware (Division of Universal Industrial Products Company) Pioneer OH www.soss.com.
   o. Stanley, New Britain, CT www.stanleyhardware.com or Oakville, ON (800) 441-1759.
   p. TWP Inc., Berkley, CA www.twpinc.com.
   q. Wire Cloth Manufacturers Inc., Mine Hill, NJ www.wireclothman.com.

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 PREPARATION

A. Surface Preparation:
1. Install Architectural Woodwork after wall and ceiling painting is completed in areas where Architectural Woodwork is to be installed.

3.3 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. Allow for free movement of panels.
5. Countersink nails. Countersink screws and plug those exposed to view.
6. Attach custom casework as specified in Sections under 06 4000 Heading: 'Furnishing of Architectural Woodwork' to wall blocking with #10 x 3 inch (76 mm) minimum Cabinet Screws. Attach wall cabinets with screws equally spaced horizontally not to exceed 12 inches (305 mm) O.C. with 3 inch (76 mm) maximum spacing at cabinet edges.

END OF SECTION

SECTION 06 2024

DOOR, FRAME, AND FINISH HARDWARE INSTALLATION

PART 1 - GENERAL

1.1 SUMMARY

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

B. Products Installed But Not Furnished Under This Section:
   1. Finish hardware.

C. Related Requirements:
   1. Section 07 9213: ' Elastomeric Joint Sealants' for quality of sealants.

1.2 REFERENCES

A. Association Publications:
   1. Door and Hardware Institute (DHI) 14150 Newbrook Drive, Suite 200 Chantilly, VA www.dhi.org, *Installation Guide for Doors & Hardware' by Door & Hardware Institute*.

1.3 SUBMITTALS

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

1.4 DELIVERY, STORAGE, AND HANDLING

PART 2 - PRODUCTS: Not Used

PART 3 - EXECUTION

3.1 INSTALLATION

A. Hardware:
   1. General:
      a. Install using set of Manufacturer's installation, adjustment, and maintenance instructions submitted with hardware under Section 08 7101. Follow as closely as possible.
   2. Hardware for Wood Doors:
      a. If doors are not factory-machined, use hardware templates furnished by Hardware Manufacturer when mounting hardware.
      b. Set hinges flush with edge surface. Be sure that hinges are set in a straight line to prevent distortion.
      c. Mount door latches high in strike plate opening so when door later settles, latch will not bind.

3.2 FIELD QUALITY CONTROL

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

END OF SECTION

SECTION 06 2210

MISCELLANEOUS WOOD TRIM

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Furnish and install wood trim not specified elsewhere as described in Contract Documents.

B. Related Requirements:
   1. Section 06 1100: 'Wood Framing' for wall blocking required for Wood Trim.
   2. Section 06 2001: 'Common Finish Carpentry Requirements':
      a. Installation of Wood Trim.
      b. General standards for materials and fabrication of Architectural Woodwork.
   3. Section 06 4512: 'Architectural Woodwork Wood Trim'.

1.2 REFERENCES

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

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

1.3 SUBMITTALS

A. Action Submittals:
   1. Samples:
      a. Interior Hardwood for Transparent Finish:
         1) Before performing work of this Section, prepare Control Sample, to match sample available from Owner, to be used as finishing standard for interior clear finished hardwood as specified in Section 09 9324.
         2) Design Criteria:
            a) Provide 8 inch by 10 inch (200 mm by 255 mm) sample of Red Oak to match Owner provided stain color selected for Project.
            b) Control Sample will be used as performance standard for evaluating finish provided.

B. Informational Submittals:
   1. Source Quality Control Submittals:
      a. Samples:
         1) Interior Hardwood for Transparent Finish:
            a) Owner will provide Control Sample for finish.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Design Criteria:
   1. General:
      a. Meet requirements of Section 06 4001 for general standards for materials and fabrication of Architectural Woodwork.
   2. Clear Finished Hardwood:
   3. Opaque Finished Hardwood: Hardwood allowed by AWS Custom Grade.
   4. Opaque Finished Softwood: Solid stock Pine, C or better, S4S.
   5. Opaque Finished Paneling: Paneling allowed by AWS Custom Grade.

2.2 SOURCE QUALITY CONTROL

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

PART 3 - EXECUTION: Not Used

END OF SECTION

SECTION 06 2710

SHELVING

PART 1 - GENERAL

1.1 SUMMARY

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

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

1.2 REFERENCES

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

PART 2 - PRODUCTS

2.1 MATERIALS

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

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

2.2 ACCESSORIES

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

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

PART 3 - EXECUTION

3.1 INSTALLATION

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

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

END OF SECTION

SECTION 06 4001

COMMON ARCHITECTURAL WOODWORK REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

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

B. Related Requirements:
   1. Section 06 1100: 'Wood Framing' for furring and blocking.
   2. Section 06 2001: 'Common Finish Carpentry Requirements' for Installation.
   3. Section 06 2210: ‘Miscellaneous Wood Trim’.
   4. Section 06 4005: ‘Plastic Laminate’.
   5. Section 06 4114: ‘Wood-Veneer-Faced Architectural Cabinets’.
   6. Section 06 4512: ‘Architectural Woodwork Wood Trim’.

1.2 REFERENCES

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

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

1.3 SUBMITTALS

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

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

1.4 QUALITY ASSURANCE

A. Qualifications: Requirements of Section 01 4301 applies, but not limited to following:
   1. Fabricator:

a. Fabricator Firm specializing in performing work of this section.
   1) Firm experience in supplying products indicated for this Project.
   2) Firm with sufficient production capacity to produce required units.
   3) Firm will comply with specifications and Contract Documents for this Project.
   4) Minimum five (5) years experience in Woodwork installations.
   5) Minimum five (5) satisfactorily completed installations in past three (3) years of projects similar in size, scope, and installation procedures required for this project before bidding.
b. Upon request by Architect or Owner, submit documentation.

1.5 DELIVERY, HANDLING, AND STORAGE

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

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

PART 2 - PRODUCTS

2.1 FABRICATORS

A. Approved Fabricators. See Section 01 4301:
   1. Meet Quality Assurance Fabricator Qualifications as specified in Part 1 of this specification.

B. Approved Fabricators. See Section 01 4301:
   1. Meet Quality Assurance Fabricator Qualifications as specified in Part 1 of this specification.

2.2 ASSEMBLIES

A. Design Criteria:
   1. General:
      a. AWS Custom Grade is minimum acceptable standard, except where explicitly specified otherwise, for materials, construction, and installation of architectural woodwork.
   2. Materials:
      a. Lumber:
         1) Grade:
            a) No defects in boards smaller than 600 sq in (3 871 sq cm).
            b) One defect per additional 150 sq inches (968 sq cm) in larger boards.
            c) Select pieces for uniformity of grain and color on exposed faces and edges.
            d) No mineral grains accepted.
         2) Allowable Defects:
            a) Tight knots not exceeding 1/8 inch (3 mm) in diameter. No loose knots permitted.
            b) Patches (dutchmen) not apparent after finishing when viewed beyond 18 inches (450 mm).
            c) Checks or splits not exceeding 1/32 inch by 3 inches (1 mm by 75 mm) and not visible after finishing when viewed beyond 18 inches (450 mm).
            d) Stains, pitch pockets, streaks, worm holes, and other defects not mentioned are not permitted.
            e) Normal grain variations, such as cats eye, bird's eye, burl, curl, and cross grain are not considered defects.

3) Use maximum lengths possible, but not required to exceed 10 feet (3 meters) without joints. No joints shall occur closer than 72 inches (1 800 mm) in straight runs exceeding 18 feet (3 600 mm). Runs between 18 feet (3 600 mm) and 10 feet (3 meters) may have no more than one joint. No joints shall occur within 72 inches (1 800 mm) of outside corners nor within 18 inches (450 mm) of inside corners.
4) Moisture content shall be six (6) percent maximum at fabrication. No opening of joints due to shrinkage is acceptable.

B. Fabrication:
1. Follow Architectural Woodwork Standards (AWS) for fabrication of Architectural Woodwork.
2. Tolerances:
   a. No planer marks (KCPI) allowed. Sand wood members and surfaces with 100 grit or finer.
   b. Maximum Gap: None allowed.
   c. Flushness Variation: 0.015 inch (0.4 mm) maximum.
   d. Sanding Cross Scratches: 1/4 inch (6 mm) maximum.
   e. Plug screw holes. Screw locations not to be visible beyond 18 inches (450 mm).
3. Fabricate work in accordance with measurements taken on job site.
4. 'Ease' sharp corners and edges of exposed members to promote finishing and protect users from slivers. Radius of 'easing' shall be uniform throughout Project and between 1/32 and 1/16 of an inch (0.8 and 1.6 of a millimeter).
5. Fabricate so veneer grain is vertical.
6. Joints:
   a. Use lumber pieces with similar grain pattern when joining end to end.
   b. Compatibility of grain and color from lumber to panel products is required.
7. Install hardware in accordance with Manufacturer's directions. Leave operating hardware operating smoothly and quietly.
8. Remove or repair damaged surface of or defects in exposed finished surfaces of architectural woodwork to match adjacent similar undamaged surface.

PART 3 - EXECUTION: Not Used

END OF SECTION

SECTION 06 4005

PLASTIC LAMINATE

PART 1 - GENERAL

1.1 SUMMARY

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

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

1.2 REFERENCES

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

B. Definitions:
   1. Flame Spread: The propagation of flame over a surface.
   2. Flame Spread Index: The numerical value assigned to a material tested in accordance with ASTM E84 or UL 723 or ULC 102.
   3. Grade: Unless otherwise noted, this term means Grade rules for Economy, Custom, and/or Premium Grade.
      a. Premium Grade: Highest Grade available in both material and workmanship where highest level of quality, materials, workmanship, and installation is required.
   4. High-Pressure Decorative Laminate (HPDL): Laminated thermosetting decorative sheets intended for decorative purposes. Sheets consist essentially of layers of fibrous sheet material, such as paper, impregnated with thermosetting condensation resin and consolidation under heat and pressure. Top layers have decorative color or printed design. Exposed surface has attractive exposed surface that is durable and resistant to damage from abrasion and mild alkalies, acids, and solvents.
   5. Smoke-Developed Index: The numerical value assigned to a material tested in accordance with ASTM E84 or UL 723 or ULC 102.

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

a. UL 723: 'Standard for Safety Test for Surface Burning Characteristics of Building Materials'; (10th Edition).

1.3 SUBMITTALS

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

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

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

1.4 QUALITY ASSURANCE

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

PART 2 - PRODUCTS

2.1 MATERIALS

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

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

C. Plastic Laminates:
1. Design Criteria:

a. Countertops:
   1) Post-formed front edge and backsplash, except where detailed otherwise, with plastic laminate meeting requirements of ANSI/NEMA LD 3: PF 42.
      a) Vertical Applications: GP 28.
      b) Horizontal (other than countertops): GP 38.
   2) No raised lip on front edge.
b. Balancing Material: BK 20.
c. AWS Quality Grade: Premium.

2. Assemblies:
   a. Countertops shall meet requirements of KCMA A161.1.
   b. Adhesives for other than post-formed types shall be spray grade, high heat resistant, neoprene contact adhesive.
3. Category Four Approved Colors. See Section 01 6200 for definition of Categories:
   a. Formica: 300-58.
   b. Nevamar: ES2001, TQ2001, MR7001, MR7002.
   c. Pionite: AT951-5, LG110-S, AT161.
   d. WilsonArt: 2932-60, 4810-60, 4170-60.

PART 3 - EXECUTION: Not Used

END OF SECTION

SECTION 06 4114

WOOD-VENEER-FACED ARCHITECTURAL CABINETS

PART 1 - GENERAL

1.1 SUMMARY

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

B. Related Requirements:
   1. Section 06 1100: 'Wood Framing' for wall blocking required for Custom Casework.
   2. Section 06 2001: ‘Common Finish Carpentry Requirements’ for installation of Custom casework.
   3. Section 06 4001: ‘Common Architectural Woodwork Requirements’ for:
      a. Approved Fabricators.
      b. General standards for materials and fabrication of Architectural Woodwork and for hardware associated with Architectural Woodwork.
   4. Section 08 5619: ‘Pass Windows’ for pass through windows used in CES Module.

1.2 REFERENCES

A. Association Publications:
   1. Architectural Woodwork Institute / Architectural Woodwork Manufacturers Association of Canada / Woodwork Institute, 46179 Westlake Drive, Suite 120, Potomac Falls, VA www.awinet.org.
      a. Architectural Woodwork Standards (AWS), 2nd Edition, 2014.
      b. HPVA, NWWDA, or APA
   2. Hardwood Plywood & Veneer Association (HPVA), Reston, VA www.hpva@hpva.org.
   3. The Engineered Wood Association (APA), Tacoma, WA www.apawood.org.
   4. Window & Door Manufacturers Association (WDMA) Chicago, IL www.wdma@wdma.com:
      a. WDMA-INF03, ‘A Specifier’s Guide to Door Face Veneers’.

B. Definitions:
   1. Adhesive, Type I (fully waterproof): Forms a bond that will retain practically all of its strength when occasionally subjected to a thorough wetting and drying; bond shall be of such quality that specimens will withstand shear and the two-cycle boil test specified in ANSI/HPVA HP (latest edition).
   2. Adhesive, Type II (water-resistant): Forms a bond that will retain practically all of its strength when occasionally subjected to a thorough wetting and drying; bond shall be of such quality that specimens will withstand the three-cycle cold soak test specified in ANSI/HPVA HP (latest edition).
   3. Book-Match: Matching between adjacent veneer leaves on one panel face. Every other piece of veneer is turned over so that the adjacent leaves are “opened” as two pages in a book. The fibers of the wood, slanting in opposite directions in the adjacent leaves, create a characteristic light and dark effect when the surface is seen from an angle.
   4. Concealed Surfaces: Top and bottom edges of wood unless the top edge is visible from above.
   5. Core: The material (typically, veneer, lumber, particleboard, medium-density fiberboard, or a combination of these) on which an exposed surface material (typically, veneer or high-pressure decorative laminate HPDL) is applied.
   6. Core, Solid: The innermost layer or section in flush door construction. Typical constructions are as follows:
      a. Fiberboard Core: Manufactured from wood reduced to fine fibers mixed with binders and formed by the use of heat and pressure into panels.
      b. Particleboard - A solid core of wood or other lignocellulose particles bonded together with a suitable binder, cured under heat, and pressed into a rigid panel in a flat-platen press.

7. Edge Banding: Method of concealing plies or inner cores of plywood or particleboard when edges are exposed.
8. Exposed Surfaces: Surfaces normally visible after installation.
9. Face: The better side of any panel in which the outer plies are of different veneer grades; also either side of a panel in which there is no difference in veneer grade of the outer plies.
10. Face Veneer: The outermost exposed wood veneer surface of a veneered wood door, panel, or other component exposed to view when the project is completed.
11. Flitch: A hewn or sawn log made ready for veneer production or the actual veneer slices of one half log, kept in order, and used for the production of fine plywood panels.
12. Grade: Unless otherwise noted, this term means Grade rules for Economy, Custom, and/or Premium Grade:
    a. Custom Grade: Typically specified for and adequately covers most high-quality architectural woodwork, providing a well-defined degree of control over a project's quality of materials, workmanship, or installation.
13. Hardwood: General term used to designate lumber or veneer produced from temperate zone deciduous or tropical broad-leaved trees in contrast to softwood, which is produced from trees which are usually needle bearing or coniferous. Term does not infer hardness in its physical sense.
14. High-Pressure Decorative Laminate (HPDL): Laminated thermosetting decorative sheets intended for decorative purposes. Sheets consist essentially of layers of fibrous sheet material, such as paper, impregnated with thermosetting condensation resin and consolidation under heat and pressure. Top layers have decorative color or printed design. Exposed surface has attractive exposed surface that is durable and resistant to damage from abrasion and mild alkalies, acids, and solvents. Also known as Plastic Laminate.
15. Joint: Line of juncture between edges or ends of two adjacent pieces of veneer.
16. Medium Density Fiberboard (MDF): Generic name for a panel or core manufactured from lignocellulosic fibers combined with synthetic resin or other suitable binder and bonded together under heat and pressure in hot press by process in which added binder creates entire bond.
17. Melamine: Resin-impregnated paper used in decorative composite panel products.
18. Panel Product: Panels manufactured with differences in core materials, adhesives or binders which affect characteristics of the panels. These include wood veneers and many prefinished wood panels and decorative overlays with aesthetic and performance characteristics.
19. Plain-Sawn: A hardwood figure developed by sawing a log lengthwise at a tangent to the annual growth rings. It appears as U-shaped or straight markings in the board's face.
20. Plain Slicing: Most commonly used for hardwood plywood. The log is cut in half, and one half is placed onto a carriage and moved up and down past a fixed knife to produce the veneers. Veneer is sliced parallel to the pith of the log and approximately tangent to the growth rings to achieve flat-cut veneer. Each piece is generally placed in a stack and kept in order. One half log, sliced this way, is called a "flitch."
21. fashion with wires intersecting at every available crimp or pocket (Used in Hardware Cloth).
22. Running Match: Each panel face is assembled from as many veneer leaves as necessary. Any portion left over from one panel may be used to start the next.
23. Semi-Exposed Surfaces: Surfaces that is only visible under closer examination.
24. Solid Stock: Solid, sound lumber (as opposed to plywood), that may be more than one piece of the same species, securely glued for width or thickness.
25. Veneer: A thin sheet or layer of wood, usually rotary cut, sliced or sawn from a log or flitch. Thickness may vary from 1/100 inch (0.3 mm) to 1/4 inch (6.4 mm).

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

1.3 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

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

1.4 SUBMITTALS

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

B. Informational Submittals:
   1. Source Quality Control Submittals:
      a. Samples:
         1) Interior Hardwood for Transparent Finish:
            a) Owner will provide Control Sample for finish.
   2. Special Procedure Submittals:
      a. Copy of AWS manual with shop drawing submission.

1.5 ASSEMBLIES

A. Components:
   1. Design Criteria:
      a. General:
         1) Except as noted otherwise, fabricate the work of this section according to AWS ‘Custom Grade’.
            a) Cabinet door wood grain direction shall run vertically and all doors shall be set matched.
            b) Cabinet drawer front wood grain direction may run vertically or horizontally, with same direction maintained on all cabinet or elevation of cabinets.
         2) Casework Construction Type:
            a) Type B: Face-frame construction where front edge of cabinet body components are overlaid with frame.
         3) Door interface style:
            a) Type B Construction: Flush Overlay.
      b. Solid Stock:
         1) Exposed: Plain sawn Red Oak.
         2) Semi-exposed And Concealed: Species as acceptable for AWS ‘Custom Grade’.
      c. Panel Product:
         1) Glues (adhesives) used in manufacture and fabrication of panel products shall be Type I or II.
         2) Moisture content shall be same as specified for lumber.
         3) Cores:

a) Cabinet Doors: Medium density fiberboard (MDF) with minimum density of 48 lbs per cu ft (769 kg per cu meter).
b) All Other: Industrial grade particle board with minimum density of 45 lbs per cu ft (721 kg per cu meter).

4) Facings:
a) Hardwood veneer facings shall be plain sliced Red Oak AWS Grade A, or equal by HPVA, WDMA, or APA.
b) All other facings shall be Melamine or Kortron.

5) Edgings:
a) Wood Veneer Faced Shelves:
(1) 3/4 inch by 1/4 inch (19 mm by 6 mm) edge-band of wood species matching hardwood face veneer on front edge with hot-glued, 2 mm thick minimum, wood-grained PVC edge-banding on other three sides.
b) Cabinet Doors And Drawer Fronts Higher Than 8 Inches (200 mm):
(1) 3/4 inch by 1/8 to 1/4 inch (19 mm by 3 to 6 mm) edge-banding of wood species matching hardwood face veneer.
c) Shelves And Exposed Panel Product Edges (Do not use in CES Module cabinetry):
(1) Hot-glued, 3 mm thick, PVC edge-banding. Wood-grain, except color matching Melamine or Kortron surface at shelf edges.
d) Semi-Exposed Panel Product Edges:
(1) Hot-glued, 3 mm thick, wood grained PVC edge-banding.

d. Casework Doors:
1) Face Veneer:
a) Design Criteria:
(1) Plain sliced Red Oak meeting requirements of AWS Grade A, 1/50 inch (0.5 mm) thick minimum immediately before finishing.
(2) Face veneers shall be running book matched.
2) Doors under 1-3/8 inch (35 mm) thick: Panel Product.
3) Doors 1-3/8 inch (35 mm) or more thick:
a) Door Grade: AWS Custom hollow-core.
b) Stiles:
(1) 1-1/4 inches (32 mm) deep minimum before fitting.
(2) 1/4 inch (6 mm) minimum of stile face to be hardwood matching face veneer material.
c) Rails:
(1) 1-1/8 inches (28.5 mm).
(2) Mill option material.

B. Fabrication:
1. Cabinet Body:
a. Use AWS Flush Overlay construction on cabinet bodies.
b. If used, install Rail System adjustable shelf supports recessed.
2. Drawers:
a. Fabricate with separate, screw-attached drawer front.
b. Joints shall be dowel and pressure-glued, or lock shoulder, glued, and pin nailed.
c. Set bottoms into sides, backs, and subfront with 1/4 inch (6 mm) deep groove with 3/8 inch (9.5 mm) minimum standing shoulder.
d. Every drawer shall have specified drawer guides and pull installed. Install drawer guides with 'Euroscrews', and pulls with through-bolts passing through both front and sub-front.
3. Cabinet Doors:
a. Full height, panel product cabinet doors may be fabricated in two pieces and joined on back with metal backplate. Backplate shall match interior door surface color.
b. Hinges: Install hinges using plastic insertion dowels for hinges and 'Euroscrews' for baseplates.
c. Every cabinet door shall have specified pull installed.
4. Cabinet Component Thickness And Material:
a. Use hardwood veneer facing on panel product, except on following surfaces:
1) Where Kortron or Melamine shall be used.

