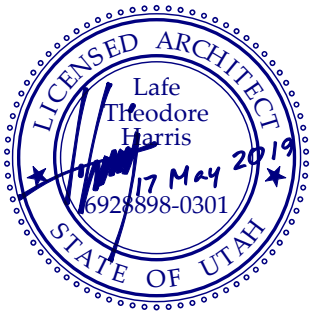
THE CHURCH OF
JESUS CHRIST
OF LATTER-DAY SAINTS



Hillcrest 4, 9 Wheelchair Lift
Orem UT Hillcrest Stake

Property Number: 505-4214 | 440 East 800 South, Orem, Utah | BHDA Project Number: 1916

Architect
Lafe Harris — lafe@bhdarchitects.com
B H D Architects
65 East Wadsworth Park Drive, Suite 205
Draper, Utah 84020
Phone - 801.571.0010
Mobile - 801.367.0608

Owner - Project Manager
Tom Howell — THH@ChurchofJesusChrist.org
American Fork UT PM Group
110 East Main Street
American Fork, Utah 84003
Phone - 480.243.5710
Mobile - 480.243.5710

Owner - Facilities Manager
Nick Cluff — CluffND@ChurchofJesusChrist.org
Orem UT FM Group
135 South 800 East
American Fork, Utah 84059
Phone - 801.222.3160
Mobile - 801.750.1172

Structural Engineer
Conrad Guymon — conradg@ckrengineers.com
CKR Engineers
1295 North State Street
Orem, Utah 84057
Phone - 801.222.0922
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Electrical Engineer
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Spectrum Engineers
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Salt Lake City, Utah 84111
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Mobile - 801.201.8369

INTRODUCTORY INFORMATION

B L A N K P A G E

TABLE of CONTENTS

FACILITY CONSTRUCTION SUBGROUP

DIVISION 02: EXISTING CONDITIONS

DIVISION 03: CONCRETE

DIVISION 04: MASONRY

DIVISION 06: WOOD, PLASTICS, AND COMPOSITES

FACILITY SERVICES SUBGROUP

DIVISION 26: ELECTRICAL

BIDDING REQUIREMENTS

FOR SMALL PROJECTS (U.S.)

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INVITATION TO BID (U.S.)

1. CONTRACTORS INVITED TO BID THE PROJECT:

Dynamic Construction
Gines Construction
Majestic Builders
Stone River Construction

2. PROJECT:

Hillcrest 4, 9 Wheelchair Lift
Project Number: 505-4214

3. LOCATION:

440 East 800 South
Orem, UT 84097

4. OWNER:

Corporation of the Presiding Bishop of
The Church of Jesus Christ of Latter-day Saints, a Utah corporation sole
c/o
Tom Howell
American Fork Project Management Office

5. CONSULTANT:

Lafe Harris
BHD Architects

6. DESCRIPTION OF PROJECT:

A. New step lift to access Cultural Center.

B. Products or systems may be provided under a Value Managed Relationship (VMR) the Owner has negotiated with the supplier. VMR products and systems are indicated as such in the Specifications.

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

8. TIME OF SUBSTANTIAL COMPLETION: The time limit for substantial completion of this work will be 150 calendar days and will be as noted in the Agreement.

9. BID OPENING: Sealed bids will be received and publicly opened on Thu, 29 May 2019 at 3:00 PM at the American Fork Project Management Office: 110 East Main Street, American Fork, UT 84003 .

10. BIDDING DOCUMENTS:

A. Bidding Documents may be examined at the following plan room locations:
   1) Dodge Data & Analytics
      Kim McCallon
      kim.mccallon@construction.com, 859.885.1091

   2) Mountainlands Area Plan Room

Mike Luke
mike@maprutah.com, 801.288.1188

B. Bidding Documents are available to invited Contractors with a deposit of $_____ per set. Deposit will be refunded if documents are returned complete and in good condition within five days of bid opening.

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

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

END OF DOCUMENT

INSTRUCTIONS TO BIDDERS (U.S.)

1. DOCUMENTS:

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

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

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

2. BIDDER'S REPRESENTATIONS:

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

3. BIDDING DOCUMENTS:

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

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

C. Substitutions and Equal Products
   1) 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.
   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 "Agreement Between Owner and Contractor for Small Project (U.S.)" provided by Owner.

7. MISCELLANEOUS:

A. Pre-Bid Conference. A pre-bid conference will be held on Fri, 17 May 2019 at 11:00 AM at 440 East 800 South, Orem, UT 84097.

B. Examination Schedule for Existing Building and Site
   1) Nick Cluff, Orem South FM Group, 801.222.3160, 1035 South 800 East, Orem, UT 84059

END OF DOCUMENT

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BID FORM

FOR GENERAL CONTRACT WORK (U.S.)

PROJECT IDENTIFICATION:

Hillcrest 4, 9 Wheelchair Lift
Project Number: 505-4214

OWNER:

Corporation of the Presiding Bishop of the Church of Jesus Christ of Latter-day Saints, a Utah corporation sole ("Owner")
Tom Howell, American Fork Project Management Office

CONSULTANT:

Lafe Harris, BHD Architects

BID

1. In submitting this Bid, Bidder represents that:
   a. If this Bid is accepted, Bidder will enter into an agreement with Owner to perform and furnish the Work described in the Bidding Documents for the Bid Price and within the Time of Substantial Completion indicated in this Bid and in accordance with the other terms and conditions of the Contract Documents.
   b. Bidder has carefully examined the Bidding Documents consisting of the Project Manual containing the Bidding Requirements, the Conditions of the Contract, and the Specifications, entitled **Hillcrest 4, 9 Wheelchair Lift Project Manual 2019.05.17**, the Drawings entitled **Hillcrest 4, 9 Wheelchair Lift** and dated **17 May 2019**, and including sheets numbered **A101, A301, S101, S501, S601, E101** and addenda numbers _____.
   c. Bidder has examined the site of the work, existing conditions, and all other conditions affecting the work on the above-named Project.
   d. Bidder has carefully correlated the information known to Bidder and information and observations obtained from visits to the site with the Bidding Documents.
   e. Bidder is familiar with federal, State, and local laws and regulations applicable to Project.
   f. Bidder guarantees there will be no revisions or withdrawal of bid amount for forty-five (45) days after the bid opening.

2. Bidder hereby proposes to furnish all materials, labor, equipment, tools, transportations, services, licenses, fees, permits, etc., required by said documents to complete the Work described by the Contract Documents for the lump-sum of: _____ Dollars ($ _____).

3. Bidder agrees to achieve substantial completion of the Work within the number of days indicated in the Invitation to Bid.

RESPECTFULLY SUBMITTED:

_____
Signature

_____
Printed name

_____
Title

_____
Company name

_____
Business Address

_____ _____
Date City, State, and Zip Code

_____ _____
License No. Telephone Fax

_____
Contact Email Address

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CONSTRUCTION MATERIAL ASBESTOS STATEMENT (U.S.)

PROJECTS FOR:
CORPORATION OF THE PRESIDING BISHOP OF
THE CHURCH OF JESUS CHRIST OF LATTER-DAY SAINTS

Building Name: _____

Building Plan Type: _____

Building Address: _____

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

Project Number: _____

Completion Date: _____

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

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

_____
Company Name

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

_____ _____
General Contractor (signature) Date

_____
Company Name

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

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

1. **Property/Project.**

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

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

3. **Contract Documents.** Contract Documents consist of:
   a. This Agreement;
   b. Supplementary Conditions for Small Project Agreement Between Owner and Contractor (U.S.);
   c. The Specifications (Division 01 and Divisions _____);
   d. Drawings entitled and dated _____;
   e. Addendum No. with date(s) _____;
   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 ($_____) (the "Contract Sum"). This Contract Sum includes all labor, materials, equipment, tools, costs, expenses, work and services of Contractor and its subcontractors necessary to perform the Work in accordance with the terms of this Agreement, including without limitation travel, communications, and copying costs.