2) Cabinet exposed interiors surfaces (not including cabinet doors) and shelving faces behind cabinet doors in all rooms.
3) Cabinet semi-exposed surfaces.
4) Cabinet concealed surfaces.
5) Cabinet exposed exteriors permanently concealed (not exposed to view).
6) Drawer sides, backs, bottoms, and subfronts.

b. Ends, Divisions, Bottoms, Tops: 3/4 inch (19 mm) thick panel product.
c. Rails: 3/4 inch (19 mm) thick panel product.
d. Shelves:
1) Panel product.
2) Thickness:
a) 30 Inch (750 mm) Span And Less: 3/4 inch (19 mm) thick.
b) Spans Over 30 Inches (750 mm) To 42 Inches (1 050 mm): One inch (25 mm) thick.
c) Spans Over 42 inches (1 050 mm): One inch (25 mm) thick and provide Hafele or equal center supports.
e. Backs: 1/4 inch (6 mm) thick panel product.
f. Doors: 3/4 inch (19 mm) thick panel product.
g. Drawer Sides, Backs, And Subfronts: 1/2 inch (12.7 mm) thick minimum panel product.
h. Drawer Bottoms: 1/4 inch (6 mm) thick panel product.
i. Separate Drawer Front:
1) 8 Inches (200 mm) High And Less: 3/4 inch (19 mm) thick solid hardwood.
2) More Than 8 Inches (200 mm) High: 3/4 inch (19 mm) panel product.
j. Hardboard Dividers: 1/4 inch (6 mm) thick panel product.
k. Hardboard Shelves: 1/8 inch (3 mm) thick hardboard, smooth both sides.

5. Cabinet and Drawer Locks:
a. Install only on cabinets and drawers as shown on Contract Documents.
6. Install plastic grommets in cable access holes in countertops located as located on Contract Documents.

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

1.6 ASSESSORIES

A. Manufacturers:
1. Manufacturer Contact List for Assessories:
a. Accuride, Santa Fe Springs, CA www.accuride.com.
b. Anybumper, Amite, LA www.Anybumper.com.
c. Blum Inc, Stanley, NC www.blum.com.
d. CompX National, Mauldin, SC www.nclnet.com.
e. Glynn Johnson, Chicago, IL www.glynn-johnson.com.
f. Grass America Inc, Kernerville, NC www.grassusa.com.
g. Hafele America Co., Archdale, NC hafele.com.
h. Hager Companies, St Louis, MO www.hagerhinge.com or Hager Hinge (Canada) Ltd, Kitchener, ON (519) 893-7580.
i. Ives, Indianapolis, IN www.iveshardware.com.
j. Knape & Vogt, Grand Rapids, MI www.knapeandvogt.com or Knape & Vogt Canada, Mississaugua, ON (905) 676-8972.
k. Mark Eaton LLC, American Fork, UT www.markeatonllc.com.
1) Contact Information: Mark Eaton (801) 756-5639.
l. Mckinney, Scranton, PA www.mckinneyhinge.com or Markham, ON (905) 940-2040.
m. Olympus Lock Co, Seattle, WA www.olympus-lock.com.

n. Salice America Inc, Charlotte, NC www.saliceamerica.com.
o. Stanley, New Britain, CT www.stanleyhardware.com.
p. Techna-Base Inc, Pleasant Grove, UT (801) 361-2289 or dlundahl@earthlink.net.
1) Contact Information: Dewey Lundahl (801) 785-6477 or (801) 361-2289 (cell).
q. Trimco, Los Angeles, CA www.trimcobbw.com.

B. Cabinet Hardware:
1. Cabinet And Drawer Pulls:
a. Satin Chromium Plated brass / bronze core bow handles, 4 inches (100 mm) long minimum.
b. Type Two Acceptable Products:
1) 4484 by Stanley.
2) Equal as approved by Architect before installation. See Section 01 6200.
2. Cabinet And Drawer Locks:
a. General:
1) Pin tumbler type suitable for location.
2) Keying: Key each cabinet and drawer individually as shown on Contract Documents except as follows:
a) Key each cabinet and drawer within each Office alike.
3) Stamp keys with Room number and cabinet designation as shown on Signage Plan of Contract Drawings.
4) Provide six (6) keys per cabinet.
b. Design Criteria:
1) Barrel diameter: 7/8 inch (22 mm).
2) Cylinder length: 7/8 inch (22 mm).
3) Key removable in locked or unlocked position.
4) Meet ANSI/BHMA A156.11 Grade 2 requirements.
c. Type Two Acceptable Manufacturers:
1) Advantage Plus cam lock by CompX National Lock.
2) 100DR/200DW N Series door and drawer lock by Olympus Lock Inc.
3) Equal as approved by Architect before installation. See Section 01 6200.
3. Cabinet Adjustable Shelf Supports:
a. Either of following systems are acceptable, at Fabricator's option:
1) 32mm System: Casework Fabricator's standard.
2) Traditional System:
a) Class Two Quality Standards: 255 and 256 by Knape & Vogt.
4. Cabinet Hinges:
a. Description:
1) Cup Hinge (Concealed Hinge or European style).
2) Steel, nickel-plated, full overlay, self closing with dowel, Mod 17.
b. Design Criteria:
1) Doors 48 inches (1 200 mm) High or Less:
a) Two (2) hinges.
b) Hinge Opening: 165 degree minimum.
2) Doors over 48 inches (1 200 mm) High:
a) Four (4) hinges.
b) Hinge Opening: 165 degree minimum.
c. Basis of Design: Model 329.03.558 with Model 329.73.510 mounting plate by Hafele.
1) Category Four Approved Manufacturers. See Section 01 6200 for definitions of Categories:
a) Blum.
b) Grass America.
c) Hafele.
d) Knape & Vogt.
e) Salice.
5. Cabinet Inactive Leaf Catches:
a. Class Two Quality Standards:
1) Full-Height Doors: Two Surface Bolts No 043 - 2 inch (50 mm) by Ives.
2) All Other Doors: Elbow Catch No 2 by Ives.
6. Drawer Guides:
a. Keyboard / Pencil Drawers:

1) Steel ball bearings, 45 lb (20 kg) load rating minimum.
2) 3/4 extension, top mounting.
3) Category Four Approved Products. See Section 01 6200 for definitions of Categories:
   a) Series 2006 by Accuride.
   b) Article 422.14.345 by Haffele.
   c) Series KV8200 by Knape & Vogt.

b. Standard Drawers:
1) Full extension, steel ball bearings, 100 lb (45 kg) load rating.
2) Category Four Approved Products. See Section 01 6200 for definitions of Categories:
   a) Series 3832-Classic by Accuride.
   b) Article 422.04.552 by Haffele.
   c) Series KV8400 by Knape & Vogt.

c. Lateral Files / Serving Area Drawers:
1) Files/Drawers 30 inches (762 mm) wide and under:
   a) Full extension, steel ball bearings, 150 lb (68 kg) load rating.
   b) Category Four Approved Products. See Section 01 6200 for definitions of Categories:
      (1) Series 4034 by Accuride.
      (2) Article 422.17.550 by Haffele.
      (3) Series KV8505 by Knape & Vogt.
2) Files/Drawers over 30 inches (762 mm) wide:
   a) Duty, full extension, steel ball bearings, 200 lbs (90 kg) load rating.
   b) Category Four Approved Products. See Section 01 6200 for definitions of Categories:
      (1) Series 3640-A by Accuride.
      (2) Article 422.07.554 by Haffele.
      (3) Series KV8800 by Knape & Vogt.

C. Cabinet Door Bumpers:
1. Description:
   a. Polyurethane bumper to protect gypsum board from cabinet handle damage where cabinet handles hit gypsum wallboard surface.
2. Design Criteria:
   a. Clear.
   b. Peel adhesion.
   c. Size: 3/8 inch (9.5 mm diameter x 1/8 inch (3 mm) thick.
3. Type Two Acceptable Products:
   a. WS-34 Cylindrical Soft Durometer Cabinet Bumper by Anybumper.
   b. Equal as approved by Architect before installation. See Section 01 6200.

D. Pass Through Window Track:
1. Description:
   a. Aluminum track with nylon or ball bearing steel rollers.
2. Type One Acceptable Products:
   a. Ezy-Roll Aluminum Track Number P1092 ANOD by Knape and Vogt, which includes:
      1) 1085 vinyl glides: Four (4) each.
      2) 1093 upper channel: One (1) each.
      3) 1095 shoe: Two (2) each.
      4) 1097 rollers: Four (4) each.
      5) 1099 lower track: One (1) each.
   b. Equal as approved by Architect before bidding. See Section 01 6200.
3. Sliding Window Lock:
   a. Provide with four (4) keys.
   b. Class Two Quality Standard:
      1) Number 965 NP Rachet Lock by Knape & Vogt.

PART 2 - EXECUTION: Not Used

END OF SECTION

SECTION 06 4512

ARCHITECTURAL WOODWORK WOOD TRIM

PART 1 - GENERAL

1.1 SUMMARY

A. Products Furnished But Not Installed Under This Section:
   1. Fixed shelving not part of casework.
   2. Pass-through window wood trim.
   3. Wood trim at ceiling trim.

B. Related Requirements:
   1. Section 06 1100: 'Wood Framing' for wall blocking required for Wood Trim.
   2. Section 06 2001: ‘Common Finish Carpentry Requirements’:
      a. Installation of Wood Trim.
   3. Section 06 2210: Remaining Wood Trim.
   4. Section 06 4001: 'Common Architectural Woodwork Requirements':
      a. Approved Fabricators.
      b. General standards for materials and fabrication of Architectural Woodwork.
   5. Section 08 5619: 'Pass Windows' for pass-through window.

1.2 REFERENCES

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

B. Definitions:
   1. Grade: Unless otherwise noted, this term means Grade rules for Economy, Custom, and/or Premium Grade.
      a. Custom Grade: Typically specified for and adequately covers most high-quality architectural woodwork, providing a well-defined degree of control over a project’s quality of materials, workmanship, or installation.
   2. Plain Slicing: Most commonly used for hardwood plywood. The log is cut in half, and one half is placed onto a carriage and moved up and down past a fixed knife to produce the veneers. Veneer is sliced parallel to the pith of the log and approximately tangent to the growth rings to achieve flat-cut veneer. Each piece is generally placed in a stack and kept in order. One half log, sliced this way, is called a “flitch".
   3. Plain-Sawn: A hardwood figure developed by sawing a log lengthwise at a tangent to the annual growth rings. It appears as U-shaped or straight markings in the board’s face.
   4. Running Trim: Generally combined in the term “standing and running trim” and refers to random, longer length trims delivered to the jobsite (e.g., baseboard, chair rail, crown molding).

1.3 SUBMITTALS

A. Action Submittals:
   1. Shop Drawings:
      a. Include materials used, standing and running trim profiles, joint details, and hardware.
   2. Samples:
      a. Interior Hardwood for Transparent Finish:

1) Before performing work of this Section, prepare Control Sample, to match sample available from Owner, to be used as finishing standard for interior clear finished hardwood as specified in Section 09 9324.
2) Design Criteria:
   a) Provide 8 inch by 10 inch (200 mm by 255 mm) sample of Red Oak to match Owner provided stain color selected for Project.
   b) Control Sample will be used as performance standard for evaluating finish provided.

B. Informational Submittals:

PART 2 - PRODUCTS

2.1 MATERIALS

A. Manufacturers:
   1. Approved Fabricators. See Section 06 4001 for Approved Fabricators.

B. Performance / Design Criteria: Conform to requirements of Section 06 4001 'Common Architectural Woodwork Requirements'.
   1. Glue: Waterproof and of best quality.
   2. Factory-finish to match Owner selected sample as specified in Section 09 9324.

C. Architectural Woodwork Wood Trim:
   1. Interior Hardwood For Transparent Finish:
      a) Control Sample will be existing wood item from Project.
   2. Interior Wood For Opaque, Painted Finish:
      a. Applies to ceiling trim only.
      b. Solid wood shall be any species allowed by AWS Custom grade.

D. Shelves:
   1. Conform to applicable requirements of Sections 06 4001 and 06 4114.
   2. Use 3/4 inch (19 mm) Kortron or Melamine faced Panel Product with hot glued 3 mm thick PVC edge banding with eased edges. Apply banding on exposed edges with one inch (25 mm) return onto unexposed edges. Edge banding color to match Panel Product.

2.2 SOURCE QUALITY CONTROL

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

PART 3 - EXECUTION Not Used

END OF SECTION

SECTION 07 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.

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 (4.4 deg C).
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 (4.4 deg C) and 122 deg. F (50 deg. C).
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 (- 29 and 50 deg. C).
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 minus12 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) (minus 73.3 deg C to + 316 deg C).

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.
      c. Schedule showing joints requiring sealants. Show also backing and primer to be used.

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
      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.

B. Preconstruction Testing:

1. Pre-construction testing is not required when sealant manufacturer can furnish data acceptable to Architect based on previous testing for materials matching those of the Work.

C. Mockups:
1. Provide mockups including sealant and joint accessories to illustrate installation quality and color if requested by Architect or Project Manager.
a. Incorporate accepted mockup as part of Work.

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 (4 deg C) or subjected to sustained temperatures exceeding 90 deg F (32 deg C) or as per Manufacturer's written recommendations.
4. Do not use sealants that have exceeded shelf life of product.

1.7 FIELD CONDITIONS

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

1.8 WARRANTY

A. Manufacturer Warranty:
1. Signed warranties against adhesive and cohesive failure of sealant and against infiltration of water and air through sealed joint for period of three (3) years from date of Substantial Completion.
a. Manufacturer's standard warranty covering sealant materials.
b. Applicator’s standard warranty covering workmanship.

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 (Concrete, stone, masonry, and other nonporous surfaces typically do not require a primer. 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. Sealants At Exterior Building Elements:
a. Description:
1) Weathersealing expansion, contraction, perimeter, and other movement joints which may include all or part of the following for project:
a) Aluminum entrance perimeters and thresholds.
b) Columns.
c) Connections.
d) Door frames.
e) Joints and cracks around windows.
f) Masonry.
g) Wall penetrations.
h) Other joints necessary to seal off building from outside air and moisture.
b. Design Criteria:
1) Meet following standards for Sealant:
a) ASTM C920: Type S, Grade NS, Class 50 Use NT, M, G, A.
2) Limitations:
a) Do not use below-grade applications.
b) Do not use on surfaces that are continuously immersed or in contact with water.
c) Do not use on wet, damp, frozen or contaminated surfaces.
d) Do not use on building materials that bleed oils, plasticizers or solvents, green or partially vulcanized rubber gaskets or tapes.
3) Color:
a) Architect to select from Manufacturer's standard colors.

b) Match building elements instead of window (do not use white that shows dirt easily).

c. Category Four Approved Products. See Section 01 6200 for definitions of Categories:
1) Dow Corning:
a) Primer: 1200 Prime Coat.
b) Sealant: 791 Silicone Weatherproofing Sealant.
2) Momentive Performance Materials (formerly, GE Sealants & Adhesives):
a) Primer: SS4044 Primer.
b) Sealant: GE SCS2000 SilPruf Silicone Sealant & Adhesive.
3) Tremco:
a) Primer:
(1) Metal surface: No. 20 primer.
(2) Porous surfaces: No. 23 primer.
b) Sealant: Spectrum 1 Silicone Sealant.

3. Sealants At Exterior Sheet Metal And Miscellaneous:
a. Description:
1) Weathersealing expansion, contraction, perimeter, and other movement joints which may include all or part of the following for project:
a) Flashings.
b) Gutters.
c) Penetrations in soffits and fascias.
d) Roof vents and flues.
e) Lightning protection components.
b. Design Criteria:
1) Meet following standards for Sealant:
a) ASTM C920: Type S Grade NS, Class 25 (min) Use NT, M, G, A and O.
2) Limitations:
a) Do not use below-grade applications.
b) Do not use on surfaces that are continuously immersed or in contact with water.
c) Do not use on wet, damp, frozen or contaminated surfaces.
d) Do not use on building materials that bleed oils, plasticizers or solvents, green or partially vulcanized rubber gaskets or tapes.
c. Category Four Approved Products. See Section 01 6200 for definitions of Categories:
1) Dow Corning: 790 Silicone Building Sealant.
2) Momentive Performance Materials (formerly, GE Sealants & Adhesives): GE SCS2350 Silicone Elastomeric Sealant.
3) Tremco: Tremsil 600 Silicone Sealant.

4. Sealants At Expansion Joints in Exterior Concrete:
a. Expansion Joints:
1) Design Criteria:
a) Meet following standards for Sealant:
(1) ASTM C920: Type S, Grade NS, Class 100/50 Use T, NT, M, G, A, and O.
2) Sealant required at expansion for following areas:
a) Between entryway slabs and building foundations.
b) Between sidewalks and building foundations.
c) Miscellaneous vertical applications.
3) Sealant NOT required at expansion joints for following areas:
a) Within aprons and where aprons abut building foundations and sidewalks.
b) Within mowstrips and where mowstrips abut building foundations and sidewalks.
c) Within sidewalks.
4) Category Four Approved Products. See Section 01 6200 for definitions of Categories:
a) Dow Corning:
(1) Primer: 1200 Prime Coat.
(2) Sealant: 790 Silicone Building Sealant.
b) Sika:
(1) Primer: Sikasil Primer-2100.
(2) Sealant: Sikasil-728 NS Non-Sag Silicone Sealant.
b. Penetrations thru Concrete Walls:
1) Design Criteria:
a) Meet following standards for Sealant:

(1) ASTM C920: Type S, Grade NS, Class 100/50 Use T, NT, M, G, A, and O.

2) Category Four Approved Products. See Section 01 6200 for definitions of Categories:
   a) Dow Corning:
      (1) Primer: 1200 Prime Coat.
      (2) Sealant: 790 Silicone Building Sealant.
   b) Sika:
      (1) Primer: Sikasil Primer-2100.
      (2) Sealant: Sikasil-728 NS Non-Sag Silicone Sealant.

5. Sealants At Flat Drainage Exterior Concrete Structures:
   a. Expansion Joints and Control Joints:
      1) Description:
         a) One component (part) self-leveling silicon material that cures to ultra-low modulus silicone rubber upon exposure to atmospheric moisture.
         b) Cured silicone rubber remains flexible over entire temperature range expected in pavement applications.
      2) Design Criteria:
         a) Sealant is required at following areas:
            (1) Within flat drainage structures and at joints between flat drainage structures and other concrete elements.
         b) Meet following standards for Sealant: Self-leveling: ASTM D-5893; ASTM C-920, Type S, Grade P, Class 100/50; Use T, M, G, A, O.
      3) Category Four Approved Products. See Section 01 6200 for definitions of Categories:
         a) Dow Corning:
            (1) Primer: 1200 Prime Coat.
            (2) Sealant: 890-SL Silicone Building Sealant.
         b) Sika:
            (1) Primer: Primer: Sikasil Primer-2100.
            (2) Sealant: Sikasil-728 SL Self-leveling Silicone Sealant.
6. Sealants At Curbs And Gutters:
   a. Expansion Joints and Control Joints:
      1) Description:
         a) Effective for sealing transverse contraction and expansion joints, longitudinal, center line and shoulder joints in Portland cement concrete.
         b) One component (part) non-sag silicone material that cures to low modulus, silicone rubber upon exposure to atmospheric moisture. May be applied over wide temperature range.
      2) Design Criteria:
         a) Expansion joint sealant is required in following areas:
            (1) Within curbs and gutters at approved layout locations.
         b) Meet following standards for Sealant: Non-sag: ASTM C-920: Type S, Grade NS, Class 100/50, Use T, NT.
      3) Category Four Approved Products. See Section 01 6200 for definitions of Categories:
         a) Dow Corning:
            (1) Primer: 1200 Prime Coat.
            (2) Sealant: 888 Silicone Joint Sealant.
         b) Sika:
            (1) Primer: Primer: Sikasil Primer-2100.
            (2) Sikasil-728 NS Non-Sag Silicone Sealant.
7. Sealants At Precast Concrete Cap and Joint Covers (if Contractor Option ONE was selected in Section 03 4800):
   a. Description:
      1) Soft lead strip, when set and bedded in sealant, form cap which assures permanent elastic seal for any masonry joint as specified in Section 03 4800.
   b. Design Criteria:
      1) Meet following standards for Sealant:
         a) ASTM C920: Type S, Grade NS, Class 50 Use A, G, M.
         b) Strips should be of sufficient size to cover the joint width, plus percentage allowance for anticipated joint movement, plus 1/4 inch (6.4 mm).
   c. Category Four Approved Products. See Section 01 6200 for definitions of Categories:
      1) Dow Corning:

a) Primer: 1200 Prime Coat.
b) Sealant: 791 Silicone Weatherproofing Sealant.

2) Momentive Performance Materials (formerly, GE Sealants & Adhesives):
a) Primer: SS4044 Primer.
b) Sealant: GE SCS2000 SilPruf Silicone Sealant & Adhesive.

3) Sika:
a) Primer: Sikasil Primer-2100.
b) Sealant: Sikasil-728 NS Non-Sag Silicone Sealant.

4) Tremco:
a) Primer:
(1) Metal surface: No. 20 primer.
(2) Porous surfaces: No. 23 primer.
b) Sealant: Spectrum 1 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 specified.
a. Clean joint surfaces of residual sealant and other contaminates 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 and laitance followed by blasting with oil-free compressed air.
   b. Nonporous surfaces: Use two-cloth solvent wipe in accordance with ASTM C1193. Allow solvent to evaporate prior to sealant application.
   c. High-pressure water cleaning: Exercise care that water does not enter through failed joints.
   d. 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 contaminates capable of affecting sealant bond to joint surface using Manufacturer's recommended instructions for joint preparation methods.
   b. Remove dirt, dust, oils, wax, paints, and contamination capable of affecting primer and sealant bond.
   c. Clean concrete joint surfaces to remove curing agents and form release agents.

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

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. Apply caulking/sealant at temperatures below 40 deg F (4 deg C).
   b. Below-grade applications.
   c. Brass and copper surfaces.
   d. Materials bleeding oils, plasticizers, and solvents.
   e. Structural glazing and adhesive.
   f. Surfaces to be immersed in water for prolonged time.

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

C. Bond Breaker:

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

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

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

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. Perform five (5) tests for first 1,000 linear feet (300 meters) of applied silicone sealant and one (1) test for each 1,000 linear feet (300 meters) seal thereafter or perform one (1) test per floor per building elevation minimum.
   b. For sealants applied between dissimilar materials, test both sides of joints.
2. Sealants failing adhesion test shall be removed, substrates cleaned, sealants re-installed, and re-testing performed.
3. Maintain test log and submit report to Architect indicating tests, locations, dates, results, and remedial actions.

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 08 0601

HARDWARE GROUP AND KEYING SCHEDULES

PART 1 - GENERAL

1.1 SUMMARY

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

1.2 REFERENCES

A. Definitions:
   1. Access Door Exit Device: See Exit Device.
   2. Acoustic Seal: Attached to door to reduce external noise. Perimeter seals reduce potential for flanking noise, a term used to describe leakage of a sound across a barrier.
   3. Active Door (or leaf): In paired or double doors, hinged door leaf that opens first and the one to which the lock is applied.
   4. Astragal: Molding or strip whose purpose is to cover or close gap between edges of pair of doors. Astragals provide a weather or sound seal, minimize passage of light or retard passage of smoke or flame.
      a. Overlapping Astragal: One-piece astragal attached to one door only and overlapping other door when in closed position.
      b. Split Astragal: Two-piece astragal, one piece of which is surface mounted on each door and provided with means of adjustment to abut other piece and provide a seal.
   5. Builders Hardware Manufacturer's Association (BHMA) Hardware Functions:
      a. F75 Passage Latch: Latch bolt operated by lever from either side at all times.
      b. F76 Privacy Lock: Latch bolt operated by lever from either side. Outside lever locked by push button inside and unlocked by emergency key from outside or rotating lever from inside.
      c. F81 Office Door Lock: Dead locking latch bolt operated by lever from either side, except when outside lever is locked by turn button in inside lever. When outside lever is locked, latch bolt is operated by key in outside lever or by rotating inside lever. Turn button must be manually rotated to unlock outside lever.
      d. F84 Classroom Deadlock: Dead locking latch bolt operated by lever from either side, except when outside lever is locked, latch bolt is operated by key in outside lever or by rotating inside lever.
      e. F86 Utility Space Door Lock: Dead locking latch bolt operated by key in outside lever or by rotating inside lever. Outside lever is always fixed.
      f. F91 Store Door Lock: Deadlocking latch operated by either lever. Key in either lever locks / unlocks both levers.
      g. F109 Entrance Lock: Turn/push button locking: Pushing and turning button disengages outside lever, requiring using of key until button is manually unlocked. Push-button locking: Pushing button disengages outside lever until unlocked by key or by turning inside lever. Disengages outside spindle from latch when locked.
      h. E2142 Deadbolt: Dead bolt operated by key from either side. Bolt automatically dead locks when fully thrown.
      i. E2152 Deadbolt: Dead bolt operated by key from outside and turn unit from inside. Bolt automatically dead locks when fully thrown.
   6. Change Key: Key that operates only one cylinder or one group of keyed alike cylinders in a keying system.
   7. Closer: Device or mechanism to control closing of swing door. May be overhead or floor mounted and either exposed or concealed.

8. Coordinator: Device or mechanism which controls order of closing of pair of swing doors; used with doors equipped with overlapping astragals and certain panic and fire exit hardware which requires inactive leaf to close before active leaf.
9. Cylinder: Cylindrical-shaped assembly (complete operating unit) containing tumbler mechanism and keyway (plug, shell, tumblers, springs and actuating device), into which key is inserted to operate lock and can only be actuated by correct key.
    a. Mortise: Threaded surface which screws directly into a lock case, with a cam engaging lock mechanism.
    b. Rim: Mounted on surface of door independently of lock, usually by screws from reverse sid, and engaging with lock mechanism by means of tailpiece or metal extension.
10. Deadbolt (of a lock): Lock bolt having no spring action nor bevel, and which is operated by key or turn piece.
11. Dummy Trim: Trim only, without lock; usually used on inactive door in pair of doors.
12. Dust-Proof Strike: Strike with spring plunger that completely fills bolt hole when bolt is not projected.
13. Emergency Egress Exit Device: See Exit Device.
14. Exit Device: Latching mechanism for swinging doors designed to be operable in direction of egress travel and to provide exiting for occupants in emergency. Latching mechanism release through pressure on touch or cross bar mortised or mounted on push side of door. There are two classifications: Panic Exit Hardware and Fire Exit Hardware, and three types within each classification:
    a. Mortise Type: Lock mechanism mortised into edge of door or concealed with door.
    b. Rim Type: Lock mechanism mounted on interior face of door.
    c. Vertical Rod: Surface or concealed, having latches in or on top and/or bottom of door and activated by cross bar through rod linkage extending vertically on or in lock stile of door.
15. Fire Exit Hardware: Metal device attached to back of door frame jamb at its base, to secure frame to the floor, may be either fixed or adjustable in height. See Exit Device.
16. Flush Bolt: Rods or bolts that are mounted flush with edge or face of inactive door to lock door to frame at head and/or sill. Flush bolt mounted in edge is operated by means of recessed lever. May be manual or automatic.
17. Grand Master Key: Key that operates locks in several groups, each of which has its own master key.
18. Handleset: Term describing lock trim with handle and thumbpiece on exterior of door, and knob/lever on interior.
19. Hardware: Any mechanism which is designed to perform operable function in use of door and frame.
20. Hinge: Two plates joined together by pin and attached to door and its frame whereby door is supported and is enabled to swing or move.
21. Holder: Device that holds door open at one or more selected positions.
22. Inactive Door (or leaf): Leaf of pair of doors that does not contain lock, but is bolted when closed, and to which strike is fastened to receive latch or bolt of active door.
23. Kick Plate: Protective plate applied on lower rail of door to prevent door from being marred.
24. Latch Bolt: Beveled spring bolt, usually operated when either knob or lever is turned, or when thumbpiece which operates handleset is pushed down.
25. Latchset: Non-locking device which contains only a latch bolt, a means of operating said latch and all required trim.
26. Leaf (of pair of doors): One of two doors forming pair of doors.
27. Lever Handle: Bar-like grip which is rotated about horizontal axis at one of its ends to operate a latch.
28. Lockset: Lock, complete with trim, such as knobs, escutcheons or handles.
29. Low-Energy Swing Door Operators: Device that operates swing door that opens or helps open door automatically, waits then closes it at reduced speed to levels deemed safe for disabled users. Commonly referred to as a Handicap door operator.
30. Master Key: Key that operates all master keyed locks or cylinders in group, each lock or cylinder usually operated by its own change key.
31. Mullion: Fixed or movable post dividing opening vertically.
32. Panic Exit Hardware: Hardware similar to Exit Hardware, but which has been tested and labeled or use only on emergency exit doors which are not fire doors. See Exit Device.
33. Passage Function: Knob or lever set most commonly used in hallways where locking feature is not required.

34. Pivot: Hinging device embodying fixed pin and single joint.
35. Pull: Handle of grip designed for attachment to door to facilitate opening and closing.
36. Push: Plate applied to lock stile to protect door against soiling and wear.
37. Single Cylinder Entrance Handleset: Key operates deadbolt from outside; turnpiece operates deadbolt from the inside.
38. Single Dummy: Knob/lever surface mounted on interior or exterior of door which does not turn any mechanism.
39. Silencer: Small piece of resilient material attached to stop on door frame to cushion closing of door.
40. Smoke Gasket: Brush seal used on doors to reduce passage of smoke and gasses.
41. Stop: Device to limit swing or movement of door at certain point.
42. Threshold: Strip fastened to floor beneath door, usually required to cover joint where two types of floor material meet.
43. Thumbpiece or Thumbturn: Lock trim component which typically is used to lock deadbolt from interior side of door.
44. Turnpiece: Small knob, lever or tee turn with spindle attached for operating deadbolt of lock or mortise bolt. Also termed Thumb Turn. Used only on single cylinder operations.
45. Weatherstrip: Material or device applied to door edges or to inner door frame edges to close clearance opening and minimize or restrict passage of air, moisture, sound, smoke, and/or dirt.

B. Reference Standards:
   1. American National Standards Institute / Builders Hardware Manufacturer's Association:
      a. ANSI/BHMA A156.1, ‘Butts and Hinges’.
      b. ANSI/BHMA A156.12, ‘Interconnected Locks & Latches’.
      c. ANSI/BHMA A156.13, ‘Mortise Locks’.
      d. ANSI/BHMA A156.16, ‘Auxiliary Hardware’.
      e. ANSI/BHMA A156.18, ‘Materials and Finishes’.
      f. ANSI/BHMA A156.2, ‘Bored and Preassembled Locks and Latches’.
      g. ANSI/BHMA A156.21, ‘Thresholds’.
      h. ANSI/BHMA A156.22, ‘Door Gasketing and Edge Seal Systems’.
      i. ANSI/BHMA A156.3, ‘Exit Devices’.
      j. ANSI/BHMA A156.4, ‘Door Controls - Closers’.
      k. ANSI/BHMA A156.5, ‘Cylinders and Input Devices for Locks’.
      l. ANSI/BHMA A156.6, ‘Architectural Trim’.
      m. ANSI/BHMA A156.7, ‘Template Hinge Dimensions’.
      n. ANSI/BHMA A156.8, ‘Door Controls – Overhead Stops and Holders’.

1.3 DELIVERY, STORAGE, AND HANDLING

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

PART 2 - HARDWARE GROUPS

2.1 INTERIOR DOORS

A. Single Interior Doors:
   1. Group 22B:
      a. 1 set: Smoke Gaskets.
      b. 3 each: Hinges.
      c. 1 each: Lockset Function F86.

   2. **Group 26**:
      a. 1 set: Smoke Gaskets.
      b. 1 each: Acoustic Seal.
      c. 3 each: Hinges.
      d. 1 each: Lockset Function F81.
      e. 1 each: Stop.
      f. 1 each: Threshold.

PART 3 - KEYING SCHEDULE for FINISH HARDWARE

3.1 KEYING SCHEDULE

1. Remaining Stake Suite Doors (excluding Exterior Door):

Key	Stamped	Amount	Doors Operated by Key
XAA16	STK	20	Key AA16 will also open XAA1.

a. Keys to Stake President's Office will open Stake Suite doors.

END OF SECTION

SECTION 08 1213

HOLLOW METAL FRAMES

PART 1 - GENERAL

1.1 SUMMARY

A. Products Furnished But Not Installed Under This Section:
   1. Hollow metal frames.

B. Related Requirements:
   1. Section 06 2024: 'Door, Frame, And Finish Hardware Installation' for installation.
   2. Section 06 4114: 'Wood-Veneer-Faced Architectural Cabinets' for pass-through window and hardware.

1.2 REFERENCES

A. Reference Standards:
   1. American Architectural Manufacturers Association / Window & Door Manufacturers Association / Canadian Standards Association:
      a. AAMA/WDMA/CSA 101/I.S.2/A440-11, 'North American Fenestration Standard/Specification for windows, doors, and skylights'.
   2. ASTM International:
      a. ASTM A568/A568M-13a, 'Standard Specification for Steel, Sheet, Carbon, Structural, and High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, General Requirements for.
      b. ASTM A653/A653M-13, 'Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process'.
   3. Steel Door Institute:
      a. SDI A250.8-2003(R2008), 'Standard Steel Doors and Frames'.
      b. SDI A250.11-2012, 'Recommended Erection Instructions for Steel Frames'.

1.3 SUBMITTALS

A. Informational Submittals:
   1. Copy of SDI A250.11.

PART 2 - PRODUCTS

2.1 MANUFACTURED UNITS

A. Suppliers:
   1. Category One Approved VMR Suppliers. See Section 01 6200 for definitions of Categories and Section 01 4301 for Qualification Requirements:
      a. Architectural Building Supply, Salt Lake City, UT www.cookandboardman.com:
         1) Contact Information: Russ Farley: phone (800) 574-4369, fax 801-484-6817, or e-mail russf@absdoors.com.
      b. Beacon Metals Inc, Salt Lake City, UT www.beacon-metals.com:
         1) Contact Information: Jared Butler: phone (801) 486-4884, cell (435) 216-2297, FAX 801-485-7647, or e-mail Jared@beacon-metals.com.

B. Manufacturers:

1. Category One Approved Manufacturers. See Section 01 6200 for definitions of Categories.
   a. Any current member of Steel Door Institute.

C. Frames:
1. Cold rolled furniture steel.
   a. Interior Frames: 16 ga. (1.6 mm).
   b. Exterior Frames: 14 ga. (1.9 mm).
2. Provide labeled frame to match fire rating of door.
3. Finish:
   a. Use one of following systems:
      1) Prime surfaces with rust inhibiting primer.
      2) Galvanize.
4. Anchors: 16 US ga (1.6 mm) minimum meeting UL or other code acceptable requirements for door rating involved.

D. Fabrication:
1. General Requirements:
   a. Frames shall be welded units. Provide temporary spreader on each welded frame.
   b. Provide Manufacturer's gauge label for each item.
   c. Make breaks, arrises, and angles uniform, straight, and true. Accurately fit corners.
2. Frame width dimension:
   a. Fabricate frame 1/8 inch (3 mm) wider than finished wall thickness as described in Contract Documents.
3. Provide mortar guards at strikes and hinges.
4. Anchors:
   a. Provide three jamb anchors minimum for each jamb. On hinge side, install one anchor at each hinge location. On strike side, install one anchor at strike level and anchors at same level as top and bottom hinges. Tack weld anchors on frames intended for installation in framed walls.
   b. Frames installed before walls are constructed shall be provided with extended base anchors in addition to other specified anchors.
   c. Anchor types and configurations shall meet wall conditions.

PART 3 - EXECUTION: Not Used

END OF SECTION

SECTION 08 1429

FLUSH WOOD DOORS: Factory-Finished, Clear

PART 1 - GENERAL

1.1 SUMMARY

A. Products Furnished But Not Installed Under This Section:
   1. Factory-finished flush wood doors.

B. Related Requirements:
   1. Section 06 2024: 'Door, Frame, And Finish Hardware Installation' for installation.

1.2 REFERENCES

A. Abbreviations And Acronyms:
   1. AWS: Architectural Woodwork Standards (formerly AWI).
   2. FD: Fire-resistant core, fire-resistant materials assembled to stiles and rails according to methods prescribed by the testing agency to meet rigorous smoke, flame, and pressure tests.
   3. FD-5: Core with 2 layers on each side.
   4. ME: Matching edges, i.e., vertical edges same as decorative faces.
   5. PC: Particleboard core, solid core door with stiles and rails bonded to the core and abrasive planed flat prior to the application of the faces.
   6. PC-5: Core with 2 layers on each side.

B. 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), 2nd Edition, 2014.

C. Definitions:
   1. Adhesive, Type I (fully waterproof): Forms a bond that will retain practically all of its strength when occasionally subjected to a thorough wetting and drying; bond shall be of such quality that specimens will withstand shear and the two-cycle boil test specified in ANSI/HPVA HP (latest edition).
   2. Book-Match: Matching between adjacent veneer leaves on one panel face. Every other piece of veneer is turned over so that the adjacent leaves are “opened” as two pages in a book. The fibers of the wood, slanting in opposite directions in the adjacent leaves, create a characteristic light and dark effect when the surface is seen from an angle.
   3. Core: The material (typically, veneer, lumber, particleboard, medium-density fiberboard, or a combination of these) on which an exposed surface material (typically, veneer or HPDL) is applied.
   4. Core, Solid: The innermost layer or section in flush door construction. Typical constructions are as follows:
      a. Core, Mineral: A fire-resistant core material generally used in wood doors requiring fire ratings of 3/4 hours or more.
      b. Particleboard - A solid core of wood or other lignocellulose particles bonded together with a suitable binder, cured under heat, and pressed into a rigid panel in a flat-platen press.
   5. Face Veneer: The outermost exposed wood veneer surface of a veneered wood door, panel, or other component exposed to view when the project is completed.
   6. Fire-rated: Fire-retardant particleboard with an Underwriters’ Laboratory (UL) stamp for Class 1 fire rating (Flame Spread 20, Smoke Developed 25). Fire-rated doors are available with particleboard and mineral cores for ratings up to 1-1/2 hours.

7. Fire-rated Door: A door made of fire-resistant material that can be closed to prevent the spread of fire and can be rated as resisting fire for 20 minutes (1/3 hour), 30 minutes (1/2 hour), 45 minutes (3/4 hour) (C), 1 hour (B), or 1-1/2 hours (B). The door must be tested and carry an identifying label from a qualified testing and inspection agency.
8. Flitch: A hewn or sawn log made ready for veneer production or the actual veneer slices of one half log, kept in order, and used for the production of fine plywood panels.
9. Grade: Unless otherwise noted, this term means Grade rules for Economy, Custom, and/or Premium Grade.
    a. Custom Grade: Typically specified for and adequately covers most high-quality architectural woodwork, providing a well-defined degree of control over a project's quality of materials, workmanship, or installation.
    b. Premium Grade: The highest Grade available in both material and workmanship where the highest level of quality, materials, workmanship, and installation is required.
10. Plain Slicing: Most commonly used for hardwood plywood. The log is cut in half, and one half is placed onto a carriage and moved up and down past a fixed knife to produce the veneers. Veneer is sliced parallel to the pith of the log and approximately tangent to the growth rings to achieve flat-cut veneer. Each piece is generally placed in a stack and kept in order. One half log, sliced this way, is called a "flitch."
11. Running Match: Each panel face is assembled from as many veneer leaves as necessary. Any portion left over from one panel may be used to start the next.
12. Stile-and-Rail Construction: A technique often used in the making of doors, wainscoting, and other decorative features for cabinets and furniture. The basic concept is to capture a panel within a frame, and in its most basic form it consists of five members: the panel and the four members that make up the frame. The vertical members of the frame are called stiles, while the horizontal members are known as rails.

D. Reference Standards:
1. American Architectural Manufacturers Association / Window & Door Manufacturers Association / Canadian Standards Association:
    a. AAMA/WDMA/CSA 101/I.S.2/A440-11, 'North American Fenestration Standard/Specification for windows, doors, and skylights'.
2. ASTM International:
    a. ASTM C1036-11, 'Standard Specification for Flat Glass'.
    b. ASTM C1048-12, 'Standard Specification for Heat-Treated Flat Glass—Kind HS, Kind FT Coated and Uncoated Glass'.
3. Hardwood, Plywood, and Veneer Association:
    a. HPVA HP-1-2009 'Standard for Hardwood and Decorative Plywood'.
4. National Particleboard Association / Composite Panel Association:
    a. NPA A208.1-2009, 'Particleboard'.

1.3 SUBMITTALS

A. Action Submittals:
1. Shop Drawings:
    a. Schedule showing type of door at each location. Included shall be size, veneer, core type, fire rating, hardware prep, openings, blocking, etc.
    b. Indicate factory finish color and type.

B. Closeout Submittals:
1. Include following information in Operations And Maintenance Manuals specified in Section 01 7800:
    a. Record Documentation:
        1) Manufacturers Documentation:
            a) Manufacturer's product literature on doors and factory finish.
            b) Maintenance and repair instructions.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Delivery And Acceptance Requirements:
1. Deliver in clean truck and, in wet weather, under cover.
2. Deliver to building site only after plaster, cement, and taping compound are completed and dry and after interior painting operations have been completed.
3. Individually wrap in polyethylene bags for shipment and storage.

B. Storage And Handling Requirements:
1. Store doors in a space having controlled temperature and humidity range between 25 and 55 percent.
2. Store flat on level surface in dry, well ventilated space.
3. Cover to keep clean but allow air circulation.
4. Do not subject doors to direct sunlight, abnormal heat, dryness, or humidity.
5. Handle with clean gloves and do not drag doors across one another or across other surfaces.
6. Leave shipping bag on door after installation until immediately before substantial completion inspection.
7. Doors have been acclimated to the field conditions for a minimum of 72 hours before installation is commenced.

1.5 WARRANTY

A. Manufacturer Warranty:
1. Manufacturer's standard full door warranty for lifetime of original installation.
a. Warranty shall include finishing, hanging, and installing hardware if manufacturing defect was discovered after door was finished and installed.
b. Warranty to include defects in materials including following:
1) Delaminating in any degree.
2) Warp or twist of 1/4 inch (6 mm) or more in door panel at time of one-year warranty inspection.
3) Telegraphing of core assembly: Variation of 1/100 inch (0.25 mm) or more in 3 inch (75 mm) span.