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

6. **Extras and Change Orders.** Owner may order changes in the Work by altering, adding to, or deducting from the Work. In the event of such a change, the Contract Sum and/or the time of completion will be adjusted to reflect the change by means of a written Change Order signed by Contractor and Owner. Contractor will not

SAMPLE

commence work on any change until either: (a) Contractor and Owner have executed a Change Order; or (b) Owner has issued a written order for the change acknowledging that there is a dispute regarding the compensation adjustment relating to the change. If Contractor proceeds with a change in the Work without complying with the preceding sentence, Contractor agrees that it will not be entitled to any additional compensation for such change.

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

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

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

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

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

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

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

14. **Indemnity and Hold Harmless.**
   a. Contractor will indemnify and hold harmless Owner and Owner's representatives, employees, agents, architects, and consultants from and against any and all claims, liens, damages, liability, demands, costs, judgments, awards, settlements, causes of action, losses and expenses (collectively "Claims" or "Claim"), including but not limited to attorney fees, consultant fees, expert fees, copy costs, and other expenses, arising out of or resulting from performance of or failure to perform the Work, attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of real or personal property, including loss of use resulting therefrom, except to the extent that such liability arises out of the negligence of Owner, its representatives, agents, and employees. This indemnity includes, without limitation, indemnification of Owner from all losses or injury to Owner's property, except to the extent that such loss or injury arises out of the negligence of Owner, its representatives, agents, and employees. This indemnity applies, without limitation, to include Claims occurring both during performance of the Work and/or subsequent to

SAMPLE

completion of the Work. In the event that any Claim is caused in part by a party indemnified hereunder, that party will bear the cost of such Claim to the extent it was the cause thereof. In the event that a claimant asserts a Claim for recovery against any party indemnified hereunder, the party indemnified hereunder may tender the defense of such Claim to Contractor. If Contractor rejects such tender of defense and it is later determined that the negligence of the party indemnified hereunder did not cause all of the Claim, Contractor will reimburse the party indemnified hereunder for all costs and expenses incurred by that party in defending against the Claim. Contractor will not be liable hereunder to indemnify any party for damages resulting from the sole negligence of that party.

b. In addition to the foregoing, Contractor will be liable to defend Owner in any lawsuit filed by any Subcontractor relating to the Project. Where liens have been filed against Owner's property, Contractor (and/or its bonding company which has issued bonds for the Project) will obtain lien releases and record them in the appropriate county and/or local jurisdiction and provide Owner with a title free and clear from any liens of Subcontractors. In the event that Contractor and/or its bonding company are unable to obtain a lien release, Owner in its absolute discretion may require Contractor to provide a bond around the lien or a bond to discharge the lien, at Contractor's sole expense.
c. In addition to the foregoing, Contractor will indemnify and hold Owner harmless from any claim of any other contractor resulting from the performance, nonperformance or delay in performance of the Work by Contractor.
d. The indemnification obligation herein will not be limited by a limitation on the amount or type of damages, compensation or benefits payable by or for Contractor or a Subcontractor under workers compensation acts, disability benefit acts, or other employee benefit acts.

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

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

17. **Contractor's Insurance.** Prior to performing any work, Contractor will obtain and maintain during the term of this Agreement the following insurance:
    a. Workers Compensation Insurance or evidence of exemption.
    b. Employers Liability Insurance with minimum limits of the greater of $500,000 E.L. each accident, $500,000 E. L. disease-each employee, $500,000 E.L. disease-policy limit or as required by the law of the state in which the Project is located.
    c. Commercial General Liability Insurance – ISO Form CG 00 01 (12/07) or equivalent Occurrence policy which will provide primary coverage to the additional insureds (the Owner and the Architect) in the event of any Occurrence, Claim, or Suit with:
        1) Limits of the greater of: Contractor's actual coverage amounts or the following:
            a) $2,000,000 General Aggregate;
            b) $2,000,000 Products - Comp/Ops Aggregate;
            c) $1,000,000 Personal and Advertising Liability;
            d) $1,000,000 Each Occurrence; and
            e) $50,000 Fire Damage to Rented Premises (Each Occurrence)
        2) Endorsements attached to the General Liability policy including the following or their equivalent:
            a) ISO Form CG-25-03 (05/09), Amendment of Limits of Insurance (Designated Project or Premises) describing the Agreement and specifying limits as shown above.
            b) ISO Form CG 20 10 (07/04), Additional Insured – Owners, Lessees, Or Contractors (Form B),

SAMPLE

naming Owner and Architect as additional insureds.

d. Automobile Liability Insurance, with:
   1) Combined Single Limit each accident in the amount of no less than $500,000; and
   2) Coverage applying to "Any Auto" or its equivalent.

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

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

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

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

SAMPLE

balance, Contractor will pay the difference to Owner. Contractor will provide to Owner all warranty, as built, inspection, and other close out documents as well as materials that Contractor has in its possession or control at the time of termination. Without limitation, Contractor's indemnities and obligations as well as all warranties relative to Work provided through the date of termination survive a termination hereunder.

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

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

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

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

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

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

27. **Confidentiality.** Contractor shall ensure that Contractor and its subcontractors, and the employees, agents and representatives of Contractor and its subcontractors, maintain in strict confidence, and shall use and

SAMPLE

disclose only as authorized by Owner all Confidential Information of Owner that Contractor receives in connection with the performance of this Agreement. Notwithstanding the foregoing, Contractor may use and disclose any information to the extent required by an order of any court or governmental authority, but only after it has notified Owner and Owner has had an opportunity to obtain reasonable protection for such information in connection with such disclosure. For purposes of this Agreement, "Confidential Information" means:

a. The name or address of any affiliate, customer or contractor of Owner or any information concerning the transactions of any such person with Owner;
b. Any contracts, agreements, business plans, budgets or other financial information, renderings, photographs, and materials provided by Owner, relating to the Work or any improvement on the Project Site to the extent such has not been made available to the public by the Owner;
c. Any other information that is marked or noted as confidential at the time of its disclosure.

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

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

29. **Entire Agreement.** This Agreement contains the entire and integrated agreement between the parties hereto and supersedes all prior negotiations, representations, or agreements, either written or oral, relating to the Project. This Agreement may be amended only by a writing signed by both parties. This Agreement will not be construed to create a contractual relationship of any kind between any persons or entities other than Owner and Contractor.

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

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

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

SAMPLE

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:

SAMPLE

SUPPLEMENTARY CONDITIONS

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

ITEM 1 - GENERAL

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

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

ITEM 2 - LIQUIDATED DAMAGES PAYABLE TO OWNER

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

Delay in Completion of the Work. For each day after the expiration of the designated Time of Completion that Contractor has not completed the Work, Contractor will pay Owner the amount of Two Hundred and 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 - PERMITS

1. Delete Paragraph 11 of the Small Project Agreement Between Owner and Contractor (U.S.) and replace with the following:

    11. Contractor will obtain and pay for the building permit, and all other permits, utility connection fees, governmental fees, and inspections necessary for the proper execution and completion of the Work. Do not include these fees in the Bid Amount. The Owner will reimburse the Contractor for the payment of these permits and fees. The reimbursement of these permits and fees will not be part of and will be processed separately from the project's Contract Sum.

ITEM 4 - STATE SPECIFIC SUPPLEMENTARY CONDITIONS

Utah

UTAH STATE SALES TAX:

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

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

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

UTAH NOTICE OF INTENT TO OBTAIN FINAL COMPLETION:

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

A. Contractor shall file with the State Construction Registry, on its own behalf and/or on behalf of Owner, a notice of intent to obtain final completion at least 45 days before the day on which the Owner or Contractor files or could file a notice of completion under Utah Code Ann.

Section 38-1a-506 if:

1. The completion of performance time under the original contract for construction work is greater than 120 days;
2. The total original construction contract price exceeds $500,000; and
3. The original contractor or owner has not obtained a payment bond in accordance with Utah Code Ann. Section 14-2-1.

UTAH NOTICE OF COMPLETION:

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

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

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

UTAH STATE PROGRESS PAYMENTS AND FINAL PAYMENT:

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

5. <u>Payment</u>

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

b. Progress Payments: Not more than once each month, Contractor will submit a payment request to Owner. Owner will pay Contractor progress payments for work completed within fifteen (15) days after Owner receives:
   1. Contractor's progress payment request for work to date;
   2. A certification by Contractor that Contractor has paid for all labor, materials, and equipment relating to the Work covered by prior payment requests and that Contractor will pay for all labor, materials, and equipment relating to the Work covered by the current payment request; and
   3. Conditional Waiver and Release Upon Progress Payment documents submitted by Contractor (in content complying with Utah Code § 38-1a-802) executed by each of the subcontractors performing work and/or providing materials covered by the Contractor's progress payment request.

c. Final Payment: Owner will make full and final payment of the Contract Sum due within thirty (30) days of the completion of all of the following requirements:
   1. Contractor has submitted its final payment request;
   2. Contractor has submitted a certification that Contractor has paid for all labor, materials, and equipment relating to the Work covered by prior payment requests and that Contractor will pay for all labor, materials, and equipment relating to the Work covered by the final payment request; and
   3. Contractor has submitted Waiver and Release Upon Final Payment documents (in content complying with Utah Code § 38-1a-802) executed by each of the subcontractors

performing work and/or providing materials covered by the Contractor’s final payment request.

Acceptance of final payment by Contractor or any Subcontractor will constitute a waiver of claims by the payee except for those claims previously made to Owner in writing and identified by Contractor in its affidavit as still pending.

If the aggregate of previous payments made by Owner exceeds the amount due Contractor, Contractor will reimburse the difference to Owner.

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

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

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

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

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. Reference Standards:
   1. National Fire Protection Association / American National Standards Institute:
      a. NFPA 241, 'Standard for Safeguarding Construction, Alteration, and Demolition Operations', 2009 Edition.
   2. American National Standards Institute / American Society of Safety Engineers:
      a. ANSI / ASSE A10.6-2006, 'Safety Requirements for Demolition Operations.'

1.2 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.

1.3 SUBMITTALS

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

1.4 QUALITY ASSURANCE

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

1.5 FIELD CONDITIONS

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

PART 2 - PRODUCTS: Not Used

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification Of Conditions:
   1. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
      a. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.

B. Evaluation And Assessment:
   1. Hazardous Materials:
      a. It is not expected that hazardous materials will be encountered in the Work. Identified hazardous materials will be removed by Owner before start of the Work.
      b. If materials suspected of containing hazardous materials are encountered, do not disturb and immediately notify Architect.
   2. Inventory and record condition of items to be removed and reinstalled and items to be removed and salvaged.
   3. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure nature and extent of conflict. Promptly submit written report to Architect.
   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.
3. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, then remove masonry between saw cuts.

B. Removed and Reinstalled Items:
1. Clean and repair items to functional condition adequate for intended reuse.
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.

C. 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 1113

STRUCTURAL CAST-IN-PLACE CONCRETE FORMING

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Design, construction, and safety of formwork.
   2. Furnish and install required formwork ready for placing of concrete.
   3. Strip and dispose of formwork.

B. Related Requirements:
   1. Section 03 3111: 'Cast-In-Place Structural Concrete' for:
      a. Tolerances for placing structural concrete.
      b. Pre-installation conference held jointly with other concrete related sections.

1.2 REFERENCES

A. Reference Standards:
   1. American Concrete Institute:
      a. ACI 318-14, 'Building Code Requirements for Structural Concrete and Commentary'.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Pre-Installation Conference:
   1. Participate in pre-installation conference as specified in Section 03 3111.
   2. In addition to agenda items specified in Section 01 3100 and 31 3111, review following:
      a. Review Section 01 4523 for Testing and Inspection administrative requirements and responsibilities and Field Quality Control tests and inspections required of this section.
         1) Review requirements and frequency of testing and inspections.

B. Scheduling:
   1. Notify Testing Agency and Architect as directed in Section 03 3111.

1.4 SUBMITTALS

A. Informational Submittals:
   1. Manufacturer Instructions:
      a. Printed application instructions for form release agents.

PART 2 - PRODUCTS

2.1 COMPONENTS

A. Forms: Wood, metal, or plastic as arranged by Contractor:
   1. Forming material shall be compatible with specified form release agents and with finish requirements for concrete to be left exposed or to receive a smooth rubbed finish.

2.2 ACCESSORIES

A. Form Release Agents:
   1. Unexposed Surfaces Only: Contractor's option.

B. Expansion / Contraction Joints:
   1. 1/2 inch (13 mm) thick.
   2. Manufactured commercial fiber type:
      a. Meet requirements of ASTM D1751.
      b. Type Two Acceptable Products:
         1) Conflex by Knight-Celotex, Northfield, IL www.aknightcompany.com.
         2) Sealtight by W R Meadows Inc, Hampshire, IL www.wrmeadows.com.
         3) Equal as approved by Architect before installation. See Section 01 6200.
   3. Recycled Vinyl:
      a. Light gray color.
      b. Type Two Acceptable Products:
         1) Proflex by Oscoda Plastics Inc, Oscoda, MI www.oscodaplastics.com.
         2) Equal as approved by Architect before Installation. See Section 01 6200.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Forms:
   1. Assemble forms so forms are sufficiently tight to prevent leakage.
   2. Properly brace and tie forms.
   3. Make proper form adjustments before, during, and after concreting.
   4. Use new forms, or used forms that have been cleaned of loose concrete and other debris from previous concreting and repaired to proper condition. Use APA Plyform B-B Class I, or APA HDO Plyform B-B Class I, on exposed to view concrete that do not receive a smooth rubbed finish.

B. Accessories:
   1. General:
      a. Provide for installation of inserts, templates, fastening devices, sleeves, and other accessories to be set in concrete before placing.
      b. Position anchor bolts for hold-down anchors and columns and securely tie in place before placing concrete.
   2. Form Release / Finish Agents:
      a. Film thickness shall be no thicker than as recommended by Manufacturer.
      b. Allow no release / finish agent on reinforcing steel or footings.
   3. Expansion Joints:
      a. Install at joints between floor slab and foundation wall where shown on Drawings.

C. Form Removal (Slab on Grade):
   1. Removal of forms can usually be accomplished in twelve (12) to twenty-four (24) hours.
   2. If temperature is below 50 deg F (10 deg C) or if concrete (stairs, beams, etc) depends on forms for structural support, leave forms intact for sufficient period for concrete to reach adequate strength.
   3. For exposed to view surfaces that receive a smooth rubbed finish, remove forms while concrete is still “green”.
   4. Metal bars or prys should not be used. Use wood wedges, tapping gradually when necessary.

3.2 FIELD QUALITY CONTROL

A. Field Tests And Inspections:
   1. Concrete Formwork:

a. Inspections are not required and will be performed at discretion of Architect.

END OF SECTION

SECTION 03 1511

CONCRETE ANCHORS

PART 1 - GENERAL

1.1 SUMMARY

A. Products Furnished But Not Installed Under This Section:
   1. Cast-in place and post-installed concrete anchors including:
      a. Adhesive anchors for concrete.
      b. Expansion anchors for concrete.
      c. J-bolts and headed cast-in-place bolts.
      d. Screw anchors for concrete.
      e. Concrete anchors and inserts not specified elsewhere.
   2. Installer responsible when inspection results of concrete anchors require corrective actions.

B. Related Requirements:
   1. Section 01 1200: 'Multiple Contract Summary' for Owner Furnished Testing and Inspecting Services.
   2. Section 01 4523: ‘Testing and Inspecting Services’ for testing and inspection, and testing laboratory services for materials, products, and construction methods.
   3. Section 03 3111: ‘Cast-In-Place Structural Concrete’ for installation and inspection of cast-in-place anchors.
   4. Section 06 1100: 'Wood Framing' for installation of drilled in anchors.