PART 2 - PRODUCTS

2.1 MANUFACTURED UNITS

A. Suppliers:
1. Category One Approved VMR Suppliers. See Section 01 6200 for definitions of Categories and Section 01 4301 for Qualification Requirements:
a. Architectural Building Supply, Salt Lake City, UT www.cookandboardman.com:
1) Contact Information: Russ Farley: phone (800) 574-4369, fax 801-484-6817, or e-mail russf@absdoors.com.
b. Beacon Metals Inc, Salt Lake City, UT www.beacon-metals.com:
1) Contact Information: Jared Butler: phone (801) 486-4884, cell (435) 216-2297, FAX 801-485-7647, or e-mail Jared@beacon-metals.com.

B. Manufacturers:
1. Category Four Approved Manufacturers. See Section 01 6200 for definitions of Categories.
a. Graham Wood Doors, Mason City, IA.
b. Marshfield Door Systems Inc, Marshfield, WI.
c. VT Industries, Holstein, IA.

C. Wood Doors:
1. Type: AWS PC-5ME or FD-5ME.
2. Grade: AWS Premium, except face veneer.

3. Fully Type I Construction: Adhere all glue lines with Type I adhesive, including veneer lay-up.
4. Face Veneer:
   a. Plain sliced Red Oak meeting requirements of AWS Grade A, 1/50 inch (0.5 mm) thick minimum immediately before finishing.
   b. Face veneers shall be running book matched.
5. Core:
   a. Fully bonded to stiles and rails and sanded as a unit before applying veneers.
   b. Non-Rated And Fire-rated, AWS FD 1/3:
      1) 32 lb density meeting requirements of ANSI A208.1 Mat Formed Wood Particle Board, Grade 1-L-1 minimum.
      2) Stiles:
         a) 1-3/8 inches (35 mm) deep minimum before fitting.
         b) Stile face to be hardwood matching face veneer material, thickness manufacturer's standard.
      3) Rails:
         a) 1-1/8 inches (28 mm).
         b) Manufacturer's option.

D. Fabrication:
1. Doors shall be factory-machined. Coordinate with Section 08 1213 and Sections under 08 7000.

E. Finishes:
1. Factory Finishing:
   a. Applied by Door Manufacturer before leaving factory.
   b. Performance / Design Criteria:
      1) Finish factory-finish to match Owner selected sample as specified in Section 09 9324.
   c. Match existing Project Color Scheme:
      1) Control Sample provided by Owner:
         a) Control Sample will be existing wood item from Project.
   d. Finish: AWS Finish System TR-6 Catalyzed Polyurethane Premium Grade for unfilled, open-grain woods.

2.2 SOURCE QUALITY CONTROL

A. Inspections:
1. Verification of Performance:
   a. Doors shall have following information permanently affixed on top of door:
      1) Manufacturer:
      2) Door designation or model.
      3) Veneer species.
      4) Factory finish.
2. Clear Finished Hardwood:
   a. Color matches Owner provided sample specified in Section 09 9324.

PART 3 - EXECUTION: Not Used

END OF SECTION

SECTION 08 5619

PASS WINDOWS

PART 1 - GENERAL

1.1 SUMMARY

A. Products Furnished But Not Installed Under This Section:
   1. Pass-through window as described in Contract Documents.

B. Related Requirements:
   1. Section 06 2001: 'Common Finish Carpentry Requirements' for Installation of window units.
   2. Section 06 4512: 'Architectural Woodwork Wood Trim' for wood trim at window.
   3. Section 08 8100: 'Glass Glazing' for quality of glass.
   4. Section 09 9124: 'Interior Painted Metal' for finish Painting.

1.2 REFERENCES

A. Reference Standards:
   1. ASTM International:
      a. ASTM A1008/A1008M-15, ‘Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable’.
      b. ASTM C1036-11e1, ‘Standard Specification for Flat Glass’.

1.3 SUBMITTALS

A. Action Submittals:
   1. Product Data:
      a. Manufacturer’s literature or cut sheet and maintenance instructions.
      b. Glazing information.
      c. Color and finish selection.
   2. Shop Drawings:
      a. Installation requirements including rough opening size, attachments, and anchors.
      b. Details of keyed locking device.

B. Informational Submittals:
   1. Manufacturer Instructions:
      a. Manufacturer’s standard printed installation instructions.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Delivery And Acceptance Requirements:
   1. Ship glazed pass window units in wooden crates.

B. Storage And Handling Requirements:
   1. Store in crate in safe, dry location until ready for installation.

PART 2 - PRODUCTS

2.1 ASSEMBLIES

A. Pass Through Window Track:
   1. Description:
      a. Aluminum track with nylon or ball bearing steel rollers.
   2. Type One Acceptable Products:
      a. Ezy-Roll Aluminum Track Number P1092 ANOD by Knape and Vogt, which includes:
         1) 1085 vinyl glides: Four (4) each.
         2) 1093 upper channel: One (1) each.
         3) 1095 shoe: Two (2) each.
         4) 1097 rollers: Four (4) each.
         5) 1099 lower track: One (1) each.
      b. Equal as approved by Architect before bidding. See Section 01 6200.
   3. Sliding Window Lock:
      a. Provide with four (4) keys.
      b. Class Two Quality Standard:
         1) Number 965 NP Rachet Lock by Knape & Vogt.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Installation as per Section 06 2001: 'Common Finish Carpentry Requirements':
   1. Set window frames level, plumb and square without distortion.

END OF SECTION

SECTION 08 7101

COMMON FINISH HARDWARE REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. General requirements for finish hardware related to architectural wood and hollow metal doors.

B. Related Requirements:
   1. Section 06 2024: 'Door, Frame, And Finish Hardware Installation' for installation of hardware.
   2. Section 06 4114: 'Wood-Veneer-Faced Architectural Cabinets' for architectural woodwork hardware.
   3. Section 08 0601: 'Hardware Group and Keying Schedules'.

1.2 REFERENCES

A. Association Publications:
   1. Builders Hardware Manufacturers Association (BHMA), 355 Lexington Avenue, 15th Floor, New York, NY 10017-6603, Tel: 212-297-2122 Fax: 212-370-9047, www.buildershardware.com.

B. Reference Standards:
   1. American National Standards Institute / Builders Hardware Manufacturers Association:
      a. ANSI/BHMA A156.1-2013, 'Butts & Hinges'.
      b. ANSI/BHMA A156.3-2008, 'Exit Devices'.
      c. ANSI/BHMA A156.4-2013, 'Door Controls-Closers'.
      d. ANSI/BHMA A156.5-2014, 'Cylinders and Input Devices for Locks'.
      e. ANSI/BHMA A156.6-2010, 'Architectural Door Trim'.
      f. ANSI/BHMA A156.12-2013, 'Interconnected Locks & Latches'.
      g. ANSI/BHMA A156.13-2012, 'Mortise Locks & Latches, Series 1000'.
      h. ANSI/BHMA A156.18-2012, 'Materials and Finishes'.
      i. ANSI/BHMA A156.19-2013, 'Power Assist and Low Energy Power Operated Doors'.
      j. ANSI/BHMA A156.21-2014, ''American National Standard for Thresholds'.
      k. ANSI/BHMA A156.30-2014, 'American National Standard for High Security Cylinders'.
      l. ANSI/BHMA A156.36-2010, 'American National Standard for Auxiliary Locks'.
   2. International Code Council / American National Standards Institute:
      a. ICC / ANSI A117.1-2009, 'Accessible and Usable Buildings and Facilities'.
   3. Underwriters Laboratories (UL):
      a. UL 10B, 'Fire Tests of Door Assemblies'.
      b. UL 10C, 'Positive Pressure Fire Tests of Door Assemblies'.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Hardware Templates:
      a. Provide hardware templates to Sections 08 1213, 08 1313, and 08 1429 within fourteen (14) days after Architect approves hardware schedule.
      b. Supply necessary hardware installation templates to Section 06 2024 before pre-installation conference.

1.4 SUBMITTALS

A. Action Submittals:
   1. Product Data:
      a. Manufacturer's cut sheets.
      b. Two (2) copies of Manufacturer's installation, adjustment, and maintenance instructions for each piece of hardware. Include one (1) set in 'Operations And Maintenance Manual' and send one (1) set with hardware when delivered.
      c. Copy of hardware schedule.
      d. Written copy of keying system explanation.
   2. Shop Drawings:
      a. Submit hardware schedule indicating hardware to be supplied.
      b. Schedule shall indicate details such as proper type of strikeplates, spindle lengths, hand, backset, and bevel of locks, hand and degree opening of closer, length of kickplates, length of rods and flushbolts, type of door stop, and other necessary information necessary to determine exact hardware requirements.

B. Closeout Submittals:
   1. Include following in Operations And Maintenance Manual specified in Section 01 7800:
      a. Operations and Maintenance Data:
         1) Manufacturer's installation, adjustment, and maintenance instructions for each piece of hardware.
      b. Record Documentation:
         1) Manufacturers documentation:
            a) Manufacturer's literature and/or cut sheets.
            b) Include keying plan and bitting schedule.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Storage And Handling Requirements:
   1. Neatly and securely package hardware items by hardware group and identify for individual door with specified group number and set number used on Supplier's hardware schedule.
   2. Include fasteners and accessories necessary for installation and operation of finish hardware in same package.

PART 2 - PRODUCTS

2.1 SUPPLIERS

A. New Projects:
   1. Category One VMR Approved Suppliers. See Section 01 6200 for definitions of Categories:
      a. Architectural Building Supply, Salt Lake City, UT www.cookandboardman.com:
         1) Contact Information: Russ Farley, phone (800) 574-4369, fax 801-484-6817, or e-mail russf@absdoors.com.
      b. Beacon Metals Inc, Salt Lake City, UT www.beacon-metals.com:
         1) Contact Information: Jared Butler, phone (801) 486-4884, cell (435) 216-2297, FAX 801-485-7647, or e-mail Jared@beacon-metals.com.

B. Existing Projects (Doors and Door Hardware):
   1. Category One VMR Approved Suppliers. See Section 01 6200 for definitions of Categories:
      a. Architectural Building Supply, Salt Lake City, UT www.cookandboardman.com:
         1) Contact Information: Russ Farley: phone (800) 574-4369, fax 801-484-6817, or e-mail russf@absdoors.com.
      b. Beacon Metals Inc, Salt Lake City, UT www.beacon-metals.com:
         1) Contact Information: Jared Butler: phone (801) 486-4884, cell (435) 216-2297, FAX 801-485-7647, or e-mail Jared@beacon-metals.com.

C. Existing Projects (Door Hardware Only):
   1. Category One VMR Approved Suppliers. See Section 01 6200 for definitions of Categories:
      a. Architectural Building Supply, Salt Lake City, UT www.cookandboardman.com:
         1) Contact Information: Russ Farley: phone (800) 574-4369, fax 801-484-6817, or e-mail russf@absdoors.com.
      b. Beacon Metals Inc, Salt Lake City, UT www.beacon-metals.com:
         1) Contact Information: Jared Butler: phone (801) 486-4884, cell (435) 216-2297, FAX 801-485-7647, or e-mail Jared@beacon-metals.com.
      c. Clark Security Products, Salt Lake City, UT www.clarksecurity.com:
         1) Contact Information: John Williams: phone (235) 232-2089 or e-mail john.williams@clarksecurity.com.
      d. Intermountain Lock & Security Supply, Salt Lake City, UT www.imlss.com:
         1) Contact Information: Joe Pehrson: cell (801) 419-4591 or e-mail joe.pehrson@imlss.com.

2.2 FINISHES

A. Hardware Finishes:
   1. Finishes to match existing hardware.

2.3 FASTENERS

A. Fasteners shall be of suitable types, sizes and quantities to properly secure hardware. Fasteners shall be of same material and finish as hardware unless otherwise specified. Fasteners exposed to weather shall be non-ferrous or corrosion resisting steel.

PART 3 - EXECUTION

3.1 PREPARATION

A. Before ordering materials, examine Contract Documents to be assured that material to be ordered is appropriate for thickness and substrate to which it is to be secured and will function as intended.

END OF SECTION

SECTION 08 7102

HANGING DEVICES

PART 1 - GENERAL

1.1 SUMMARY

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

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

PART 2 - PRODUCTS

2.1 MANUFACTURED UNITS

A. Manufacturers:
   1. Manufacturer Contact List:
      a. Hager Companies, St Louis, MO www.hagerhinge.com.
      b. Ives, New Haven, CT www.iveshardware.com.
      c. McKinney, Scranton, PA www.mckinneyhinge.com.
      d. PBB, Ontario, CA www.pbbinc.com.
      e. Stanley, New Britain, CT www.stanleyworks.com.

B. Hinges:
   1. Sizes:
      a. 1-3/4 inch (45 mm) doors and fire-rated doors in metal frames:
         1) Standard: 4-1/2 inches by 4-1/2 inches (115 mm by 115 mm).
         2) Wide Throw: 4-1/2 inches (115 mm) by width required.
      b. 1-3/8 inch 35 mm wood or metal doors: 3-1/2 inches by 3-1/2 inches (89 mm by 89 mm).
   2. Use non-removable pins on exterior opening doors.
   3. Category Four Approved Products. See Section 01 6200 for definitions of Categories:
      a. Interior:
         1) Hager: BB 1279.
         2) Ives: 5BBI.
         3) McKinney: TA 2714.
         4) MacPro / McKinney: MPB79.
         5) PBB: BB81.
         6) Stanley: FBB 179.

PART 3 - EXECUTION: Not Used

END OF SECTION

SECTION 08 7103

SECURING DEVICES

PART 1 - GENERAL

1.1 SUMMARY

1. Items for architectural wood or hollow metal doors:
   a. Flush bolts.
   b. Locksets and latchsets.
   c. Deadbolts.
   d. Cylinders.
   e. Interior exit devices.
   f. Surface bolts.

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

1.2 REFERENCES

A. Definitions:
   1. Grade 1 Heavy Duty Key-In Lever Cylindrical Lockset:
      a. Performance Features:
         1) Exceeds 1,000,000 ANSI cycles.
         2) Clutching mechanism standard.
         3) Thru-bolt design and heavy-duty spring tension provides longer performance life and prevents lever sag.
         4) ADA-compliant thumbturn.
         5) Mortise case is easily field reversible.
         6) Pre-assembled trims with spring-loaded spindles automatically adjust to door thickness.
         7) Partial security separator prevents spindle manipulation.
         8) Anti-friction throwbolt.
   2. Grade 2 Standard Duty Key-In Lever Cylindrical Lockset:
      a. Performance Features:
         1) Exceeds 400,000 ANSI cycles.
         2) Single motion egress provides easy emergency exit.
         3) Full 1 inch (25 mm) throwbolt with saw resistant hardened steel roller pin.
         4) Anti-drill design deadbolt. Two (2) ball bearings inserted to prevent drill attacks.
         5) ADA-compliant thumbturn.

1.3 DELIVERY, STORAGE, AND HANDLING

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

PART 2 - PRODUCTS

2.1 MANUFACTURED UNITS

A. Manufacturers:
   1. Manufacturer List:

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

B. General:
1. Backsets shall be 2-3/4 inches (70 mm).
2. Furnish lead shields where required.

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

D. Locksets And Latchsets:
1. Design Criteria:
a. Grade 1 Heavy Duty Key-In Lever Cylindrical Lockets (Used only in Meetinghouse Module doors with CES Seminary and Institute additions):
1) ANSI/BHMA A156.02 Series 4000 Grade 1.
2) Meet UL 3 hour fire rating.
3) Meet ADA Compliant ANSI A117.1 Accessibility Code.
4) Door Lever:
a) Meet California code for 1/2 inch (12.7 mm) or less return to door.
b) Vandal-Resistant Lever.
5) Deadlocking Latchbolt.
b. Grade 2 Standard Duty Key-In Lever Cylindrical Lockset:
1) ANSI/BHMA A156.02 Series 4000 Grade 2.
2) Meet UL 3 hour fire rating.
3) Meet ADA Compliant ANSI A117.1 Accessibility Code.
4) Door Lever:
a) Meet California code for 1/2 inch (12.7 mm) or less return to door.
2. Lever Operated:
a. Category Four Approved Products. See Section 01 6200 for definitions of Categories:
1) Grade 2 Standard Duty Key-In Lever Cylindrical Locksets:
a) 7K Series Best Lock with 15D Lever by Stanley standard cylinders - (I/C cores may be used when authorized by AEC).
b) 175 Series with American Lever by Marks USA.
c) 7 Line Series with L Lever by Sargent.
d) AL Series with Saturn (SAT) Lever by Schlage.
e) 5300LN Series with Augusta (AU) Lever by Yale.
3. Knob Operated:

a. Category Four Approved Products. See Section 01 6200 for definitions of Categories:
   1) 6 Line Series by Sargent.
   2) A Series by Schlage.

E. Deadbolts:
   1. Category Four Approved Products. See Section 01 6200 for definitions of Categories:
      a. Match manufacturer of locksets.

F. Standard Cylinders:
   1. Category Four Approved Products. See Section 01 6200 for definitions of Categories:
      a. Match Manufacturer of locksets.
   2. Category Four Approved Products. See Section 01 6200 for definitions of Categories.
      a. Match Manufacturer of locksets.
   3. Category Four Approved Products. See Section 01 6200 for definitions of Categories:
      a. Apex Series by Precision.
      b. 80 Series by Sargent.
      c. 99 or 98 Series by Von Duprin.
      d. 7100 Series by Yale.

PART 3 - EXECUTION

3.1 CLOSE-OUT ACTIVITIES

A. Owner's Instructions:
   1. Before Final Acceptance Meeting, send master keys to Orem Central FM Group "Lynn Adams".

END OF SECTION

SECTION 08 7108

STOPS AND HOLDERS

PART 1 - GENERAL

1.1 SUMMARY

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

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

PART 2 - PRODUCTS

2.1 MANUFACTURED UNITS

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

B. Stops:
   1. Use wall type stops unless indicated otherwise on Door Schedule.
   2. Provide model appropriate for substrate. Wall stops may be either cast or wrought.
   3. Type Two Acceptable Products:

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

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

PART 3 - EXECUTION

3.1 INSTALLATION

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

END OF SECTION

SECTION 08 7109

ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

A. Products Furnished But Not Installed Under This Section:
   1. Acoustical seals.
   2. Door Silencers.
   3. Smoke Gaskets.
   4. Thresholds (metal) where required for wood doors and hollow metal doors.

B. Related Requirements:
   1. Section 08 7101: 'Common Finish Hardware Requirements' for general finish hardware requirements and Approved Suppliers.

1.2 REFERENCES

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

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

PART 2 - PRODUCTS

2.1 MANUFACTURED UNITS

A. Manufacturers:
   1. Manufacturer Contact List:
      a. Hager, St Louis, MO www.hagerhinge.com.
      b. Ives, Wallingford, CT www.iveshardware.com.
      c. NGP - National Guard Products, Memphis, TN www.ngpinc.com.
      d. Pemko Manufacturing, Ventura, CA www.pemko.com.

B. Acoustical Seals:
   1. Color as selected by Architect.
   2. Type One Acceptable Products:
      a. Door Bottom Shoe for Wood Door:
         1) 13VDkB by NGP.
         2) 211DV by Pemko.
      b. Door Bottom Shoe for Metal Door:

1) 779S-A by Hager.
2) 35EV by NGP.
3) 217AV by Pemko.

c. Equal as approved by Architect before bidding. See Section 01 6200.

C. Door Silencers:
1. Class Two Quality Standards:
a. For Metal Frames:
1) 307D by Hager.
2) SR64 by Ives.

D. Smoke Gaskets:
1. Color as selected by Architect.
2. Type One Acceptable Products:
a. 726 by Hager.
b. 5050 by NGP.
c. PK55 by Pemko.
d. Equal as approved by Architect before bidding. See Section 01 6200.

PART 3 - EXECUTION

3.1 INSTALLATION

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

END OF SECTION

SECTION 08 8100

GLASS GLAZING

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Quality of glazing used in entries, doors, and windows.

B. Related Requirements:
   1. Sections Under 08 1000 Heading: Furnishing and installing of flush wood door lites in new doors.
   2. Section 08 4113: Furnishing and installing of glazing in aluminum-framed storefront.

1.2 REFERENCES

A. Association Publications:
   1. Glass Association of North America (GANA):
      a. *'Glazing Manual'*.
      b. '*Laminated Glass Design Guide'*.
      c. *'Engineering Standards Manual'*.
   2. The Insulating Glass Manufactures Alliance (IGMA):
      a. IGMA TB-3001 'Sloped Glazing Guidelines.
      b. SIGMA TM-3000 'Glazing Guidelines for Sealed Insulating Glass Units'.