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. 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’.
   3. ASTM International:
      a. ASTM A307-14, 'Standard Specification for Carbon Steel Bolts and Studs, 60 000 psi Tensile Strength’.
      b. ASTM A563-15, 'Standard Specification for Carbon and Alloy Steel Nuts’.
      c. ASTM A706/A706M-16, ‘Standard Specification for Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement’.
      d. ASTM F1554-15, ‘Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength’.
      e. 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'.
   4. International Code Council (IBC) (2015 or latest approved AHJ edition):
      a. IBC Chapter 17, ‘Structural Tests and Special Inspections’.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Scheduling:
   1. Inspection shall be performed according IBC requirements.
   2. Notify Testing Agency and Architect one week before installing anchors so inspection may be scheduled.

1.4 SUBMITTALS

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

B. Informational Submittals:
   1. Certificates:
      a. Adhesive Anchors:
         1) Installer to provide current ACI/CRSI certification to Architect prior to installation of anchors.
   2. Test And Evaluation Reports:
      a. Provide ESR for products used indicating conformance with current applicable ESR Acceptance Criteria.
   3. Manufacturer’s Instructions:
      a. Manufacturer's published installation recommendations for each item.
   4. Qualification Statements:
      a. All concrete anchors except Adhesive Anchors:
         1) Installer to provide record of installer installation training showing dates and those trained for all installed products when required when by Architect.

C. Closeout Submittals:
   1. Include following in Operations and Maintenance Manual specified in Section 01 7800:
      a. Record Documentation:
         1) Testing and Inspection Reports:
            a) Testing Agency inspection reports of all inspected anchors.

1.5 QUALITY ASSURANCE

A. Qualifications:
   1. Manufacturer:
      a. Having sufficient capacity to produce and deliver required materials without 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.
      b. Adhesive Anchors:
         1) Adhesive Anchors installed in horizontal to vertical overhead orientation to support sustained tension loads shall be installed by Certified Adhesive Anchor Installer (AAI) as certified through ACI/CRSI:
            a) Refer to most current version of ACI 318 for certification requirements.
            b) Proof of current certification shall be submitted to the Architect for approval prior to commencement of installation.
      c. All other Concrete Anchors:
         1) Arrange for manufacturer’s field representative to provide installation training for all products to be used, prior to commencement of work:
            a) Provide installation training when required by Architect.

B. Field Inspection:

1. Owner is responsible for Quality Assurance. Quality assurance performed by Owner will be used to validate Quality Control performed by Contractor.
2. Owner will provide Inspection for post-installed concrete anchors:
   a. Owner will employ testing agency to perform inspection for post-installed concrete anchors as specified in Field Quality Control in Part 3 of this specification:
      1) 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 and perform contractor testing and inspection.
      2) See Section 01 1200: 'Multiple Contract Summary'.

1.6 DELIVERY, STORAGE, AND HANDLING

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

B. Storage and Handling Requirements:
   1. Store materials protected from exposure to harmful weather conditions and as directed by Manufacturer.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Concrete Anchors:
   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 Contract Drawings.
      b. Install hot-dipped or stainless steel anchor bolts to attach wood sill plates to foundation with 1/4 inch by 3 inch x 3 inch minimum adjustable plate washers and standard cut washers between wood sill plates and nuts.
      c. Nut: Conform to requirements of ASTM A563, Grade A, Hex.
      d. 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:
      a. Conform to requirements of ASTM A307, Grade A or ASTM F1554 Grade 36 unless indicated otherwise on Contract Drawings.
   3. Cast-In-Place Anchor Bolts:
      a. J-Bolts:
         1) Non-headed type threaded 2 inches minimum conforming to requirements of ASTM F1554, Grade A.
         2) Anchor hook to project 2 inches minimum including bolt diameter.
      b. Headed Bolts:
         1) Headed type threaded 2 inches minimum conforming to requirements of ASTM F1554, Grade A.
   4. Reinforcing Bars:
      a. Composed of deformed carbon steel meeting requirements of ASTM A615/A615M, Grade 60.
   5. Adhesive Anchors:
      a. Products shall have current ESR conforming to current ICC Acceptance Criteria AC308 for concrete.
      b. Rod diameter and embedment length as indicated on Contract Drawings.
      c. Type Two Acceptable Products:
         1) HIT-RE 500V3 with SafeSet Epoxy Adhesive by Hilti Fastening Systems, Tulsa, OK www.us.hilti.com.
         2) Pure 110+ by Powers Fasteners Inc., Brewster NY www.powers.com.

3) SET-XP Epoxy by Simpson Strong-Tie Co., Pleasanton, CA www.simpsonanchors.com.
4) Equal as approved by Engineer before installation. See Section 01 6200.

6. Expansion Anchors:
   a. Products shall have current ESR conforming to current ICC Acceptance Criteria AC193 for concrete.
   b. Type Two Acceptable Products:
      1) KWIK Bolt TZ Expansion Anchor by Hilti Fastening Systems, Tulsa, OK www.us.hilti.com.
      2) Power-Stud +SD2 by Powers Fasteners Inc., Brewster NY www.powers.com.
      3) Strong-Bolt by Simpson Strong-Tie Co., Pleasanton, CA www.simpsonanchors.com.
      4) Equal as approved by Architect before installation. See Section 01 6200.
7. Screw Anchors:
   a. Provide anchors with length identification markings conforming to ICC Acceptance Criteria AC 193 for concrete.
   b. Type Two Acceptable Products:
      1) KWIK HUS-EZ by Hilti Fastening Systems, Tulsa, OK www.us.hilti.com.
      2) Wedge-Bolt+ by Powers Fasteners Inc., Brewster NY www.powers.com.
      3) Titen HD by Simpson Strong Tie Co, Pleasonton, CA www.simpsonanchors.com.
      4) 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:
      1) Exercise care in coring or drilling to avoid damaging existing reinforcing or embedded items.
      2) 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:
   a. Unless otherwise specified, do not drill holes in concrete until:
      1) Concrete has minimum age of 21 days at time of anchor installation.
      2) Concrete has achieved full design strength for load achievement.

3.2 PREPARATION

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

3.3 INSTALLATION

A. Post-Installed Anchors:
1. General:
   a. Drill holes with rotary impact hammer drills using carbide-tipped bits.
   b. Unless otherwise shown on Drawings, drill holes perpendicular to concrete surface.
   c. 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:
   1) Follow Manufacturer's recommendations to ensure proper mixing of adhesive components.
b. Adhesive:
   1) Inject adhesive into holes proceeding from bottom of hole and progressing toward surface so as to avoid introduction of air pockets into adhesive.
   2) Inject sufficient adhesive into hole to ensure that annular gap is filled to surface.
   3) Remove excess adhesive from surface and threads of anchor as necessary.
c. Shim anchors with suitable device to center anchor in hole. Do not disturb or load anchors before Manufacturer's specified cure time has elapsed.
d. Temperature:
   1) Observe Manufacturer's recommendations with respect to installation temperatures for adhesive anchors.
   2) Base material temperatures must be maintained above minimum temperatures allowed by Manufacturer for full required epoxy cure time.

3. Expansion Anchors:
   a. Protect threads from damage during anchor installation and prior to use.
   b. Set anchors to Manufacturer's recommended torque, using a 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 and prior to use.
   b. Set anchor flush, collared.
   c. Do not exceed Manufacturer's maximum allowed torque when seating anchor.