B. Definitions:
   1. Airspace: Space between lites of insulating glass unit that contains dehydrated air or other inert specified gas.
   2. Emissivity: Ability of surface to absorb heat and to reflect it. Lower emissivity, the less room heat is absorbed and more heat is reflected back into the room.
   3. Glass Surface:
      a. Monolithic glass:
         1) Surface 1: Exterior surface.
         2) Surface 2: Interior surface.
   4. Insulation Glass: Two pieces of glass spaced apart and hermetically sealed to form single-glazed unit with air space between. Heat transmission through this type of glass may be as low as half that without air space. Also called double glazing, double pane, insulated unit, and thermal pane.
   5. Laminated Glass: Two or more sheets with inner layer of transparent plastic to which glass adheres if broken. Used for overhead, safety glazing, and sound reduction.
   6. Low-Emissivity Glass (Low-E): Reduces wintertime heat loss from interior with thin, almost colorless metallic coating that reflects heat back inside structure. Allows moderate solar heat gain while reducing harmful ultraviolet light in any season. Minimizes summertime air conditioning loss by reflecting radiated heat to outside. May be tempered for where safety glass is required. Available in single strength clear, gray and bronze (brown) color.
   7. Shading Coefficient: Ratio of solar heat gain passing through a glazing system to solar heat gain that occurs under the same conditions if the window was made of clear, unshaded double strength glass. Lower SC number, the better solar control efficiency of glazing system.
   8. Solar Absorptance: Percent of incident solar radiation that is absorbed by window film/glass system. Lower the number, the less solar radiation absorbed.
   9. Solar Heat Gain Coefficient (SHGC): Ratio of total solar heat passing through a given window relative to the solar heat incident on the projected window surface at normal solar incidence. (Percentage of solar energy directly transmitted or absorbed and re-radiated into a building). Lower SHGC, the better it is able to reduce heat.

10. Solar Reflectance (R): Percent of incident solar radiation that is reflected by window film/glass system. Lower the number, the less solar radiation reflected.
11. Solar Transmittance (T): Percent of incident solar radiation that is transmitted through window film/glass system. Lower the number, the less solar radiation transmitted.
12. Tempered Glass: Glass strengthened through process of heating, creating tensile strength that causes glass to resist breakage, yet disintegrate into small pieces if break occurs. Tempered glass is type of safety glass.
13. Tinted Glass: Special type glass with additives, usually metallic particles that reduce passage of sunlight. Tinted glass can be bronze, gray, green or blue as well as other more exotic colors.
14. U-Factor: Overall heat transfer coefficient of glazing system. Measure of heat transfer that occurs through glazing system, and its outer and inner surfaces. This value is a function of temperature, and is expressed in BTU per square foot per hour per degree Fahrenheit (BTU/sq ft/hr deg F). Lower the U-Factor, the better insulation qualities of glazing system.
15. U-Value: Measurement of heat transfer through film due to outdoor/indoor temperature differences. Lower U-value, less heat transfers. When using performance data, the lower U-value, better insulating qualities of window film/glass system.
16. Ultraviolet Transmittance: Percent of ultraviolet light (UV) that is transmitted by window film/glass system. Lower the number, the less ultraviolet transmitted.
17. Visible Light Transmitted (VLT): Percent of total visible light (380-780 nanometers) that passes through glass. Lower the number, the less visible light transmitted.

C. Reference Standards:
1. American Architectural Manufacturers Association / Window & Door Manufacturers Association / Canadian Standards Association:
   a. AAMA 800-10, ‘Voluntary Specifications and Test Methods for Sealants’.
2. American National Standards Institute:
   a. ANSI Z97.1-2009, 'Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test’.
3. ASTM International:
   a. ASTM C1036-11, ‘Standard Specification for Flat Glass’.
   b. ASTM C1048-12, 'Standard Specification for Heat-Treated Flat Glass - Kind H, Kind FT Coated and Uncoated Glass’.
   c. ASTM C1172-14, ‘Standard Specification for Laminated Architectural Flat Glass’.
   d. ASTM C1281-14, ‘Standard Specification for Preformed Tape Sealants for Glazing Applications’.
   e. ASTM E2190-10, ‘Standard Specification for Insulating Glass Unit Performance and Evaluation’.
4. Consumer Products Safety Commission (CPSC):
   a. 16 CFR, Part 1201 CAT 1 and 11, 'Safety Standard for Architectural Glazing Materials'.
5. National Fenestration Rating Council (NFRC):
   a. NFRC 100-2014, ''Procedure for Determining Fenestration Product U Properties'.
   b. NFRC 200-2014, 'Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence'.
   c. NFRC 300-2014, 'Test Method for Determining Solar Optical Properties of Glazing Materials and Systems'.

1.3 SUBMITTALS

A. Action Submittals:
1. Product Data:
   a. Manufacturer’s data sheets for each glass product and glazing material.

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

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

a. Warranty Documentation:
   1) Final, executed copy of Warranty.

1.4 QUALITY ASSURANCE

A. Regulatory Agency Sustainability Approvals:
   1. Glazing shall meet applicable requirements of Federal Consumer Product Safety Standard 16 CFR 1201.
   2. Comply with published recommendations of glass product Manufacturers and organizations, except where more stringent requirements are indicated.

B. Qualifications:
   1. Installer: Requirements of Section 01 4301 applies, but not limited to following:
      a. Satisfactorily completed at least three (3) installations of similar size, scope, and complexity in each of past two (2) years and be approved by glass product Manufacturer before bidding.
      b. Upon request, submit documentation.

C. Certifications:
   1. Labels showing strength, grade, thickness, type, and quality are required on each piece of glass.
   2. Manufacturers/Fabricators certifying products furnished comply with project requirements.
   3. Insulating-Glass Certification Program: Indicate compliance with requirements of Insulating Glass Certification Council on applicable glazing products.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Delivery And Acceptance Requirements:
   1. Follow Manufacturer’s instruction for receiving, handling, and protecting glass & glazing materials to prevent breakage scratching, damage to seals, or other visible damage.
   2. Deliver materials in manufacturer’s original, unopened, undamaged containers with identification labels intact.

B. Storage And Handling Requirements:
   1. Follow Manufacturer’s instruction for storing and protecting glass & glazing materials.
   2. Store materials protected from exposure to harmful environmental conditions and at temperatures and humidity conditions recommended by Manufacturer.
   3. Protect edge damage to glass, and damage/deterioration to coating on glass.

1.6 FIELD CONDITIONS

A. Ambient Conditions:
   1. Do not proceed with glazing when ambient and substrate temperature conditions are outside the limits permitted by glazing material manufacturer or when joint substrates are wet due to rain, frost, condensation or other causes.

1.7 WARRANTY

A. Manufacturer Warranty:
   1. Insulating Glass Warranty:
      a. Manufacturer’s standard form, signed by insulating-glass product Manufacturer/Fabricator, agreeing to replace insulating-glass units that exhibit failure of hermetic seal under normal use evidenced by obstruction of vision by dust, moisture, or film on interior surfaces of glass, for ten [10] years of date of installation.
   2. Installer’s Warranty:

a. Form acceptable to Owner, signed by glass product Installer, agreeing to replace glass products that deteriorate, or that exhibit damage or deterioration of glass or glazing products due to faulty installation, for two (2) years from date of installation.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Manufacturers:
1. Manufacturer Contact List for Low E Glazing:
   a. AGC Flat glass North America, Kingsport, TN www.us.agc.com.
   b. Carlex (subsidiary of Central Glass Co., Ltd., Nashville, TN www.carlex.com.
   c. Guardian Industries Corp., Auburn Hills, MI www.guardian.com.
   d. Oldcastle BuildingEnvelope, Santa Monica, CA www.oldcastlebe.com.
   e. Pilkington North America Inc., Toledo, OH www.pilkington.com.
   f. PPG Industries, Pittsburgh, PA www.ppgglass.com or PPG Canada Ltd, Glass Division, Toronto, ON (416) 789-3331.

B. Fabrication:
1. Except where glass exceeds 66 inches (1 675 mm) in width, cut clear glass so any wave will run horizontally when glazed.
2. Sealed, Insulating Glazing Units:
   a. Double pane, sealed insulating glass units. Install at exterior windows and exterior aluminum-framed storefront.
   b. Unit Thickness: 5/8 inch (16 mm) minimum, one inch (25 mm) maximum.
   c. Type Seal:
      1) Metal-to-glass bond and separated by 1/2 inch (12.7 mm) dehydrated air space.
      2) Use non-hardening sealants.
   d. Category Four Approved Fabricators. See Section 01 6200 for definitions of Categories.
      1) Members of Sealed Insulating Glass Manufacturer's Association.

2.2 ACCESSORIES

A. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.

B. Glazing Tape: Butyl-based elastomeric tape with integral resilient tube spacer, 10 to 15 Shore A durometer hardness, black color, coiled on release paper; widths required for specified installation, complying with ASTM C1281 and AAMA 800 for application.

PART 3 - EXECUTION: Not Used

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 9413: 'Interior Textured Finishing'.

1.2 REFERENCES

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

B. Reference Standards:
   1. ASTM International:
      a. ASTM C11-15, '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 (10 deg C) and 95 deg F (35 deg C) maximum day and night during entire joint operation and until execution of Certificate of Substantial Completion.
         2) Provide ventilation to eliminate excessive moisture.
         3) Avoid hot air drafts that will cause too rapid drying.
      b. Do not install panels that are wet, those that are moisture damaged, and those that are mold damaged.

PART 2 - PRODUCTS

2.1 MATERIALS

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

B. Materials:
   1. Interior Gypsum Board:
      a. General:
         1) Size:

a) Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

2) Class Two Quality Standard:
   a) Core: Fire-resistant rated gypsum core.
   b) Complies with Type X requirements of ASTM C1396/C1396M (Section 5).
   c) Surface paper: Face paper suitable for painting.
   d) Long edges: Tapered edge.
   e) Overall thickness: 5/8 inch (15.9 mm).

2.2 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. Gypsum Board Mounting Accessories:
      a. Corner And Edge Trim:
         1) Metal, paper-faced metal, paper-faced plastic, or solid vinyl meeting requirements of ASTM C1047. Surfaces to receive bedding cement treated for maximum bonding.
   3. 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.
   4. Joint Reinforcing:
      a. Paper reinforcing tape acceptable to Gypsum Board Manufacturer.
   5. Fasteners:
      a. Bugle head screws meeting requirements of ASTM C1002:
         1) Gypsum Board:
            a) Type W: For fastening gypsum board to wood members, of length to penetrate wood framing 5/8 inch (15.9 mm) minimum.
         2) Glass Mat Gypsum Tile Backer:
            a) Wood Framing: 11 ga (0.1233 in) (3.1318 mm), galvanized with 7/16 inch (11 mm) head, hot dipped. Screws: Type W or Type S Hi-Lo, bugle head, rust resistant.

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

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification Of Conditions:
   1. Examine substrate and verify framing is suitable for installation of gypsum board.

2. Examine gypsum board before installation. Reject panels that are wet, moisture damaged, and mold damaged.
3. Notify Architect of unsuitable conditions in writing.
   a. Do not install board over unsuitable conditions.
4. Commencement of Work by installer is considered acceptance of substrate.

3.2 INSTALLATION

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

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

C. Interior Gypsum Board:
   1. General:
      a. Install so trim and reinforcing tape are fully backed by gypsum board. No hollow spaces between pieces of gypsum board over 1/8 inch (3 mm) wide before taping are acceptable.
      b. Rout out backside of gypsum board to accommodate items that extend beyond face of framing, but do not penetrate face of gypsum board, such as metal door frame mounting brackets, etc.
      c. On walls over 108 inches (2 700 mm) high, apply board perpendicular to support
      d. Butt edges in moderate contact. Do not force in place. Shim to level.
      e. Leave facings true with joint, finishing flush. Vertical work shall be plumb and ceiling surfaces level.
      f. Scribe work closely:
         1) Keep joints as far from openings as possible.
         2) If joints occur near an opening, apply board so vertical joints are centered over openings.
         3) No vertical joints shall occur within 8 inches (200 mm) of external corners or openings.
      g. Install board tight against support with joints even and true. Tighten loose screws.
      h. Caulk perimeter joints in sound insulated rooms with specified acoustical sealant.
   2. Ceilings:
      a. Apply ceilings first using minimum of two (2) men.
      b. Use board of length to give minimum number of joints.
      c. Apply board perpendicular to support.
   3. Fastening:
      a. Apply from center of board towards ends and edges.
      b. Apply screws 3/8 inch (9.5 mm) minimum from ends and edges, one inch (25 mm) maximum from edges, and 1/2 inch (13 mm) maximum from ends.
      c. Spacing:
         1) Ends: Screws not over 7 inches (175 mm) on center at edges where blocking or framing occurs.
         2) Wood Framed Walls And Ceilings: Screws 7 inches (175 mm) on center in panel field.
         3) Metal Framed Walls: Screws 12 inches (300 mm) on center in panel field.
      d. Set screw heads 1/32 inch (0.8 mm) below plane of board, but do not break face paper. If face is accidentally broken, apply additional screw 2 inches (50 mm) away.
      e. Screws on adjacent ends or edges shall be opposite each other.
      f. Drive screws with shank perpendicular to face of board.
   4. Trim:
      a. Corner Beads:
         1) Attach corner beads to outside corners.
            a) Attach metal corner bead with staples spaced 4 inches (100 mm) on center maximum and flat taped over edges of corner bead. Also, apply screw through edge of corner bead where wood trim will overlay corner bead.

b) Set paper-faced trim in solid bed of taping compound.

b. Edge Trim: Apply where gypsum board abuts dissimilar material. Hold channel and 'L' trim back from exterior window and door frames 1/8 inch (3 mm) to allow for caulking.

5. Finishing:

a. General:

1) Tape and finish joints and corners throughout building as specified below to correspond with final finish material to be applied to gypsum board. When sanding, do not raise nap of gypsum board face paper or paper-faced trim.

2) First Coat:

a) Apply tape over center of joint in complete, uniform bed of specified taping compound and wipe with a joint knife leaving a thin coating of joint compound. If metal corner bead is used, apply reinforcing tape over flange of metal corner bead and trim so half of tape width is on flange and half is on gypsum board.

b) Completely fill gouges, dents, and fastener dimples.

c) Allow to dry and sand lightly if necessary to eliminate high spots or excessive compound.

3) Second Coat:

a) Apply coat of specified joint compound over embedded tape extending 3-1/2 inches (88 mm) on both sides of joint center. Use finishing compound only if applied coat is intended as final coat.

b) Re-coat gouges, dents, and fastener dimples.

c) Allow to dry and sand lightly to eliminate high spots or excessive compound.

4) Third Coat: Apply same as second coat except extend application 6 inches (150 mm) on both sides of joint center. Allow to dry and sand with fine sandpaper or wipe with damp sponge.

5) Fourth Coat: Apply same as second coat except extend application 9 inches (425 mm) on both sides of joint center. Allow to dry and sand with fine sandpaper or wipe with damp sponge.

a. Finishing Levels: Finish panels to levels indicated below and according to ASTM C840, GA-214 and GA-216:

1) Gypsum Board Surfaces to Receive: 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'.

2) 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'.

3) 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'.

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 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 (305 mm x 305 mm) 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 (3 mm) to 1/4 inch (6.4 mm) 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 (305 mm x 305 mm), 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. (AASHRA):
   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 SUBMITTALS

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

B. Informational Submittals:
1. Certificates:
   a. Installer(s):
      1) Provide each Installer's 'Certificate of Completion - LDS Duratile' from Manufacture showing Name and completion date with bid to be included in closing documents for project.
         a) Certificate is valid for two (2) years from date printed on Certificate before recertification is required.

2. Test And Evaluation Reports:
   a. If requested by Owner, provide copies of Quality Assurance requirements for ‘Class A’ flame spread rating and 'Room-Corner Test'.
3. Manufacturer Installations:
   a. Published installation recommendations.
4. Qualification Statement:
   a. Installer(s):
      1) Provide Qualification documentation unless waived by Owner.

C. Closeout Submittals:
1. Include following in Operations And Maintenance Manual specified in Section 01 7800:
   a. Warranty Documentation:
      1) Include final, executed copy of warranty.
   b. Record Documentation:
      1) Manufacturers Documentation:
         a) Manufacturer's literature on tile and adhesive.
         b) Color and pattern selection.
      2) Installer(s) ‘Certificate of Completion - LDS Duratile’ submitted at time of bid.

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

1.4 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) IBC 803.2.1, ‘Room Corner Test for Interior Wall or Ceiling Finish Materials’.
      3) NFPA 265: ‘Room Corner Test for Interior Wall or Ceiling Finish Materials’.
      4) 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.

1.5 DELIVERY, STORAGE, AND HANDLING

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

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

1.6 FIELD CONDITIONS

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

1.7 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:
a. Size: 3/4 inch (19 mm) thick minimum by 12 inches (300 mm) square.
b. Color: White.
c. Grid Face: Tile glue-up.
d. Surface Finish: Factory-applied.
e. Wet-formed high density mineral fiber.
2. Design Criteria:
a. Meet requirements of ASTM E1264, Type III (mineral base with painted finish), Form 2 (water felted), Pattern CE (perforated, small holes – lightly textured), Fire Class A.
b. Acoustics:
1) Noise Reduction Coefficient (Rating expressed according to ASTM E1284 requirements:
a) NRC rating: 60 minimum.
2) CAC rating: 35 minimum.
c. Anti Mold / Mildew:
1) Resistance against growth of mold/mildew.
d. Durable:
1) Impact-resistant.
2) Scratch-resistant.
e. Tongue and Groove.
f. Finish:
1) Abuse-resistant/durable, factory applied vinyl latex paint.
g. Fire Performance:
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. Materials:
1. Description:
a. Size: 3/4 inch (19 mm) thick minimum by 12 inches (305 mm) square.
b. Color: White.
c. Grid Face: Tile glue-up.
d. Surface Finish: Factory-applied.
e. Wet-formed high density mineral fiber.
2. Design Criteria:
a. Armstrong:
1) 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.

2) Meet requirements of ASTM E1264, Type III (mineral base with painted finish), Form 1 (nodular), Pattern E (lightly textured) or Pattern F (heavily textured), Fire Class A.

b. USG:
1) Meet requirements of ASTM E1264, Type III (mineral base with painted finish), Form 4 (cast or molded), Pattern D (Fissured), Fire Class A.

c. Acoustics:
1) Noise Reduction Coefficient (Rating expressed according to ASTM E1284 requirements:
a) NRC rating: 60 minimum.
2) CAC rating:
a) Armstrong: 35 minimum.
b) USG: 25 minimum.

d. Anti Mold / Mildew:
1) Resistance against growth of mold/mildew.

e. Durable:
1) Impact-resistant.
2) Scratch-resistant.

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): 0.79 minimum.

j. VOC Requirements:
1) Armstrong:
a) Low formaldehyde: Contributing less than 13.5 ppb in typical conditions per ASHRAE Standard 62, 'Ventilation for Acceptable Indoor Air Quality'.
2) USG:
a) Zero.

3. Acoustic Tile:
a. Category Four Approved Product. See Section 01 6200 for definitions of Categories.
1) 'F' Fissured by USG.

D. Accessories:
1. Adhesive:
a. Description:
1) For use on acoustical ceiling tiles.

b. Design Criteria:
1) Meet requirements of ASTM D1779.
2) Meet NFPA Class A fire rating when tested in accordance with ASTM E84.
3) Fast grab and 'no sag' installation.
4) Water cleanup.
5) Not recommended for use on tiles larger than 12 inch x 12 inch (305 mm x 305 mm).

c. Type Two Acceptable Products:
1) Titebond No. 2704 Solvent Free Acoustical Ceiling Tile Adhesive by Franklin International.
2) Highest quality of adhesive from manufacturer recommended by Tile Manufacturer as approved by Architect before use. See Section 01 6200.

2. Edge Molding:
a. Steel 'U' molding with baked enamel finish.

b. Type Two Acceptable Products:
1) US 12 RWS 14 by USG Interiors.
2) Equal as approved by Architect before installation. See Section 01 6200.

PART 3 - EXECUTION

3.1 EXAMINATION

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

3.2 PREPARATION

A. Surface Preparation:
   1. Follow Manufacturer recommendations for surface preparation:
      a. Substrate must be clean, free of grease and dirt, sound, smooth, even and level before applying tile to surface.
         1) Do not install new ceiling tile over old glue globs or bad substrate with any surface finish that is incompatible with tile adhesive.
      b. Painted Surfaces: Avoid applying tile to newly painted ceiling.
      c. Materials shall be dry and clean at time of application.

3.3 INSTALLATION

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

3.4 FIELD QUALITY CONTROL

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

3.5 ADJUSTING

A. 'Touch-up' minor abraded surfaces.

3.6 CLEANING

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

END OF SECTION

SECTION 09 6816

SHEET CARPETING: Back Cushion, Direct Glue

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes But Is Not Limited To:
1. Coordination, sequencing, and scheduling for installation of Owner-Furnished carpet, carpet base, carpet accessories, leveling compounds as described in Contract Documents and including following:
   a. Maintain Building Ambient Conditions including normal levels of humidity, lighting, heating, and air conditioning for acceptability for beginning floor preparation and carpet installation held.
   b. Provide disposal dumpster.
   c. Protection of carpet after installation of carpeting as required.

B. Related Requirements:
1. Section 01 0000: 'General Requirements':
   a. Section 01 1200: 'Multiple Contract Summary' for carpet tiles and carpet base excluded from Contract and furnished and installed by Owner. This Section establishes quality of materials and installation for information of Contractor and Owner's Representatives.
   b. Section 01 3100: 'Project Management and Coordination' for pre-installation conference.
   c. Section 01 4000: 'Quality Requirements' for administrative and procedural requirements for quality assurance and quality control.
   d. Section 01 4301: 'Quality Assurance – Qualifications' establishes minimum qualification levels required.
   e. Section 01 7800: 'Closeout Submittals'.

1.2 REFERENCES

A. Association Publications:
1. American Concrete Institute, Farmington Hills, MI www.concrete.org. Abstracts of ACI Periodicals and Publications.
   a. ACI 302.2R-06, *Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials* (August 15, 2006).
2. NSF International:
   a. NSF International, Ann Arbor, MI www.nsf.org.
      1) NSF 140-2015, 'Sustainability Assessment for Carpet'.
3. The Carpet and Rug Institute (CRI), Dalton, GA www.carpet-rug.org. Standard for Installation Specification of Commercial Carpet:
   a. CRI Carpet Installation Standard – 2011 (First Edition).
   b. CRI Indoor Air Quality (IAQ):
      1) CRI Green Label Plus Certification.