3.4 FIELD QUALITY CONTROL

A. Field and Inspections:
   1. Civil and structural field inspections are provided by Owner's independent Testing Agency as specified in Section 01 4523 'Testing And Inspection Services':
      a. Quality Control is sole responsibility of Contractor.
         1) Owner's employment of an independent Testing Agency does not relieve Contractor of Contractor's obligation to perform testing and inspection as part of his Quality Control:
            a) Testing and inspections, if performed by Contractor, will be responsibility of Contractor to be performed by an independent entity.
   2. Expansion Anchors / Adhesive Anchors / Screw Anchors:
      a. Certified Inspector from Testing Agency shall verify procedures used for installation of all concrete anchors and monitor their installation for compliance with Manufacturer's requirements.
      b. Inspections:
         1) Inspections shall include required verification and inspection of anchors as referenced in IBC Table 1704.4 and in accordance with most current version of ACI 318 or ACI 318M and applicable ASTM material standards that:
            a) The correct rod/anchor is used; size and type.
            b) The correct hole size is used and prepared per Manufacturer's instructions.
            c) That climactic conditions, and concrete temperature, allow for the anchors' installation and use.
            d) Proper hole cleaning equipment, per Manufacturer's instructions, is used.
            e) Torque applied to anchors does not exceed Manufacturer's allowable limits.
            f) Torque applied to anchors is per Manufacturer's instructions.

B. Non-Conforming Work:
   1. Contractor is to immediately notify Architect of incorrectly placed, misplaced or malfunctioning anchors and request instructions for corrective actions.

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 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 1200: 'Multiple Contract Summary' for Owner Furnished Testing and Inspecting Services.
   2. Section 01 4523: ‘Testing and Inspecting Services’ for testing and inspection, and testing laboratory services for materials, products, and construction methods.
   3. Section 03 1113: Structural Cast-In-Place Concrete Forming'.
   4. Section 03 2116: 'Epoxy-Coated Reinforcement Bars'.
   5. Section 03 3111: ‘Cast-In-Place Structural Concrete’ for:
      a. Reinforcement installed in concrete.
      b. Pre-installation conference held jointly with other concrete related sections.

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 ADMINISTRATIVE REQUIREMENTS

A. Pre-Installation Conferences:
   1. Participate in pre-installation conference as specified in Section 03 3111.
   2. In addition to agenda items specified in Section 01 3100, and Section 03 3111, review following:
      a. Installation scheduling and reinforcing placement.
      b. Review Section 01 4523 for Testing and Inspection administrative requirements and responsibilities and Field Quality Control tests and inspections required of this section.
         1) Review requirements and frequency of testing and inspections.

B. Scheduling:
   1. Notify Testing Agency and Architect as directed in Section 03 3053 and Section 03 3111.

1.4 SUBMITTALS

A. Action Submittals:
   1. Shop Drawings:
      a. Reinforcing placement drawings.

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

C. Closeout Submittals:
   1. Include following in Operations And Maintenance Manual specified in Section 01 7800:
      a. Record Documentation:
         1) Testing and Inspection Reports:
            a) Testing Agency Inspection Reports of reinforcement bars.

1.5 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.

C. Testing And Inspection:
   1. Owner is responsible for Quality Assurance. Quality assurance performed by Owner will be used to validate Quality Control performed by Contractor.
   2. Owner will provide Testing and Inspection for inspection of reinforcement bars:
      a. Owner will employ testing agencies to perform testing and inspection for inspection of reinforcement bars as specified in Field Quality Control in Part 3 of this specification:
         1) 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 and perform contractor testing and inspection.
         2) See Section 01 1200: ‘Multiple Contract Summary’.

1.6 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. Avoid cutting or puncturing vapor retarder during reinforcement placement and concrete operations.
   2. Clean reinforcement of loose rust and mill scale, earth, ice, and other materials which reduce or destroy bond with concrete.
   3. Blowtorch shall not be used to facilitate field cutting or bending or any other reinforcing work.
   4. 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. Accurately position, support, and secure reinforcement against displacement by formwork, construction, or concrete placement operations:
      a. Locate and support reinforcing by chairs, runners, bolsters, bar supports, spacers, or hangers, as required as recommended by 'ACI Detailing Manual, except slab on grade work.
      b. Support bars in slabs on grade and footings with specified bar supports around perimeter and at 4-1/2 feet on center each way maximum to maintain specified concrete cover.
      c. Install bar supports at bar intersections.
   3. Bend bars cold.

4. Dowel vertical reinforcement for formed concrete columns or walls out of footing or structure below with rebar of same size and spacing required above.
5. Securely anchor and tie reinforcement bars and dowels before placing concrete. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

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.
2. Concrete Structural System:
   a. In beams, slabs, and walls, avoid splices of reinforcement bars at points of maximum stress.
   b. Lap bars as follows:
      1) Compression Splices: 45 bar diameters minimum.
      2) Tension Splices: In accordance with ACI 318 Class B requirements.

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:
   a. Concrete not exposed to weather or in contact with ground:
      1) Slabs, walls, and joists:
         a) No. 14 and No. 18 bars: 1-1/2 inches (38 mm).
         b) No. 11 bars and smaller: 3/4 inches (19 mm).
      2) Beams and Columns:
         a) Primary reinforcement, ties, stirrups and spirals: 1-1/2 inches (38 mm).

3.2 FIELD QUALITY CONTROL

A. Field Tests And Inspections:
1. Civil and structural field tests, laboratory testing, and inspections are provided by Owner's independent Testing Agency as specified in Section 01 4523 'Testing And Inspection Services':
   a. Quality Control is sole responsibility of Contractor.
      1) Owner's employment of an independent Testing Agency does not relieve Contractor of Contractor's obligation to perform testing and inspection as part of his Quality Control:
         a) Testing and inspections, if performed by Contractor, will be responsibility of Contractor to be performed by an independent entity.
2. Reinforcement Bars:
   a. Testing Agency shall provide inspection for Reinforcement Bars. See Section 03 3111 for Testing and Inspection requirements.

END OF SECTION

SECTION 03 3111

CAST-IN-PLACE STRUCTURAL CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Furnish and install concrete work as described in Contract Documents including:
      a. Quality of concrete used on Project but furnished under other Sections.
      b. Concrete mix information and use of admixtures.
      c. Field Quality Control Testing and Inspection requirements for concrete.
      d. Pre-installation conference held jointly with other concrete related sections.
      e. Sealants and curing compounds used with concrete.
      f. Compact aggregate base for miscellaneous cast-in-place concrete.
      g. Miscellaneous cast-in-place concrete and equipment pads.

B. Products Installed But Not Furnished Under This Section:
   1. Concrete accessories.
   2. Inserts, bolts, boxes, templates, and fastening devices for other work, including those for bases only for Mechanical and Electrical.

C. Related Requirements:
   1. Section 01 1200: 'Multiple Contract Summary' for Owner Furnished Testing and Inspecting Services.
   2. Section 01 4523: ‘Testing and Inspecting Services’ for testing and inspection, and testing laboratory services for materials, products, and construction methods.
   3. Section 03 1113: ‘Structural Cast-In-Place Concrete Forming’.
   4. Section 03 1511: ‘Concrete Anchors and Inserts’.
   5. Section 03 2100: ‘Reinforcement Bars’.
   6. Section 03 2116: ‘Epoxy-Coated Reinforcement Steel Bars'.
   7. Section 05 1223: 'Structural Steel For Buildings' for:
      a. Furnishing of pipe for pipe bollards.
   8. Section 07 9213: 'Elastomeric Joint Sealant' for quality of sealants.
   9. Divisions 22, 23, And 26: Mechanical and electrical devices including boxes, conduits, pipes, hangers, inserts, and other work to be embedded in concrete work before placing.
   10. Furnishing of items to be embedded in concrete specified in Section involved.
   11. Owner will provide concrete leveling compounds and patching compounds required for carpet installation.

1.2 REFERENCES

A. Association Publications:
   1. American Concrete Institute, Farmington Hills, MI www.concrete.org. Abstracts of ACI Periodicals and Publications.
      a. Certifications:
         1) ACI CP-1(16), *‘Technical Workbook for ACI Certification of Concrete Field Testing Technician-Grade 1*’.
         2) ACI CP-10(10), *'Craftsman Workbook for ACI Certification of Concrete Flatwork Technician/Finisher'*.
         3) ACI CP-19(16), *‘Technical Workbook for ACI Certification of Concrete Strength Testing Technician’*.