B. Definitions:
1. Adhesive: Substance that dries to film capable of holding materials together by surface attachment.
2. Antimicrobial: Chemical treatment added to carpet or reduce growth of common bacteria, fungi, yeast, mold and mildew.
3. Appearance Retention: Ability of a fabric to retain its original aesthetics, color, and construction integrity.
4. Backing: Materials comprising back of carpet as opposed to carpet pile or face.

a. Tufted carpets: (1) Primary backing, woven or nonwoven fabric in which pile yarn is inserted by tufting needles. (2) Secondary backing, Fabric laminated to back of carpet to reinforce and increase dimensional stability.
b. Woven carpets: Backings are 'construction yarns' comprising chain warp, stuffer warp, and shot or fill, which are interwoven with face yarn during carpet fabric formation.

5. Bonding Agent (Backcoating): Application of latex or adhesive to back of carpet to anchor tufts usually followed immediately by addition of secondary backing material such as nonwoven polypropylene or poly-urethane attached cushion.
6. Carpet: Heavy fabric used to cover floor and made from variety of fibers.
7. Change In Surface Appearance: Cumulative change in surface appearance between unexposed and exposed specimens due to crushing, loss of tuft definition, and matting.
8. Colorfastness: Ability of fiber or carpet to retain color when exposed to (1) ultraviolet light, (2) crocking (wet or dry) and (3) atmospheric conditions.
9. Commercial Match: Matching of colors with acceptable tolerance, or with color variation that is barely detectable to naked eye.
10. Crockfastness: Resistance of transfer of colorant from surface of colored yarn or fabric to another surface, or to an adjacent area of same fabric, principally by rubbing.
11. Crushing: Collapsing of pile yarns, resulting in carpet matting and loss of resilience due to traffic.
12. Delamination: Form of deterioration of tufted carpet in which primary back and face yarns separate from secondary back.
13. Density: Amount of pile yarn per area of carpet or closeness of tufts. Higher density carpet improves resistance to crushing and matting.
14. Dimensional Stability: Ability of carpet to retain its size and shape once installed.
15. Face Weight: Total weight of face (above backing) yarns in carpet.
16. Fiber: Fundamental unit of carpet made from nylon, polyester, cotton, acrylics, wool, and recycled material.
17. Flammability: Procedures that have been developed for assessing flame resistance of carpets.
18. Foot Traffic Classification: Process that classifies areas of intended use and minimum carpeting texture appearance for particular areas of use established for each application based on level of expected foot traffic in specific areas. Classifications are Moderate, Heavy and Severe.
19. Fuzzing: Fluffy particles appear on carpet surfaces caused by fibers that loosen because of weak twist or snags.
20. Lightfastness: Degree of resistance of dyed textile materials to color destroying influence of sunlight.
21. Loss of Tuft Definition: Bursting, opening, and untwisting of pile yarn and/or decrimping of fibers in surface pile of pile yarn floor covering.
22. Matting: Loss of pile definition of a textile floor covering due to entanglement and compression of pile fibers.
23. Modification Ratio: Ratio between circumference of inner core of multi lobal fiber's cross section, and circumference of circle drawn around outer edges of fibers cross sections' outer lobes or tips.
24. Pile: Visible surface of carpet, consisting of yarn tufts in loop and/or cut configuration. Sometimes called face or nap.
25. Relative Humidity (RH) Testing: Testing of concrete slabs is defined as ratio of actual amount of water vapor present in volume of air at given temperature to maximum amount that air could hold at that temperature, expressed as percentage.
    a. Relative Humidity test method covers quantitative determination of percent relative humidity in concrete slabs for field or laboratory tests.
    b. Moisture test results indicate moisture condition of slab only at time of test.
26. Resilience: Ability of carpet to spring back to its original texture and thickness after being walked on or compressed weight of furniture.
27. Soil Resistance: Ability of carpet fiber to resist dry soil and maintain its original appearance after intermittent or restorative cleanings.
28. Soiling: Occurs when dirt particles build up in carpet fibers.
29. Stain Resistance: Ability of carpet fiber to resist absorption of stain and maintain its original appearance.
30. Texture: Visual and tactile surface characteristics of carpet pile, including such aesthetic and structural elements.
31. Tile: Carpet module usually 18 inch x 18 inch or 24 inch x 24 inch (450 mm x 450 mm or 600 mm x 600 mm) in size. Extremely dense construction with heavy reinforced backing.

32. Tuft: Cluster of yarns drawn through fabric and projecting from surface in form of cut yarns or loops.
33. Tuft Bind: Force (usually measured in pounds) required to pull tuft from carpet backing.
34. Tufted Carpet: Carpet produced by tufting machine instead of loam.
35. Twist: Winding of yarn around itself. More twist improves carpet performance (especially in cut pile).
36. Woven Carpet: Carpet produced on a loom through weaving process by which lengthwise (warp) yarns and widthwise (weft or filling) yarns are interlaced to form fabric.
37. Woven: Interlacing strands of fiber into yarn forms woven carpet.
38. Yarn: Fibers that are twisted together to form a continuous strand.

C. Reference Standards:
1. American Association of Textile Chemists and Colorists (AATCC):
   a. Test Method:
      1) AATCC 16.3-2014, 'Colorfastness to Light: Xenon-Arc'.
      2) AATCC 107-2013, 'Colorfastness to Water'.
      3) AATCC 134-2011, 'Electrostatic Propensity of Carpets'.
      4) AATCC 165- 2013, 'Colorfastness to Crocking: Textile Floor Coverings--Crockmeter Method'.
      5) AATCC 174-2011, 'Antimicrobial Activity Assessment of Carpets'.
      6) AATCC 175-2013, 'Stain Resistance: Pile Floor Coverings'.
2. ASTM International:
   a. ASTM D1335-12, 'Standard Test Method for Tuft Bind of Pile Yarn Floor Coverings'.
   b. ASTM D2646-11, 'Standard Test Methods for Backing Fabric Characteristics of Pile Yarn Floor Coverings'.
   c. ASTM D3676-13, 'Standard Specification for Rubber Cellular Cushion Used for Carpet or Rug Underlay'.
   d. ASTM D3936-12, 'Standard Test Method for Resistance to Delamination of the Secondary Backing of Pile Yarn Floor Covering'.
   e. ASTM D5116-10, 'Standard Guide for Small-Scale Environmental Chamber Determinations of Organic Emissions From Indoor Materials/Products'.
   f. ASTM D5252-15, 'Standard Practice for the Operation of the Hexapod Drum Tester'.
   g. ASTM D5848-10e1, 'Standard Test Method for Mass Per Unit Area of Pile Yarn Floor Coverings'.
   h. ASTM D6962-12, 'Standard Practice for Operation of a Roller Chair Tester for Pile Yarn Floor Coverings'.
   i. ASTM D7330-15, 'Standard Test Method for Assessment of Surface Appearance Change in Pile Floor Coverings Using Standard Reference Scales'.
   j. ASTM E648-15, 'Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source'.
   k. ASTM E662-15a, 'Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials'.
3. British Spill Test:
   a. Test with protocol but not standardized test (Developed several years ago by West End Medical Association in Great Britain and since has been adopted by several U.S. Manufactures).
4. International Organization for Standardization (ISO).
   a. ISO 2551:1981, 'Machine-made textile floor coverings - Determination of dimensional changes due to the effects of varied water and heat conditions'.
5. National Fire Protection Association (NFPA):
   a. NFPA (Fire) 253, 'Standard Method of Test for Critical Radiant Flux of Floor Covering Systems using a Radiant Heat Energy Source' (2015 Edition).
6. The Carpet and Rug Institute (CRI):
   a. CRI 104, 'Standard For Installation of Commercial Carpet' (Sept 2015).
   b. CRI TM-101, 'Assessment of Carpet Surface Appearance Change using the CRI Reference Scales'.
   c. CRI TM-102, 'School Carpet Minimum Average Specifications'.

1.3 ADMINISTRATIVE REQUIREMENTS

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

B. Scheduling:
1. Owner's Representative to notify Flooring Installer when Building Ambient Conditions requirements are met before installation of flooring system.
2. Owner's Representative to coordinate installation of carpet.

1.4 SUBMITTALS

A. Informational
1. Manufacturer Instructions:
a. Published installation instructions.

B. Closeout Submittals:
1. Include following in Operations And Maintenance Manual specified in Section 01 7800:
a. Warranty Documentation:
1) Copy of Warranty.
b. Record Documentation:
1) Owner will provide Project Carpet Request Documentation forms in both hard copy and digital format:
a) Carpet Request Information Sheet.
b) Carpet Vendor Quotation.
c) Carpet Installation Notice to Proceed or Cancel.
d) Carpet Inspection and Completion.
e) Carpet Overage Report and Completion.
f) Carpet Quotation Change Request.
2) Owner to provide Testing Agency Testing Report of Alkalinity and Concrete Moisture testing for project.

C. Maintenance Material Submittals:
1. Extra Stock Materials:
a. Leave excess pieces of carpet, 6 feet square (1 800 sq mm) or larger, and 25 lineal feet (7.62 m) minimum of carpet cove base.
b. Roll up and tie securely.

1.5 QUALITY ASSURANCE

A. Regulatory Agency Sustainability Approvals:
1. All products provided will meet requirements of all federal, state, and local codes having jurisdiction.
2. Label meeting Federal Labeling Requirements, as stated in Textile Products Identification Act under Federal Trade Commission, shall be attached to certification samples and products delivered.

B. Qualifications: Section 01 4301 applies, but is not limited to following:
1. Carpet Installer Qualifications:
a. Certified CFI Master or Contract II grade installer or FCIB certified.
b. Not less than five (5) years of experience in installation of commercial carpet tile of type, quantity and installation methods similar to work of this section.
c. Qualified and approved by Carpet Manufacturer.
2. Carpet Manufacturer Qualifications:
a. Not less than five (5) years of production experience, whose published literature clearly indicates general compliance of products with requirements of this section.
b. VMR Approved Carpet Manufacturers:

1) Approval subject to VMR agreement process approval.

1.6 DELIVERY, STORAGE, AND HANDLING

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

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

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

1.7 FIELD CONDITIONS

A. Ambient Conditions:
1. Building Conditions:
a. Conditions inside building shall be brought to levels to be normal at occupancy of building. Conditions include normal levels of humidity, lighting, heating, and air conditioning. (HVAC must be in operation thru out carpet installation):
1) Carpet installation is not to begin until HVAC system is operational and following conditions are maintained for at least forty eight (48) hours before, during and seventy two (72) hours after completion:
a) Carpet is to be installed when indoor temperature is between 65º - 95º F (18º - 35º C) with maximum relative humidity of 65%.
b) Substrate surface temperature should not be less than 65º F (18º C) at time of installation.
c) Do not allow temperature of indoor carpeted areas to fall below 50º F (10º C), regardless of age of installation.
2) Maintain fresh air ventilation after installation for seventy two (72) hours minimum or until lingering odors are gone.
2. Concrete Slab:
a. General:
1) Do not install carpet over concrete slabs until slabs have cured and are sufficiently dry to bond with adhesive and concrete slabs have Alkalinity range and Concrete Moisture Vapor Emission Rate (MVER) as specified in Section 09 0503.02-FM ‘Floor Substrate Preparation’.
2) Final determination as to whether or not a concrete slab is dry enough for flooring installation should be based on evaluating both Alkalinity and Concrete Moisture Vapor Emission Rate (MVER) testing as specified in Section 09 0503.02-FM ‘Floor Substrate Preparation’.
b. Alkalinity:
1) Do not install sheet carpeting if alkalinity of concrete surface exceeds pH level 9. Corrective procedures are required.
c. Concrete Moisture Vapor Emission Rate (MVER):
1) Testing conditions inside building shall be brought to same ambient temperature and relative humidity levels to be normal at occupancy of building. Conditions include normal levels of humidity, lighting, heating, and air conditioning.

1.8 WARRANTY

A. Manufacturer Warranty:
1. Provide Carpet Manufacturer's standard Warranty which includes following:
a. Warranty shall cover defects in installation, workmanship, and installation materials.
b. Warranty includes specific workmanship warranties for delamination, edge raveling, fuzzing, pilling, and other textural changes which can be controlled through proper manufacturing (no fraying, zippering, delamination, edge raveling, fuzzing, pilling in carpet is acceptable for any reason).
c. Warranty terms will include inspection of defective area within fifteen (15) days of receipt of written notice from Owner and completion of corrective work within forty five (45) days, unless other arrangements are made in writing with Owner on case-by-case basis.
d. Carpet defect or installation defect:
1) Carpet Manufacturer may use any reasonable means to cure first three (3) breaches of warranty affecting an area of carpeting bounded by natural breaks such as doorways, stairs, rostrum and stage ('affected carpet area'). Such cure must preserve as uniform a blended appearance, acceptable to Carpet Manufacturer and Owner, as exists throughout Installation Site at time of breach.
2) If carpet defect or installation defect continues to appear after three (3) separate notices for correction from Owner, replace carpet where defects have occurred.
e. If Carpet Manufacturer follows installation requirements of Section 09 0503 ‘Floor Substrate Preparation’ Carpet Manufacture accepts liability of carpet installation for said given time as outlined in Special Warranty regardless of any climate or condition changes affecting RH levels of floor substrate.
2. Special Warranty:
a. Sheet Carpeting:
1) General:
a) Appearance Retention to be provided with Special Warranty requirements if not already included in Standard Warranty.
2) Meetinghouse, Mission Office, and O&M / R&I:
a) Owner Carpet Program Product: Provide twenty (20) year minimum or Carpet Manufacturer’s better Warranty on carpet system.
3) CES, S&I Module, and O&M / R&I:
a) Institute:
(1) Owner Carpet Program Product: Provide twenty-five (25) year minimum or Carpet Manufacturer’s better Warranty on carpet system.
b) Seminary:
(1) Owner Carpet Program Product: Provide twenty-five (25) year minimum or Carpet Manufacturer’s better Warranty on carpet system.

PART 2 - PRODUCTS

2.1 OWNER-FURNISHED PRODUCTS

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

B. Design Criteria:

1. General:
   a. Commercial Match:
      1) Colors, texture and pile of any product selected as carpet standard or custom designed specifically for Owner needs to be consistent in appearance.
      2) When new carpet is installed next to existing carpet, two pieces need to be within tolerance acceptable as commercial match (Two shade variations maximum).
      3) Regardless of reason, if commercial match is not achievable, existing carpet needs to be replaced to acceptable breaking point approved by Owner's Representative.
      4) If changes in supply chains or unforeseen circumstances require standard pattern to be re-engineered, new carpet must be made close to original as possible.
      5) New product must be approved by Owner.
   b. Compatibility:
      1) Materials supplied for carpet installation shall be complete package from specified Carpet Manufacturer. Do not mix items from material packages of different carpet Manufacturers.
      2) Provide carpet, seam sealers, adhesives, and other related materials that are compatible with one another and with substrates under conditions of service and application.
   c. Tested Products:
      1) New technology and products not allowed unless pre-approved by Owner.
2. Carpet Material Requirements:
   a. Carpet Backing:
      1) Broadloom - Attached Cushion.
         a) Manufacturer's preference that meets or exceeds specification and life cycle warranty expectation.
   b. Cushion Thickness:
      1) Attached cushion thickness shall be 0.10 inch minimum when tested in accordance with ASTM D3676.
   c. Fiber:
      1) Meetinghouse, Mission Office, and O&M / R&I:
         a) Antron Lumina and/or Legacy only.
      2) CES, S&I Module, and O&M / R&I:
         a) Institute:
            (1) Antron Lumina and/or Legacy only.
         b) Seminary:
            (1) Antron Lumina and/or Legacy only.
         c) Antron Lumina and/or Legacy only.
   d. Life Expectancy (Sheet Carpeting):
      1) Meetinghouse, Mission Office, and O&M / R&I: twenty (20) years minimum.
      2) CES, S&I Module, and O&M / R&I:
         a) Institute: fifteen (15) years minimum.
         b) Seminary: twenty (20) years minimum.
   e. Modification Ratio:
      1) Meetinghouse, Mission Office, and O&M / R&I: 1.5 or less.
      2) CES, S&I Module, and O&M / R&I:
         a) Institute: 1.5 or less.
         b) Seminary: 1.5 or less.
   f. Pile Yarn Floor Construction:
      1) Meet standard for average pile yarn weight tested under ASTM D5848.
         a) Carpet will retain eighty five (85) percent of these amounts at end of the warranty period.
3. Carpet Physical Performance:
   a. Appearance Retention Requirements:
      1) Foot Traffic Classification and Testing Requirements:
         a) Severe Traffic Criteria:
            (1) Carpet is to be tested in accordance to ASTM D5252 with an Actionbac secondary backing meeting short term cycles (4000) grading scale of 3.5 and long term cycles (12000) grading scale of 3.5 with appearance retention measured according.

(2) Carpet needs to be able to maintain 3.5 rating for eighty five (85) percent of its warranty expected life cycle in accordance to ASTM D7330.

2) Severe Traffic:
   a) Meetinghouse, Mission Office, and O&M / R&I.
   b) CES, S&I Module, and O&M / R&I.

b. British Spill Test:
   1) Carpet must past British Spill Test (formally known as the National Health Service Patient Area Requirement for the United Kingdom, Method E: Part 2):
      a) Test involves controlled spilling of blue dyed liquid from 1-meter (39 inches) height onto carpet product.
      b) Spill is allowed to stand for period of twenty four (24) hours, after which cuts are made through carpet in area of spill to establish whether there was penetration into or through carpet composite.

c. Colorfastness:
   1) Colorfastness to Crocking: AATCC 165:
      a) Color transfer Class 4 minimum, wet and dry, when tested as specified.
   2) Colorfastness to Light: AATCC 16.3:
      a) Not less than 4 after 40 AFU (AATCC fading units) Colorfastness to Light, Xenon-Arc (60 AFU) (AATCC Fading Unit).
   3) Colorfastness to Water: AATCC 107:
      a) Color transfer Class 4 minimum, AATCC Transference Scale (only yarn dyed carpets) (grade change in color and staining).

d. Compression Resistance and Compression Set Attached Cushion:
   1) Minimum CLD of 7 lb per cu in (0.194 kg per cu cm) at 25 percent deflection, and maximum compression set of 10 percent after 50 percent constant compression when tested in accordance with ASTM D3676 with modification to allow recovery at 158 deg F (70 deg C) instead of room temperature for thirty (30) minutes.

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

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

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

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

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

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

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

to meet the CRI IAQ Carpet Testing Program requirements and criteria as per ASTM D5116 CRI Test Program.

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

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

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

C. Materials:
1. Carpet (OM/RI Meetinghouse Projects with no pre-set color schemes).
   a. Carpet OPTION A (if required based on moisture testing specified in Section 09 0503):
      1) Category Four Approved Manufacturer and Color / Patterns. See Section 01 6200 for definitions of Categories:
         a) Lees/Mohawk:
            (1) Nauvoo II: 407 Columbine II.
            (2) Nauvoo II: 121 Forest II.
            (3) Nauvoo II: 405 Bountiful II.
            (4) Nauvoo II: 417 Meadow II.
         b) Mannington:
            (1) LDS New Horizon: New Grove.
            (2) LDS New Horizon: New Medallion.
            (3) LDS New Horizon: New Seasons.
            (4) LDS New Horizon: New Ocean.
2. Carpet Cove Base: 4-1/2 inch (115 mm) wide base made of same carpet from manufacturer as used in each room, but without cushion backing. Top edge of base serged with 1-1/4 inch (32 mm) polyester binding fabric to coordinate with Owner's color scheme. Roll edges of binding fabric under and sew along top edge of carpet cove base.

2.2 ACCESSORIES

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

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

2.3 SOURCE QUALITY CONTROL

A. Tests:
1. Carpet:
   a. Appearance Retention Rating:
      1) Hexapod Test Method: ASTM D5252.
      2) Grading: ASTM D7330.
   b. Antimicrobial Activity: AATCC 174.
   c. British Spill Test: Test Protocol.
   d. Colorfastness:
      1) Crocking: AATCC 165.
      2) Light: AATCC 16.3.
      3) Water: AATCC 107.

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

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

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification of Conditions:
1. Carpet Areas:
a. Verify concrete surfaces are sufficiently cured and moisture content is within acceptable levels before beginning installation as specified in Section 09 0503, 'Floor Substrate Preparation'. If test results exceed limitations, do not proceed with installation, until problem has been corrected:
1) Notify Owner's Representative in writing if floor surface is not acceptable to install carpet:
a) Do not lay carpeting over unsuitable surface. Commencing installation constitutes acceptance of floor and approval of existing conditions.

B. Evaluation And Assessment:
1. Carpet Areas:
a. Variation In Grade:
1) Plus or minus 1/8 inch (3 mm) in any 10 foot (3 meter) of floor slab and distance between high point and low point of slab of 1/2 inch (13 mm).
b. Testing Procedure:
1) Place ends of straightedge on 3/8 inch (10 mm) high shims.
2) Floor is satisfactory if 1/4 inch (6 mm) diameter steel rod rolled under straightedge will not touch anywhere along 10 foot (3 meter) length and 1/2 inch (13 mm) diameter steel rod will not fit under straightedge anywhere along 10 foot (3 meter) length.
c. Notify Owner's Representative in writing if floor surface is not acceptable to install carpet:
d. Do not lay carpet over unsuitable surface. Commencing installation constitutes acceptance of floor and approval of existing conditions.

3.2 PREPARATION

A. Carpet Areas:
1. Flooring Preparation:
a. Owner-Furnished Product Supplier's Responsibility:

1) Prepare floor substrate in accordance with 'CRI Carpet Installation Standard' best practices to receive carpet installation and to provide installation that meets warranty requirements.
2) Verify concrete surface cured, clean, dry, and free of foreign substances that will compromise carpet and/or installation.

b. Concrete floor slab patching:
1) Cracks, chips and joints must be properly patched or repaired.

c. Concrete surface cured, clean, dry, and free of foreign substances that will compromise carpet and/or other flooring installations:
1) Removal of curing compounds.
2) Remove paint, sealer, grease, oil, silicone sealants, and other materials incompatible with flooring adhesives.
3) Removal of overspray from painted walls (essential so glue will stick).

d. Moisture vapor emission tests and alkalinity test of concrete slab has been preformed.
e. Vacuum and damp mop floor areas to receive flooring before flooring installation.

2. Relaxing / Conditioning Carpet:
a. Highly recommended that carpet be unrolled and allowed to relax in installation area for time period that conforms to requirements of manufacturer of product being installed:
b. Protect carpet adequately from soil, dust, moisture and other contaminants.
c. Sundry items, such as adhesives, should also be conditioned.

3. Carpet Accessories:
a. Owner-Furnished Product's Responsibility:
1) Sundry items, such as adhesives, shall be conditioned to building ambient conditions before use.

3.3 INSTALLATION

A. Carpet:
1. General:
a. Install carpet and carpet base in accordance with CRI Carpet Installation Standard (2009) and manufacturer's written instructions supplied with product.
b. Install carpet under edge of metal thresholds where possible. Use specified carpet accessories at exposed edges.

2. Seaming Requirements:
a. Seal seams in accordance with Carpet Manufacturer's instructions and according to CRI Carpet Installation Standard (2009) as applicable. Seam carpet base only at inside corners.
b. No seam separation in carpet and no more observable seams from any standing position than that which is unavoidable using best seaming materials and practices available at time of installation.
c. Lay rooms parallel to respective Corridors. Seam to permit best use of available carpet.
d. Quarter turning allowed only at cross-Corridors longer than 24 feet (7.315 m).
e. Use single or double seams at doorways (single seams preferred). Run nap of pieced carpet in same direction.

B. Carpet Base:
1. Precut base so seams occur only at inside corners.
2. Scribe base to floor.
3. Spread adhesive over back side of base up to bottom of serging on edge or apply three 3/16 inch (4.76 mm).minimum diameter beads of adhesive placed one inch apart on back of base with top bead placed 2 inch (50 mm) down from serged edge of base and spread adhesive over back surface of base up to bottom edge of serging.
a. Bird's mouth finish should only be required when door frame is flush with wall.
b. If bird's mouth is required, terminate at door frames or vertical trim with 45 degree angle, bird mouth cut so serged edge turns down to contact frame or trim.
4. Do not allow adhesive beyond edge of base. Remove excess adhesive.
5. Do not use staples, nails, screws or other mechanical fasteners.
6. Set carpet base on brick walls at height either above or below horizontal mortar joint line.

3.4 FIELD QUALITY CONTROL

A. Field Inspections:
1. Carpeting:
a. Unacceptable carpet after installation shall include but not be limited to:
1) Delaminating carpet from backings.
2) Fiber loss less than specified.
3) Edge raveling.
4) Fuzzing of carpet fibers.
5) Pilling of carpet fibers.
6) Appearance retention less than control samples attached to Agreement.
7) Dye bleeding.
8) Zippering fibers in carpet.
9) Color streaking.
10) Irregular tufts of fiber.
b. Unacceptable workmanship shall include but not be limited to:
1) Improper floor preparation before installation.
2) Failure of adhesive to completely adhere carpet to floor resulting in bubbles, ridges, or ripples where carpet has separated from floor.
3) Seams that do not comply with specified requirements:
a) Raveled or untrimmed seams.
b) Seams not sealed, level, straight, or even.
c) Open seams.
d) Seams visibly open when viewed by Project Manager from standing position.
4) Sequence rolls, commercial match issues created by rolls being installed out of sequence will require correction or replacement.
5) Failure to properly install carpet next to walls and door frames to eliminate gaps or puckering of carpet.
6) Use of unspecified carpet.
7) Carpet base ends not finished to terminate at door frames or vertical trim shall have 45 degree angle 'birdsmouth' finish.
8) Adhesive exposed on carpet, on carpet base, beyond edges of carpet base, and on other surfaces of building.
9) Carpet base that is not scribed to fit against floor with no gaps.
10) Carpet base attached by means other than acceptable carpet base adhesive.

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

3.5 CLEANING

A. General:
1. Carpet Installer's Responsibility:
a. Clean all exposed surfaces of adjoining areas of adhesive spatter before it sets.
b. Carpeting:
1) Remove any soiling and/or staining from carpet.
2) Remove excessive adhesive with manufacturer recommended adhesive removers.

B. Damage to building:

1. Carpeting:
    a. Carpet Installer's Responsibility:
        1) Clean and repair of all damaged surfaces to their original condition from carpet installation.

C. Waste Management:
1. Carpet Installer's Responsibility:
    a. All work areas are to be kept clean, clear and free of debris at all times.
    b. Provide adequate waste receptacles and dispose of materials including all rubbish, wrapping paper, scraps, and trimmings from building and property in approved manner as specified in Section 01 7400 unless pre-arrangements have been made with Owner and estimated costs are included on estimate and Purchase Order (PO).

3.6 PROTECTION

A. Protection of Carpeting:
1. Owner Representative's Responsibility:
    a. No traffic of any kind on newly installed carpet for minimum of twenty four (24) hours after installation is completed.
    b. No wheeled traffic of any kind placement of furniture or equipment on carpet for minimum of forty eight (48) hours after completion of carpet installation.
    c. Protect carpet from abuse, vandalism, or damage occurring after installation is complete.
    d. Protect carpet adequately from soil, dust, moisture and other contaminants after carpet installation.

END OF SECTION

SECTION 09 9001

COMMON PAINTING AND COATING REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

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

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

1.2 REFERENCES

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

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

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

B. Reference Standards:
1. The latest edition of the following reference standard shall govern all painting work:
a. MPI(a), 'Architectural Painting Specification Manual' by Master Painters Institute (MPI), as issued by local MPI Accredited Quality Assurance Association having jurisdiction.
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) Manufacturer's cut sheet for each product indicating ingredients and percentages by weight and by volume, environmental restrictions for application, and film thicknesses and spread rates.
2) Provide one (1) copy of 'MPI Approved Products List' showing compliance for each MPI product specified.
a) MPI Information is available from MPI Approved Products List using the following link: http://www.paintinfo.com/mpi/approved/index.shtml.
3) Confirmation of colors selected and that each area to be painted or coated has color selected for it.
2. Samples: Provide two 4 inch by 6 inch (100 mm by 150 mm) minimum draw-down cards for each paint or coating color selected for this Project.

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

C. Closeout Submittals:
1. Include following in Operations And Maintenance Manual specified in Section 01 7800:
a. Record Documentation:
1) Manufacturer's documentation:
a) Manufacturer's cut sheet for each component of each system.

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

1.4 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. Minimum five (5) satisfactorily completed projects of comparable quality, similar size, and complexity in past three (3) years before bidding.
c. Maintain qualified crew of painters throughout duration of the Work.

d. Upon request, submit documentation.

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.

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

1.6 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.

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

PART 3 - EXECUTION

3.1 APPLICATORS

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

3.2 EXAMINATION

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

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

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

3.3 PREPARATION

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

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

3.4 APPLICATION

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

B. Paint or finish complete all surfaces to be painted or coated as described in Contract Documents, including but not limited to following items.
   1. Metal reveals at ceiling access doors.

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

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

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

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

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

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

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

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

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

3.5 FIELD QUALITY CONTROL

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

3.6 CLEANING

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

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

END OF SECTION

ATTACHMENTS

PART 4 - PAINT COLOR SCHEDULE

A. Related Requirements:
   1. Section 09 9122 'Interior Painted CMU'.
   2. Section 09 9123 'Interior Painted Gypsum Board-Plaster'.
   3. Section 09 9124 'Interior Painted Metal'.
   4. Section 09 9125 'Interior Wood Paint'.

B. Colors:
   1. Interior:
      a. Interior CMU (See Section 09 9122):
         1) Class One Color Quality Standard. Match existing.

      b. Interior Gypsum Board, Plaster (See Section 09 9123):
         1) Class One Color Quality Standard. Match existing.

      c. Interior Metal (See Section 09 9124):
         1) Class One Color Quality Standard. Match existing color.

      d. Interior Painted Wood (See Section 09 9125):
         1) Class One Color Quality Standard. Match existing color.

SECTION 09 9122

INTERIOR PAINTED CMU

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Preparing and painting new interior CMU walls as described in Contract Documents.
   2. Preparing and painting existing interior CMU surfaces listed below as described in Contract Documents:
      a. All walls in new waiting area and new clerks office.
      b. North wall in Stake President's office.

B. Related Requirements:
   1. Section 09 9001: 'Common Painting And Coating Requirements':
      a. 'Attachment: Paint Color Schedule' for O&M / R&I Projects.

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. All :
      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.
   2. New Surfaces:
      a. Use MPI(a) INT 4.2D 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 gypsum board and plaster surfaces as described in Contract Documents.

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

1.2 ADMINISTRATIVE REQUIREMENTS

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

PART 2 - PRODUCTS

2.1 SYSTEM

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

B. Description:
   1. All:
      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.
         1) Remaining Painted Surfaces: Gloss Level 5.

D. Materials:
   1. Primers:
      a. MPI Product 50, 'Primer Sealer, Latex, Interior'.
   2. Finish Coats:

1) Buildings with CMU and Gypsum Board surfaces in same rooms:
   a) MPI Product 77, 'Epoxy, Gloss'.

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.

END OF SECTION

SECTION 09 9124

INTERIOR PAINTED METAL

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Preparing and painting new interior metal surfaces as described in Contract Documents.

B. Related Requirements:
   1. 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.
   2. Section 23 0553: 'I. D. For HVAC Piping And Equipment’ for field painting requirements of HVAC piping and equipment.

1.2 ADMINISTRATIVE REQUIREMENTS

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

B. Sequencing:
   1. Paint lintel furnished under Section 05 1200 before installation of window.

PART 2 - PRODUCTS

2.1 SYSTEM

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

B. Description:
   1. Ferrous Metal:
      a. New Surfaces: Use MPI(a) INT 5.1B Waterborne Light Industrial Finish system.

C. Performance:
   1. Design Requirements:
      a. New Surfaces: MPI Premium Grade finish requirements.
      b. Gloss / Sheen Level Required: Gloss Level 5.

D. Materials:
   1. Primers:
      a. Ferrous Metal: MPI Product 107, ‘Primer, Rust-Inhibitive, Water Based’.
   2. Finish Coats: MPI Product 153: ‘Light Industrial Coating, Interior, Water Based, Semi-Gloss (MPI Gloss Level 5)’.

PART 3 - EXECUTION

3.1 APPLICATION

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

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

END OF SECTION

SECTION 09 9125

INTERIOR PAINTED WOOD

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Preparing and painting new woodwork as described in Contract Documents.

B. Related Requirements:
   1. Section 09 9001: 'Common Painting And Coating Requirements':
      a. 'Attachment: Paint Color Schedule' for O&M / R&I Projects.

PART 2 - PRODUCTS

2.1 SYSTEM

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

B. Description:
   1. Systems:
      a. All Other:
         1) New Surfaces: Use MPI(a) INT 6.3T or U Latex Finish system.
         2) Previously Finished Surfaces: MPI(r) Rin 6.3U 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. Woodwork:
      a. Primer Coat: MPI Product 39, ‘Primer, Latex, for Interior Wood’ or MPI Product 45, ‘Primer Sealer, Alkyd, Interior’.
      b. Finish Coats: MPI Product 153, ‘Light Industrial Coating, Interior, Water Based, Semi-Gloss (MPI Gloss Level 5)’.

PART 3 - EXECUTION

3.1 APPLICATION

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

B. Interface With Other Work:

1. Where back-priming is required, apply one (1) coat of primer.

C. New Surfaces:
   1. Spot prime nail holes, cracks, and blemishes before and after puttying.
   2. Apply stain blocker or other product recommended by Paint Manufacturer to knots before applying primer coat.

D. Existing Painted Surfaces:
   1. Remove deteriorated existing paint down to sound substrate by scraping and sanding. Feather edges of existing paint by sanding to be smooth with adjacent surfaces. Spot prime bare wood areas on woodwork.
   2. Wash surfaces that have been defaced with marking pens, crayons, lipstick, etc, with solvent recommended by Paint Manufacturer. Spot prime such surfaces.
   3. Apply finish coats.

END OF SECTION

SECTION 09 9413

INTERIOR TEXTURED FINISHING

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Furnish and apply texturing on ceilings as described in Contract Documents.

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

1.2 REFERENCES

A. Definitions:
   1. Drywall Texture: Compound rolled, sprayed, or troweled onto sheetrock after taping and floating of joints is complete. Uses same material as joint compound, but thinned down with water and applied to wall surface:
      a. Hawk and Trowel, Multi-Directional: Lightly sanded, (80/20) 80 percent smooth with 20 percent random voids. Resembles aged plaster.
      b. Smooth - Smooth application of texture over sheetrock wall that feathers out sheetrock joints, and creates even, non-textured wall.

1.3 QUALITY ASSURANCE

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

PART 2 - PRODUCTS

2.1 SYSTEM

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

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

PART 3 - EXECUTION

3.1 APPLICATION

A. Location:
   1. Walls:
      a. Hawk And Trowel, Multi-Directional (lightly sanded) Texture:
         1) All areas except those listed in following paragraph.
      b. Smooth:
         1) Restrooms. Mechanical Rooms, Storage Rooms, and other Utility Areas.
   2. Ceilings:
      a. Hawk And Trowel, Multi-Directional (lightly sanded) Texture:
         1) High Council Rooms Areas where there is exposed gypsum board (includes soffit and fascia of coffered area at perimeter).
         2) All other locations not indicated elsewhere.
      b. Smooth Finish (no applied texture) to be applied to the following ceilings:
         1) Font.
         2) Mechanical Rooms, Storage Rooms, and other Utility Areas.

B. Finishing:
   1. Hawk And Trowel, Multi-Directional (lightly sanded) Texture:
      a. After gypsum board is taped and sanded, apply texture. Closely match samples accepted by Architect.
         1) After wall has been textured, apply priming and finish paint as specified in Section 09 9123.
   2. Smooth:
      a. No applied texture is required. Apply priming and paint as specified in Section 09 9123.

END OF SECTION

SECTION 10 1495

MISCELLANEOUS INTERIOR SIGNAGE

PART 1 - GENERAL

1.1 SUMMARY

A. Products Installed But Not Furnished Under This Section:
   1. Owner-furnished interior signs.

B. Related Requirements:
   1. Section 01 6400: Owner will furnish designated interior signs. This Section establishes quality of materials and installation for information of Contractor, Architect, and Owner's Representatives.

PART 2 - PRODUCTS

2.1 OWNER FURNISHED PRODUCTS

A. Category Four Approved Standard Interior Signs. See Section 01 6200 for definitions of Categories:
   1. Visual Identity Office:
      a. Contact Information:
         1) 50 E. North Temple St. Rm. 2350, Salt Lake City, UT 84150-3232.
         2) Phone: 1-801-240-1302.
         3) Fax: 1-801-240-5997.
         4) vidoffice@ldschurch.org.
   2. Room Signs: Molded clear acrylic sub-surface graphics sign with set-screw to attach to included mounting bracket.
   3. Color:
      a. Background: Brown.
      b. Lettering: Gold.

2.2 MANUFACTURED UNITS

A. Signs:
   1. Class Two Quality Standards. See Section 01 6200.
      a. Match existing:
      b. Room Door Signs: Flat clear acrylic sub-surface graphics sign with mounting adhesive in position.
      c. Color:
         1) Background: Brown.
         2) Lettering: Gold.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install interior signs square and plumb:
   1. Room Signs:
      a. Install bracket using two screws. Use proper anchor for substrate.
      b. Attach sign to bracket using set-screw.

c. Mount signs as described in Contract Drawings.

END OF SECTION

SECTION 23 3001

COMMON DUCT REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. General procedures and requirements for ductwork.
   2. Repair leaks in ductwork, as identified by duct testing, at no additional cost to Owner.

B. Related Requirements:
   1. Section 01 4546: 'Duct Testing, Adjusting, and Balancing' for ductwork.

1.2 REFERENCES

A. Reference Standards:
   1. Sheet Metal And Air Conditioning Contractors' National Association / American National Standards Institute:
      a. SMACNA, 'HVAC Duct Construction Standards - Metal and Flexible' (Third Edition).

PART 2 - PRODUCTS

2.1 ASSEMBLIES

A. Performance:
   1. Design Criteria:
      a. Standard Ducts: Construction details not specifically called out in Contract Documents shall conform to applicable requirements of SMACNA, 'HVAC Duct Construction Standards - Metal and Flexible'.

B. Materials:
   1. Duct Hangers:
      a. One inch (25 mm) by 18 ga (1.27 mm) galvanized steel straps or steel rods as shown on Drawings, and spaced not more than 96 inches (2 400 mm) apart. Do not use wire hangers.
      b. Attaching screws at trusses shall be 2 inch (50 mm) No. 10 round head wood screws. Nails not allowed.

PART 3 - EXECUTION

3.1 INSTALLATION

A. During installation, protect open ends of ducts by covering with plastic sheet tied in place to prevent entrance of debris and dirt.

B. Make necessary allowances and provisions in installation of sheet metal ducts for structural conditions of building. Revisions in layout and configuration may be allowed, with prior written approval of Architect. Maintain required airflows in suggesting revisions.

C. Hangers And Supports:

1. Install pair of hangers as required by spacing indicated in table on Drawings.
2. Install upper ends of hanger securely to floor or roof construction above by method shown on Drawings.
3. Attach strap hangers to ducts with cadmium-plated screws. Use of pop rivets or other means will not be accepted.
4. Where hangers are secured to forms before concrete slabs are poured, cut off flush all nails, strap ends, and other projections after forms are removed.
5. Secure vertical ducts passing through floors by extending bracing angles to rest firmly on floors without loose blocking or shimming. Support vertical ducts, which do not pass through floors, by using bands bolted to walls, columns, etc. Size, spacing, and method of attachment to vertical ducts shall be same as specified for hanger bands on horizontal ducts.

3.2 CLEANING

A. Clean interior of duct systems before final completion.

END OF SECTION

SECTION 23 3713

DIFFUSERS, REGISTERS, AND GRILLES

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Furnish and install diffusers, registers, and grilles connected to ductwork as described in Contract Documents.

B. Related Requirements:
   1. Section 23 3001: 'General Duct Requirements'.

1.2 SUBMITTALS

A. Maintenance Material Submittals:
   1. Tools: Leave tool for removing core of each different type of grille for building custodian.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturer Contact List:
   1. Carnes Co, Verona, MI www.carnes.com.
   2. J & J Register, Grand Rapids, MI www.jandjreg.com.
   3. Krueger Air System Components, Richardson, TX www.krueger-hvac.com.
   4. Metal*Aire by Metal Industries Inc, Clearwater, FL www.metalaire.com.
   5. Nailor Industries Inc, Houston, TX or Weston, ON www.nailor.com.
   6. Price Industries Inc, Suwanee, GA www.price-hvac.com or E H Price Ltd, Winnipeg, MB (204) 669-4220.
   7. Titus, Richardson, TX www.titus-hvac.com.
   8. Tuttle & Bailey, Richardson, TX www.tuttleandbailey.com.

2.2 MANUFACTURED UNITS

A. Ceiling Return And Transfer Grilles:
   1. Finish: Off-white baked enamel.
   2. 1/2 inch (12.7 mm) spacing.
   3. See Contract Documents for location of filter grilles.
   4. Category Four Approved Products. See Section 01 6200 for definitions of Categories:
      a. Carnes: RSLA.
      b. J & J: S90H.
      c. Krueger: S85H.
      d. Metal*Aire: SRH.
      e. Nailor: 6155H.
      f. Price: 535.
      g. Titus: 355RL or 355 RS.
      h. Tuttle & Bailey: T75D.

B. Ceiling Diffusers:

1. Finish: Off-white baked enamel.
2. Category Four Approved Products. See Section 01 6200 for definitions of Categories:
   a. Carnes: SKSA.
   b. J & J: R-1400.
   c. Krueger: SH.
   d. Metal*Aire: 5500S.
   e. Nailor: 65OOB.
   f. Price: SMD-6.
   g. Titus: TDC-6.
   h. Tuttle & Bailey: M.

C. Floor / Toe Space Return Grilles:
1. Finish: Clear anodized.
2. Category Four Approved Products. See Section 01 6200 for definitions of Categories:
   a. Carnes: CCJB (with mitered corners welded on face and sanded).
   b. J & J: 2500 with Frame 10.
   c. Krueger: 1500F.
   d. Metal*Aire: 2000F.
   e. Nailor: 49-240-FN-MM.
   f. Price: LBPH-25B.
   g. Titus: CT-540.
   h. Tuttle & Bailey: 4000 CO.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Anchor securely into openings. Secure frames to ductwork by using four sheet metal screws, one per side. Level floor registers and anchor securely into floor.