B. Definitions:

1. Cold Weather, as referred to in this Section, is four (4) hours with ambient temperature below 40 deg F (4.4 deg C) in twenty-four (24) hour period.
2. Floor Flatness (F_F): Rate of change in elevation of floor over 12 inches (305 mm) section.
3. Floor Levelness (F_L): Measures difference in elevation between two points which are 10 feet (3.05 m) apart.
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 (12.9 kph) or greater.

C. Reference Standards:
1. American Association of State and Highway Transportation Officials:
   a. AASHTO M 153-06 (2016), 'Standard Specification for Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction'.
2. American Concrete Institute
   a. ACI 117-10 (R2015): 'Specifications for Tolerances for Concrete Construction and Materials and Commentary'.
   b. ACI 305.1-14, 'Specification for Hot Weather Concreting'.
   c. ACI 306.1-90 (R2002), 'Standard Specification for Cold Weather Concreting'.
   d. ACI 318-14, 'Building Code Requirements for Structural Concrete' (ACI 318) and 'Commentary on Building Code Requirements for Structural Concrete' (ACI 318R).
3. ASTM International:
   a. ASTM C31/C31M-15, 'Standard Practice for Making and Curing Concrete Test Specimens in the Field'.
   b. ASTM C33/C33M-16, 'Standard Specification for Concrete Aggregates'.
   c. ASTM C39/C39M-15a, 'Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens'.
   d. ASTM C94/C94M-16, 'Standard Specification for Ready-Mixed Concrete'.
   e. ASTM C140/C140M-16, 'Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units'.
   f. ASTM C143/C143M-15, 'Standard Test Method for Slump of Hydraulic-Cement Concrete'.
   g. ASTM C150/C150M-16, 'Standard Specification for Portland Cement'.
   h. ASTM C172/C172M-14a, 'Standard Practice for Sampling Freshly Mixed Concrete'.
   i. ASTM C173/C173M-16, 'Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method'.
   j. ASTM C192/C192M-16a, 'Standard Practice for Making and Curing Concrete Test Specimens in the Laboratory'.
   k. ASTM C231/C231M-14, 'Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method'.
   l. ASTM C260/C260M-10a, 'Standard Specification for Air-Entraining Admixtures for Concrete'.
   m. ASTM C330/C330M-14, 'Standard Specification for Lightweight Aggregates for Structural Concrete'.
   n. ASTM C494/C494M-15a, 'Standard Specification for Chemical Admixtures for Concrete.
   o. ASTM C496/C496M-11, 'Standard Test Method for Splitting Tensile Strength of Cylindrical Concrete Specimens'.
   p. ASTM C567/C567M-14, 'Standard Test Method for Determining Density of Structural Lightweight Concrete'.
   q. ASTM C595/C595M-16, 'Standard Specification for Blended Hydraulic Cements'.
   r. ASTM C618-15, 'Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete'.
   s. ASTM C1077-16, 'Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation'.
   t. ASTM C1157/C1157M-11, 'Standard Performance Specification for Hydraulic Cement'.
   u. ASTM D1751-04(2013), 'Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Types)'.
   v. ASTM E329-14a: 'Standard Specification for Agencies Engaged in Construction Inspection and/or Testing'.
   w. ASTM E1155-14, 'Standard Test Method for Determining F_F Floor Flatness and F_L Floor Levelness Numbers'.

4. International Code Council (IBC) (2015 or latest approved edition):
    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 ADMINISTRATIVE REQUIREMENTS

A. Pre-Installation Conference:
1. Participate in MANDATORY pre-installation conference as specified in Section 01 3100 and held jointly with following sections:
    a. Section 03 1113: 'Structural Cast-In-Place Concrete Forming'.
    b. Section 03 2100: ‘Reinforcement Bars’.
    c. Section 03 2116: ‘Epoxy-Coated Reinforcement Steel Bars'.
    d. Section 26 0526: 'Grounding And Bonding For Electrical Systems'.
2. Schedule pre-installation conference prior to placing of footings, installation of foundation forms and reinforcing steel, and installation of anchors, dowels, inserts, and block outs in foundation walls and slabs.
3. In addition to agenda items specified in Section 01 3100, review following:
    a. Set up concrete placement pour card system and verify that all relevant trades have signed off prior to concrete placement.
    b. Obtaining trade sign-offs on each pour card will be responsibility of General Contactor’s foreman or whoever is in charge of ordering concrete.
    c. Pour cards will be turned in to Quality Assurance representative after the work has been completed so that they can be reviewed and filed.
    d. Review installation scheduling, coordination, placement of building concrete, and placement of items installed in and under concrete.
    e. Review installation scheduling, coordination and placement of site concrete and of items installed in concrete.
    f. Review 'Verification of Conditions' requirements.
    g. Review requirements for preparation of subgrade and aggregate base requirements.
    h. Review formwork requirements.
    i. Review approved mix design requirements, mix designs and use of admixtures.
    j. Review reinforcing bar submittals.
    k. Review installation schedule and placement of reinforcing bars.
    l. Review placement, finishing, and curing of concrete, including cold and hot weather requirements.
    m. Review joint layout plan for control and expansion joints, fillers for sidewalks, curbs, and gutters:
        1) Review jointing requirements.
    n. Review smooth rubbed concrete finish procedures and requirements (applied immediately after removing concrete formwork while concrete is 'green').
    o. Review concrete slab tolerances and corrective measures if tolerances not met.
    p. Review safety issues.
    q. Review Section 01 4523 for Testing and Inspection administrative requirements and responsibilities and Field Quality Control tests and inspections required of this section.
        1) Review requirements and frequency of testing and inspections.

B. Scheduling:
1. Notify Testing Agency and Architect twenty-four (24) hours minimum before placing concrete.

1.4 SUBMITTALS

A. Action Submittals:
1. Joint layout plan for control and expansion joints for sidewalks, curbs, and gutters for written approval before starting work on this Section.

2. Shop Drawings:
   a. Show dimensioned locations of anchor bolts for hold-down anchors and columns.
   b. Show reinforcement and all necessary bending diagrams and reinforcing steel list, and construction joint locations.
   c. Provide bar schedules and bending details.
   d. Reinforced concrete walls shall be shown in scale elevation (scale at least one quarter inch to one foot). Details shall be in accordance with ACI rules.
   e. Show all formwork for concrete surfaces which are to remain exposed in the finished work.

B. Informational Submittals:
1. Certificates:
   a. Installers:
      1) Certification for National Ready Mixed Concrete Association (NRMCA).
      2) Certification for ACI-certified Flatwork Finishers and Technicians.
2. Design Data:
   a. Mix Design:
      1) Furnish proposed mix design to Architect for review prior to commencement of Work.
         a) Include density (unit weight) and void content determined per ASTM C1688/C1688M for fresh mixed properties and per ASTM C140/C140M for hardened concrete properties.
         b) Mix design shall show proposed admixture, amount, usage instructions, and justification for proposed use.
   b. Ready-Mix Supplier:
      1) Require mix plant to furnish delivery ticket for each batch of concrete. Keep delivery tickets at job-site for use of Owner or his representatives. Tickets shall show following:
         a) Name of ready-mix batch plant.
         b) Serial number of ticket.
         c) Date and truck number.
         d) Name of Contractor.
         e) Name and location of Project.
         f) Specific class or designation of concrete conforming to that used in Contract Documents.
         g) Amount of concrete.
         h) Amount and type of cement.
         i) Total water content allowed by mix design.
         j) Amount of water added at plant.
         k) Sizes and weights of sand and aggregate.
         l) Time loaded.
         m) Type, name, manufacturer, and amount of admixtures used.
         n) Design Data.
      2) Provide certificates with supporting testing reports verifying compliance with Contract Document requirements and that materials provided are from single source for following:
         a) Cement.
         b) Aggregate.
         c) Fly Ash.
3. Source Quality Control Submittals:
   a. Concrete mix design: Submit mix designs to meet following requirements:
      1) Mix Type B:
         a) Unexposed interior concrete slabs on grade.
         b) 3500 psi (24.13 MPa) minimum at twenty-eight (28) days.
         c) Water / Cementitious Material: 0.45 maximum by weight.
      2) Air Entrainment: Six (6) percent, plus or minus 1-1/2 percent for exterior concrete and foundation walls exposed to freeze/thaw cycles.
      3) Do not add water any time during mixing cycle above amount required to meet specified water / cement ratio. No reduction in amount of cementitious material is allowed.
   b. Slump:
      1) 4 inch (100 mm) slump maximum before addition of high range water reducer.
      2) 8 inch (200 mm) slump maximum with use of high range water reducer.
   c. Admixtures:

1) Mix design shall show proposed admixture, amount, usage instructions, and justification for proposed use. Do not use any admixture without Architect's written approval.
2) Fly ash: Amount of specified Class F (or Class C where Class F is not available) fly ash not to exceed twenty-five (25) percent of weight of cementations materials may used.
3) Chemical: Specified accelerator or retarder may be used if necessary to meet environmental conditions.
4) Chemical: Special additives to promote rapid drying concrete may be used in interior concrete slabs on grade if necessary to meet construction schedules.

C. Closeout Submittals:
1. Include following in Operations And Maintenance Manual specified in Section 01 7800:
a. Record Documentation:
1) Pour Reports:
a) Provide report that records following information:
b) Date and time of start of pour, Date and time of end of pour, and Date and time of end of finishing procedures.
c) Temperature at start of pour, Temperature at end of Pour, and Maximum temperature during performance of finishing procedures.
d) Wind speed at start of pour, Wind speed at end of pour, and Maximum wind speed during performance of finishing procedures.
e) Humidity at start of pour, Humidity at end of pour, and High and low humidity during performance of finishing procedures.
f) Cloud cover at start of pour, Cloud cover at end of pour, and High and low cloud cover during performance of finishing procedures.
g) Screeding method and equipment used.
h) Saw cut method and equipment used.
2) Testing and Inspection Reports:
a) Testing Agency Testing and Inspecting Reports of concrete.

1.5 QUALITY ASSURANCE

A. Qualifications: Requirements of Section 01 4301 applies, but is not limited to following:
1. Installers and Installation Supervisor:
a. ACI-certified Flatwork Technician and Finisher and a supervisor who is an ACI-certified Concrete Flatwork Technician.
2. Ready-Mix Supplier:
a. Comply with ASTM C94/C94M requirements and be certified according to NRMCA's 'Certification of Ready Mixed Concrete Production Facilities'.
3. Testing Agencies:
a. Independent agency qualified according to ASTM C1077 and ASTM E329.
1) Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technicians, Grade I according to ACI CP-1 or equivalent certification program.
2) Personnel performing laboratory tests shall be ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician - Grade I. Testing Agency laboratory supervisor shall be ACI-certified Concrete Laboratory Testing Technician - Grade II.

B. Testing And Inspection:
1. Owner is responsible for Quality Assurance. Quality assurance performed by Owner will be used to validate Quality Control performed by Contractor.
2. Owner will provide Testing and Inspection on concrete:
a. Owner will employ testing agencies to perform testing and inspection on concrete as specified in Field Quality Control in Part 3 of this specification:
1) 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 and perform contractor testing and inspection.
2) See Section 01 1200: ‘Multiple Contract Summary’.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Delivery And Acceptance Requirements:
   1. Expansion Joint Filler Material:
      a. Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.

B. Storage And Handling Requirements:
   1. Expansion Joint Filler Material:
      a. Store materials in a clean, dry area in accordance with manufacturer's instructions.
      b. Protect materials during handling and application to prevent damage.

PART 2 - PRODUCTS

2.1 SYSTEM

A. Manufacturers:
   1. Manufacturer Contact List:
      a. Aridus Admixture by US Concrete, Euless, TX www.us-concrete.com/aridus/.
      b. BASF (Construction Chemicals Division), Cleveland, OH www.master-builders-solutions.basf.us/en-us.
      c. Bonsal American, Charlotte, NC www.bonsal.com.
      d. Concure Systems Admixture by Concure Systems, Phoenix, AZ www.ConcureSystems.com.
      e. Dayton Superior Specialty Chemicals, Kansas City, KS www.daytonsuperiorchemical.com.
      f. Euclid Chemical Company, Cleveland, OH www.euclidchemical.com.
      g. Fritz-Pak Concrete Admixtures, Dallas, TX www.fritzpak.com.
      h. GCP Applied Technologies, Cambridge, MA www.gcpat.com/construction/en-us.
      i. L & M Construction Chemicals, Omaha, NE www.lmcc.com.
      j. Larsen Weldcrete by Larsen Products Corp, Rockville, MD www.larsenproducts.com.
      k. Sika Corporation, Lyndhurst, NJ www.sikaconstruction.com and Sika Canada, Pointe Claire, QC www.sika.ca.
      l. Unitex, Kansas City, MO www.unitex-chemicals.com.
      m. U S Mix Products Co, Denver, CO www.usspec.com.
      n. W R Meadows, Hampshire, IL www.wrmeadows.com.

B. Performance:
   1. Design Criteria: Conform to requirements of ASTM C94/C94M unless specified otherwise:
   2. Capacities:
      a. For testing purposes, following concrete strengths are required:
         1) At 7 days: 70 percent minimum of 28 day strengths.
         2) At 28 days: 100 percent minimum of 28 day strengths.

C. Materials:
   1. Hydraulic Cement: Meet requirements of ASTM C150/C150M.
      a. Meet requirements of ASTM C595/C595M.
      b. Meet requirements of ASTM C1157/C1157M.
   2. Aggregates:
      a. General:
         1) Submit a letter on quarry’s letterhead that certifies all aggregate for concrete complies with the requirements of this section. Material certificates which are submitted shall be signed by both the materials producer and the contractor, certifying that materials comply with or exceed requirements specified herein to the Architect, Civil and Structural Engineering Consultant and the Independent Testing Laboratory for review and approval.
         2) Aggregates for all concrete shall come from a quarry that is DOT approved and meets or exceeds durability Class I aggregate. The quarry shall submit a letter to Engineer

that certifies that all aggregate complies with DOT requirements for durability. Aggregate not meeting DOT durability requirements shall not be used.

b. Coarse:
   1) Meet requirements of ASTM C33/C33M or nonconforming aggregate that by test or actual service produces concrete of required strength and conforms to local governing codes.
   2) Aggregate shall be uniformly graded by weight.
c. Fine:
   1) Meet requirements of ASTM C33/C33M.
   2) Aggregate shall be uniformly graded by weight.