END OF SECTION

SECTION 26 0501

COMMON ELECTRICAL REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. General electrical system requirements and procedures.
   2. Make electrical connections to equipment provided under other Sections.

B. Related Requirements:
   1. Section 01 3200: 'Construction Process Documentation' for scheduling of equipment and materials removed by Owner.
   2. Section 02 4119: 'Selective Structure Demolition' for salvage of existing electrical items to be reused or recycled.

1.2 REFERENCES

A. Reference Standards:
   1. National Fire Protection Association / American National Standards Institute:
      a. NFPA 70, National Electric Code (NEC).
   2. National Electrical Manufacturing Association Standards (NEMA):
      a. NEMA 250, 'Enclosure for Electrical Equipment (1000 Volts Maximum)'.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Coordinate with Owner for equipment and materials to be removed by Owner.

B. Sequencing:
   1. Include detailed sequence of individual electrical demolition operations on Construction Schedule specified in Section 01 3200.

1.4 SUBMITTALS

A. Action Submittals:
   1. Product Data:
      a. Provide following information for each item of equipment:
         1) Catalog Sheets.
         2) Assembly details or dimension drawings.
         3) Installation instructions.
         4) Manufacturer's name and catalog number.
         5) Name of local supplier.
      b. Furnish such information for following equipment:
         1) Section 26 5100: 'Interior Lighting Fixtures'.
      c. Do not purchase equipment before approval of product data.

B. Informational Submittals:
   1. Test And Evaluation Reports:
      a. Report of site tests, before Substantial Completion.
   2. Qualification Statement:

a. Electrical Subcontractor:
   1) Provide Qualification documentation if requested by Architect or Owner.
b. Installer:
   1) Provide Qualification documentation if requested by Architect or Owner.

C. Closeout Submittals:
1. Include following in Operations And Maintenance Manual specified in Section 01 7800:
   a. Operations and Maintenance Data:
      1) Provide operating and maintenance instructions for each item of equipment submitted under Product Data.
   b. Record Documentation:
      1) Manufacturers documentation:
         a) Manufacturer's literature.
         b) Include copy of approved shop drawings.
         c) Provide tritium exit sign tabulations for each exit sign installed on Project including following:
            (1) Serial number.
            (2) Expiration number.
            (3) Installed building location (example – chapel north rear exit, north corridor east end, main west foyer, etc.).

1.5 QUALITY ASSURANCE

A. Regulatory Agency Sustainability Approvals:
1. NEC and local ordinances and regulations shall govern unless more stringent requirements are specified.
2. Material and equipment provided shall meet standards of NEMA or UL and bear their label wherever standards have been established and label service is available.

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

PART 2 - PRODUCTS

PART 3 - EXECUTION

3.1 INSTALLERS

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

3.2 EXAMINATION

A. Verification Of Conditions:

1. Confirm dimensions, ratings, and specifications of equipment to be installed and coordinate these with site dimensions and with other Sections.

B. Evaluation And Assessment:
   1. All relocations, reconnections, and removals are not necessarily indicated on Drawings. Include such work without additional cost to Owner.

3.3 PREPARATION

A. Disconnect equipment that is to be removed or relocated. Carefully remove, disassemble, or dismantle as required, and store in approved location on site, existing items to be reused in completed work.

B. Where affected by demolition or new construction, relocate, extend, or repair raceways, conductors, outlets, and apparatus to allow continued use of electrical system. Use methods and materials as specified for new construction.

C. Perform drilling, cutting, block-offs, and demolition work required for removal of necessary portions of electrical system. Do not cut joists, beams, girders, trusses, or columns without prior written permission from Architect.

D. Remove concealed wiring abandoned due to demolition or new construction. Remove circuits, conduits, and conductors that are not to be re-used back to next active fixture, device, or junction box.

E. Patch, repair, and finish surfaces affected by electrical demolition work, unless work is specifically specified to be performed under other Sections of the specifications.

3.4 INSTALLATION

A. General:
   1. Locations of electrical equipment shown on Drawings are approximate only. Field verify actual locations for proper installation.
   2. Coordinate electrical equipment locations and conduit runs with those providing equipment to be served before installation or rough in.
      a. Notify Architect of conflicts before beginning work.
      b. Coordinate locations of power and lighting outlets in mechanical rooms and other areas with mechanical equipment, piping, ductwork, cabinets, etc, so they will be readily accessible and functional.
   3. Work related to other trades which is required under this Division, such as cutting and patching, trenching, and backfilling, shall be performed according to standards specified in applicable Sections.

3.5 FIELD QUALITY CONTROL

A. Field Tests:
   1. Test systems and demonstrate equipment as working and operating properly. Notify Architect before test. Rectify defects at no additional cost to Owner.
   2. Measure current for each phase of each motor under actual final load operation, i.e. after air balance is completed for fan units, etc. Record this information along with full-load nameplate current rating and size of thermal overload unit installed for each motor.

3.6 CLEANING

A. Remove obsolete raceways, conductors, apparatus, and lighting fixtures promptly from site and dispose of legally.

3.7 CLOSEOUT ACTIVITIES

A. Training:
   1. Provide competent instructor for three (3) days to train Owner's maintenance personnel in operation and maintenance of electrical equipment and systems. Factory representatives shall assist this instruction as necessary. Schedule instruction period at time of final inspection.

END OF SECTION

SECTION 26 0533

RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
1. Quality of material and installation procedures for raceway, boxes, and fittings used on Project but furnished under other Divisions.
2. Furnish and install raceway, conduit, and boxes used on Project not specified to be installed under other Divisions.
3. Furnish and install air-vapor barrier boxes as described in Contract Documents.
4. Furnish and install main electrical service raceway as described in Contract Documents and comply with electrical utility company requirements.
5. Furnish and install main telephone service raceway as described in Contract Documents and comply with telephone company requirements.

B. Related Requirements:
1. Section 26 0501: 'Common Electrical Requirements' for general electrical requirements'.

1.2 REFERENCES

A. Reference Standards:
1. National Fire Protection Association:
a. NFPA (Fire) 70, 'National Electric Code (NEC)' (2014 Edition or most recent edition adopted by AHJ including all applicable amendments and supplements).

PART 2 - PRODUCTS

2.1 SYSTEM

A. Manufacturers:
1. Manufacturer Contact List:
a. Cooper B-Line, Highland, IL www.b-line.com.
b. Hubbell Incorporated, Milford, CT www.hubbell-wiring.com or Hubbell Canada Inc, Pickering, ON (905) 839-4332.
c. Square D, Palatine, IL www.squared.com.
d. Thomas & Betts, Memphis, TN www.tnb.com or Thomas & Betts Ltd, Iberville, PQ (450) 347-5318.
e. Walker Systems Inc, Williamstown, WV (800) 240-2601 or Walker Systems Inc / Wiremold Canada Inc, Fergus, ON (519) 843-4332.
f. Wiremold Co, West Hartford, CT www.wiremold.com.

B. Materials:
1. Raceway And Conduit:
a. Sizes:
1) 3/4 inch (19 mm) for exterior use, unless indicated otherwise.
2) 1/2 inch (13 mm) for interior use, unless indicated otherwise.
b. Types: Usage of each type is restricted as specified below by product.

1) Galvanized rigid steel or galvanized intermediate metal conduit (IMC) is allowed for use in all areas. Where in contact with earth or concrete, wrap buried galvanized rigid steel and galvanized IMC conduit and fittings completely with vinyl tape.
2) Galvanized Electrical Metallic Tubing (EMT) and Flexible Steel Conduit:
   a) Allowed for use only in indoor dry locations where it is:
      (1) Not subject to damage.
      (2) Not in contact with earth.
      (3) Not in concrete.
   b) For metal conduit systems, flexible steel conduit is required for final connections to indoor mechanical equipment.
3) Schedule 40 Polyvinyl Chloride (PVC) Conduit:
   a) Allowed for use only underground or below concrete with galvanized rigid steel or IMC elbows and risers.
4) Listed, Liquid-Tight Flexible Metal Conduit:
   a) Use in outdoor final connections to mechanical equipment, length not to exceed 36 inches (900 mm).
5) Pre-wired 3/8 Inch (9.5 mm) Flexible Fixture Whips: Allowed only for connection to recessed lighting fixtures, lengths not to exceed 72 inches (1 800 mm).

c. Prohibited Raceway Materials:
   1) Aluminum conduit.
   2) Armored cable type AC (BX) cable.

2. Raceway And Conduit Fittings:
   a. Rigid Steel Conduit And IMC: Threaded and designed for conduit use.
   b. EMT:
      1) Compression type.
      2) Steel set screw housing type.
   c. PVC Conduit:
      1) PVC type. Use PVC adapters at all boxes.
      2) PVC components, (conduit, fittings, cement) shall be from same Manufacturer.
   d. Flexible Steel Conduit: Screw-in type.
   e. Liquid-tight Flexible Metal Conduit: Sealtite type.
   f. Expansion fittings shall be equal to OZ Type AX sized to raceway and including bonding jumper.
   g. Prohibited Fitting Materials:
      1) Crimp-on, tap-on, indenter type fittings.
      2) Cast set-screw fittings for EMT.
      3) Spray (aerosol) PVC cement.
3. Multi-Outlet Assemblies:
   a. 18 inches (450 mm) between outlets.
   b. Category Four Approved Products. See Section 01 6200 for definitions of Categories.
      1) 2GW Series by Walker.
      2) Plugmold 20GB Series by Wiremold.
4. Seal Devices: OZ Type WSK.
5. Outlet Boxes:
   a. Galvanized steel of proper size and shape are acceptable for all systems. Where metal boxes are used, provide following:
      1) Provide metal supports and other accessories for installation of each box.
      2) Equip ceiling and bracket fixture boxes with fixture studs where required.
      3) Equip outlets in plastered, paneled, and furred finishes with plaster rings and extensions to bring box flush with finish surface.
   b. Non-metallic boxes may be used only for control voltage wiring systems.
   c. Telephone / data outlet boxes shall be single device outlet boxes.
   d. HVAC Instrumentation And Control:
      1) Junction boxes in mechanical equipment areas shall be 4 inches (100 mm) square.
      2) Boxes for remote temperature sensor devices shall be recessed single device.
      3) Boxes for thermostats shall be 4 inches (100 mm) square with raised single device cover.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification Of Conditions:
   1. Confirm dimensions, ratings, and specifications of materials to be installed and coordinate these with site dimensions and with other Sections.

3.2 INSTALLATION

A. Interface With Other Work:
   1. Coordinate with Divisions 22 and 23 for installation of raceway for control of plumbing and HVAC equipment.
   2. Before rough-in, verify locations of boxes with work of other trades to insure that they are properly located for purpose intended.
      a. Coordinate location of outlets adjacent to or in millwork with Division 06 before rough-in. Refer conflicts to Architect and locate outlets under his direction.
   3. Install pull wires in raceways installed under this Section where conductors or cables are to be installed under other Divisions.

B. Conduit And Raceway:
   1. Conceal raceways within ceilings, walls, and floors, except at Contractor's option, conduit may be exposed on walls or ceilings of mechanical equipment areas and above acoustical panel suspension ceiling systems. Install exposed raceway runs parallel to or at right angles to building structure lines.
   2. Seal all raceways penetrating fire rated walls, ceilings and barriers. See Section 07 8400.
   3. Keep raceway runs 6 inches (150 mm) minimum from hot water pipes.
   4. Make no more than four quarter bends, 360 degrees total, in any conduit run between outlet and outlet, fitting and fitting, or outlet and fitting.
      a. Make bends and offsets so conduit is not injured and internal diameter of conduit is not effectively reduced.
      b. Radius of curve shall be at least minimum indicated by NFPA 70.
   5. Cut conduit smooth and square with run and ream to remove rough edges. Cap raceway ends during construction. Clean or replace raceway in which water or foreign matter have accumulated.
   6. Install insulated bushings on each end of raceway 1-1/4 inches (32 mm) in diameter and larger, and on all raceways where cables emerge. Install expansion fittings where raceways cross building expansion joints.
   7. Bend PVC conduit by hot box bender and, for PVC 2 inches (50 mm) in diameter and larger, expanding plugs. Apply PVC adhesive only by brush.
   8. Installation In Framing:
      a. Do not bore holes in joists or beams outside center 1/3 of member depth or within 24 inches (600 mm) of bearing points. Do not bore holes in vertical framing members outside center 1/3 of member width.
      b. Holes shall be one inch (25 mm) diameter maximum.
   9. Underground Raceway And Conduit:
      a. Bury underground raceway installed outside building 24 inches (600 mm) deep minimum.
      b. Bury underground conduit in planting areas 24 inches (600 mm) deep minimum. It is permissible to install conduit 6 inch (150 mm) below concrete sidewalks, however, conduit must be buried 24 inches (600 mm) deep at point of exit from planting areas.
   10. Conduit And Raceway Support:
      a. Securely support raceway with approved straps, clamps, or hangers, spaced as required.
      b. Do not support from mechanical ducts or duct supports without Architect's written approval. Securely mount raceway supports, boxes, and cabinets in an approved manner by:
         1) Expansion shields in concrete or solid masonry.
         2) Toggle bolts on hollow masonry units.
         3) Wood screws on wood.

4) Metal screws on metal.

11. Prohibited Procedures:
    a. Use of wooden plugs inserted in concrete or masonry units for mounting raceway, supports, boxes, cabinets, or other equipment.
    b. Installation of raceway that has been crushed or deformed.
    c. Use of torches for bending PVC.
    d. Spray applied PVC cement.
    e. Boring holes in truss members.
    f. Notching of structural members.
    g. Supporting raceway from ceiling system support wires.
    h. Nail drive straps or tie wire for supporting raceway.

C. Telephone / Data Systems:
1. Install raceway from terminal board to each telephone and data outlet as indicated on Contract Drawings.

D. Boxes:
1. Boxes shall be accessible and installed with approved cover.
2. Do not locate device boxes that are on opposite sides of framed walls in the same stud space. In other wall construction, do not install boxes back to back.
3. Locate boxes so pipes, ducts, or other items do not obstruct outlets.
4. Install outlets flush with finished surface and level and plumb.
5. Support switch boxes larger than two-gang with side brackets and steel bar hangers in framed walls.
6. At time of substantial completion, install blank plates on uncovered outlet boxes that are for future use.
7. Location:
    a. Install boxes at door locations on latch side of door, unless explicitly shown otherwise on Contract Drawings. Verify door swings shown on electrical drawings with architectural drawings, and report discrepancies to Architect before rough-in. Distance of box from jamb shall be 6 inches (150 mm) from door jamb.
    b. Properly center boxes located in walls with respect to doors, panels, furring, trim and consistent with architectural details. Where two or more outlets occur, space them uniformly and in straight lines with each other, if possible.

END OF SECTION

SECTION 26 5100

INTERIOR LIGHTING

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Furnish and install lighting system as described in Contract Documents, complete with lamps.

B. Related Requirements:
   1. Section 26 0501: 'Common Electrical Requirements'.

C. Reference Standards:
   1. American National Standards Institute (ANSI):
      a. ANSI C78.377-2015, 'American National Standard for Electric Lamps: Specification for the Chromaticity of Solid State Lighting Products'.
   2. Federal Communications Commission (FCC):
      a. Code of Federal Regulations (CFR):
         1) FCC 47 CFR Part 18, 'Industrial, Scientific, and Medical Equipment'.
   3. Institute of Electrical and. Electronics Engineers (IEEE):
      a. IEEE C62.41.1-2002, 'Guide on the Surge Environment in Low-Voltage (1000 V and Less) AC Power Circuits'.

PART 2 - PRODUCTS

2.1 ASSEMBLIES

A. Manufacturers:
   1. Manufacturer Contact List:
      a. Advance Transformer Co, Rosemont, IL www.advancetransformer.com.
      b. Cooper Wiring Devices by Eaton, Peachtree City, GA www.cooperindustries.com.
      c. General Electric Lighting, Hendersonville, NC or General Electric Lighting Canada Inc, Mississauga, ON www.gelighting.com/na.
      d. Howard Lighting Products, Laurel, MS www.howard-ind.com.
      e. Novitas Inc, Peachtree City, GA www.novitas.com.
      f. Osram Sylvania, Danvers, MA www.sylvania.com or Osram Sylvania Ltd, Mississauga, ON (905) 673-6171.
      g. Philips Lighting Co, Somerset, NJ www.lighting.philips.com/nam or Philips Lighting Canada, Scarborough, ON (416) 292-3000.
      h. Universal Lighting Technologies, Nashville, TN www.universalballast.com.
      i. Venture Lighting International, Solon, OH www.venturelighting.com.
      j. Watt Stopper Inc, Santa Clara, CA www.wattstopper.com.
      k. Westinghouse Lighting Corp, Philadelphia, PA www.westinghouselightbulbs.com.
   2. Product Options: When several lighting fixtures are specified by name for one use on Drawings, select any one of those specified. Do not mix fixtures from different manufacturers specified for one use.

B. Materials
   1. Lighting Fixtures:
      a. Type One Acceptable Products:
         1) Surface mounted light fixtures to be low profile wraparound fixtures with 0.125 Acrylic Prismatic lense, with electronic Ballast. See 2.1 A for acceptable manufacturers.

2) Equals as approved by Architect before bidding. See Section 01 6200.

2. Fluorescent Ballasts:
   a. Energy saving electronic for T8 lamps:
      1) Program rapid start type.
      2) Parallel circuit type.
      3) Minimum power factor of 95 percent.
      4) Maximum total harmonic distortion of 10 percent.
      5) Operation of lamps in compliance with Lamp Manufacturer's recommendations.
      6) Minimum starting temperature 0 deg F (minus 17.8 deg C) for T8 lamps.
      7) Class A sound rating.
      8) Transient protection in accordance with IEEE / ANSI C62.41.1, Category A.
      9) Comply with FCC 47 CFR Part 18.
      10) Ballast factor of 0.78.
      11) Maximum crest factor of 1.7.
      12) Five year full replacement warranty including labor allowance for replacement.
      13) Input voltage to match system voltage.
      14) Category Four Approved Products and Manufacturers. See Section 01 6200 for definitions of Categories:
         a) IOP2PSP32LWSC by Advance.
         b) GE32-MVPS-L by General Electric.
         c) QHE-UNV-PSX-SC by Osram / Sylvania.
3. Lamps:
   a. T8 Fluorescent Lamps:
      1) Minimum initial output of 3100 Lumens.
      2) Rated life of 40,000 hrs at 3 hrs per start for lamps operated on instant start ballasts.
      3) Minimum CRI 85.
      4) Meet Federal TCLP criteria.
      5) Category Four approved Manufacturers. See Section 01 6200 for definitions of Categories:
         a) General Electric.
         b) Howard.
         c) North American Philips.
         d) Osram / Sylvania.
      6) Correlated Color Temperature: 3000k – 4100k match existing lamps.
   b. Other Lamps:
      1) Category Four Approved Manufacturers. See Section 01 6200 for definitions of Categories:
         a) General Electric.
         b) North American Philips.
         c) Osram / Sylvania.
         d) Westinghouse.
   c. LED Lamps and Fixtures:
      1) Replacement Lamps shall have minimum efficiency of 70 lm / W per LM 79.
      2) Integral LED Lamps shall have minimum efficiency of 90 lm / W per LM 79.
      3) Provide minimum rated life of 50,000 per LM 80 and LM 70 standards.
      4) Color Temperature: 3000k.
      5) Provide full spectrum color index of 65.
4. Daylight Lighting Switching System:
   a. Complete system enabling control of up to six 277V circuits by daylighting photocell mounted in skylight.
   b. System components include, but are not limited to, following items. Except for photocell, install components in single, locking enclosure:
      1) 20 to 2000 foot candle photocell with necessary mounting hardware.
      2) Control relays or contactors and transformers for up to six circuits
      3) Sensor controller with HIGH, LOW, and DEAD BAND adjustments.
   c. Category Four Approved Manufacturers. See Section 01 6200 for definitions of Categories:
      1) Cooper Lighting.
      2) Watt Stopper.

C. Factory Assembly:

1. Fixtures shall be fully assembled complete with necessary wiring, sockets, lamps, reflectors, ballasts, auxiliaries, plaster frames, recessing boxes, hangers, supports, lenses, diffusers, and other accessories essential for complete working installation.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Interface With Other Work:
   1. Coordinate with Sections under 09 5000 heading to obtain symmetrical arrangement of fixtures in acoustic tile ceiling as shown on Reflected Ceiling Plan in Contract.
   2. In mechanical equipment rooms, coordinate locations of light fixtures with equipment locations to provide proper room illumination without obstruction. Suspend fixtures that must be mounted below pipes, ducts, etc, with chains or other Architect approved method.

B. Securely mount fixtures. Support fixtures weighing 50 lbs (23 kg) or more from building framing or structural members.

C. Fasten lay-in fluorescent fixtures to ceiling suspension system on each side with bolts, screws, rivets, or clips. In addition, connect lay-in fixtures with two (2) No. 12 gauge diagonal wires with three (3) turns each end; two (2) per fixture minimum to building framing or structural members. Connect to opposing corners of fixture. Wires may be slightly slack. Make final conduit connections to lay-in fluorescent fixtures with specified flexible conduit or flexible fixture whips.

D. Where fluorescent fixtures are shown installed end to end, provide suitable connectors or collars to connect adjoining units to appear as a continuous unit.

3.2 ADJUSTMENT

A. Repair scratches or nicks on exposed surfaces of fixtures to match original undamaged conditions.

END OF SECTION