3. Water: Clear, apparently clean, and potable.
4. Admixtures And Miscellaneous:
   a. Fly Ash:
      1) Meet requirements of ASTM C618, Class F (or Class C where Class F is not available) and with loss on ignition (LOI) of three (3) percent maximum.
   b. Chemical:
      1) No admixture shall contain calcium chloride nor shall calcium chloride be used as an admixture. All chemical admixtures used shall be from same manufacturer and compatible with each other.
      2) Air Entraining Admixture:
         a) Meet requirements of ASTM C260/C260M.
         b) Type Two Acceptable Products:
            (1) Equal as approved by Architect before use. See Section 01 6200.
      3) Water Reducing Admixture:
         a) Meet requirements of ASTM C494/C494M, Type A and containing not more than 0.05 percent chloride ions.
         b) Type Two Acceptable Products:
            (1) Equal as approved by Architect before use. See Section 01 6200.
      4) Water Reducing, Retarding Admixture:
         a) Meet requirements of ASTM C494/C494M, Type D and contain not more than 0.05 percent chloride ions.
         b) Type Two Acceptable Products:
            (1) Equal as approved by Architect before use. See Section 01 6200.
      5) High Range Water Reducing Admixture (Superplasticizer):
         a) Meet requirements of ASTM C494/C494M, Type F or G and containing not more than 0.05 percent chloride ions.
         b) Type Two Acceptable Products:
            (1) Equal as approved by Architect before use. See Section 01 6200.
      6) Non-Chloride, Non-Corrosive Accelerating Admixture:
         a) Meet requirements of ASTM C494/C494M, Type C or E and containing not more than 0.05 percent chloride ions.
         b) Type Two Acceptable Products:
            (1) Equal as approved by Architect before use. See Section 01 6200.
      7) Corrosion Inhibiting Admixture:
         a) Liquid admixture to inhibit corrosion of steel reinforcement in concrete by introducing proper amount of anodic inhibitor. Admixture shall contain thirty (30) percent calcium nitrite solution and shall be used where called for in specifications or on drawings.
         b) Type Two Acceptable Products:
            (1) Eucon CIA by Euclid.
            (2) DCI or DCI-S by GCP Applied Technologies.
            (3) Equal as approved by Architect before use. See Section 01 6200.
      8) Alkali-Silica Reactivity Inhibiting Admixture:
         a) Specially formulated lithium nitrate admixture for prevention of alkali-silica reactivity (ASR) in concrete. Admixture must have test data indicating conformance to ASTM C1293.
         b) Type Two Acceptable Products:
            (1) Eucon Integral ARC by Euclid.
            (2) RASIR by W R Grace.
            (3) Equal as approved by Architect before use. See Section 01 6200.

9) Viscosity Modifying Admixture (VMA):
   a) Liquid admixture used to optimize viscosity of Self-Consolidating Concrete (SCC). Subject to compliance with requirements, provide following at dosage rates per manufacturer's recommendation.
   b) Type Two Acceptable Products:
      (1) Equal as approved by Architect before use. See Section 01 6200.
10) Shrinkage Reducing Admixture (SRA):
   a) Liquid admixture specifically designed to reduce drying shrinkage and potential for cracking.
   b) Type Two Acceptable Products:
      (1) Equal as approved by Architect before use. See Section 01 6200.
11) Rapid Drying Admixture in Interior Concrete Slabs on Grade:
   a) Admixture specifically designed to promote rapid drying of concrete.
   b) Type Two Acceptable Products:
      (1) Equal as approved by Architect before use. See Section 01 6200.

2.2 ACCESSORIES

A. Formwork:
   1. Meet requirements specified in Section 03 1113:

B. Bonding Agents:
   1. Type Two Acceptable Products:
      a. Acrylic Additive by Bonsal American.
      b. Day Chem Ad Bond (J-40) by Dayton Superior.
      c. Flex-Con by Euclid Chemical Co.
      d. Larsen Weldcrete by Larsen Products Corp.
      e. Everbond by L & M Construction Chemicals.
      f. MasterEmaco A 660 (formally Acryl 60) by BASF.
      g. U S Spec Multicoat by U S Mix Products.
      h. Intralok by W R Meadows.
      i. Equal as approved by Architect before use. See Section 01 6200.

C. Expansion Joint Filler:
   1. Expansion Joint Filler Material:
      a. Design Criteria:
         1) Resilient, flexible, non-extruding, expansion-contraction joint filler meeting requirements of ASTM D1751.
         2) 1/2 inch (12.7 mm) thick.
         3) Resilience:
            a) When compressed to half of original thickness, recover to minimum of seventy (70) percent of original thickness.
      b. Type Two Acceptable Products:
         1) Fiber Expansion Joint by W R Meadows, Hampshire, IL www.wrmeadows.com.
         2) Equal as approved by Architect before installation. See Section 01 6200.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification Of Conditions:
   1. Concrete Forms:
      a. Verify dimensions and spot elevations for locations of forms for concrete footings, stem walls, building slabs, curbs, gutters, walkways, and drainage systems are correct before concrete is placed.
         1) Notify Architect of incorrect dimensions or spot elevations in writing.

2) Do not place concrete until corrections are made and verified.

3.2 PREPARATION

A. Concrete Mixing:
1. General:
   a. All concrete shall be machine mixed.
   b. Water gauge shall be provided to deliver exact predetermined amount of water for each batch.
   c. Reliable system must be employed to insure that no less than predetermined amount of cement goes into each batch.
   d. Re-tempering partly set concrete will not be permitted.
2. Transit Mix:
   a. Transit mix concrete may be used provided it conforms to Specifications and tests herein described and ASTM C94/C94M.
   b. Central plant producing concrete and equipment transporting it are suitable for production and transportation of controlled concrete and plant is currently approved by local state DOT.
   c. Maximum elapsed time between time of introduction of water and placing shall be one (1) hour.
   d. Minimum time of mixing shall be one (1) minute per cubic yard after all material, including water, has been placed in drum, and drum shall be reversed for an additional two (2) minutes.
   e. Mixing water shall be added only in presence of Inspecting Engineer or inspector employed by Testing Agency.
   f. Trucks shall not be overloaded in excess of rated capacity as recommended by manufacturer.
3. Cold Weather Concreting Procedures:
   a. General Requirements:
      1) Materials and equipment required for heating and protection of concrete shall be approved and available at Project site before beginning cold weather concreting.
      2) Forms, reinforcement, metallic embedments, and fillers shall be free from snow, ice, and frost. Surfaces that will be in contact with newly placed concrete, including sub-grade materials, shall be 35 deg F (2 deg C) minimum at time of concrete placement.
      3) Thaw sub-grade 6 inches (150 mm) deep minimum before beginning concrete placement. If necessary, re-compact thawed material.
      4) Use no frozen materials or materials containing ice.
      5) See ACI 306.1 ‘Standard Specification for Cold Weather Concreting’ for additional requirements.
4. Hot Weather Concreting Procedures:
   a. General:
      1) Maximum concrete temperature allowed is 90 deg F (32 deg C) in hot weather.
      2) Cool aggregate and subgrades by sprinkling.
      3) Avoid cement over 140 deg F (60 deg C).
      4) Use cold mixing water or ice.
      5) Use fog spray or evaporation retardant to lessen rapid evaporation from concrete surface.
      6) See ACI 305.1 ‘Specification for Hot Weather Concreting’ for additional requirements.

B. Surface Preparation:
1. Earthwork Preparation:
   a. Aggregate base and subgrade:
      1) Prepare aggregate base as specified in Section 31 1123.
      2) Prepare natural soil subgrade as specified in Section 31 2213.
      3) Prepare fill subgrade as specified in Section 31 2323.
2. 23, and 26 shall be installed and inspected before placing concrete.
3. Install inserts, bolts, boxes, templates, pipes, conduits, and other accessories furnished under other Sections to be installed as part of work of this Section:
   a. Tie anchor bolts for hold-down anchors and columns securely to reinforcing steel.

C. Removal:
1. Remove water and debris from space to be placed:

3.3 INSTALLATION

A. Placing Concrete:
1. General:
a. Place as soon after mixing as possible.
b. Deposit as nearly as possible in final position.
c. No concrete shall be deposited in water.
d. Placing of concrete shall be continuous until panel or section is complete.
e. Compact concrete in forms by vibrating and other means where required.
1) Thoroughly consolidate concrete around reinforcing bars (Consolidation not required in concrete around reinforcing bars with Mix Type G).
2) Use and type of vibrators shall conform to ACI 309.
f. Form vertical surfaces full depth. Do not allow concrete to flow out from under forms in any degree into landscaped areas.
g. Consolidate concrete thoroughly.
h. Do not embed aluminum in concrete.
i. Do not use contaminated, deteriorated, or re-tempered concrete.
j. Avoid accumulation of hardened concrete.
k. Dusting with cement not permitted.
2. Foundation Walls: Leave steel projecting where required for floor tie.
3. Exterior Slabs:
a. For continuous placing and where shown on Drawings, saw cut one inch (25 mm) deep control joints before shrinkage occurs (2 inches at 6 inch slabs) (50 mm at 150 mm slabs).
4. Miscellaneous Concrete Elements:
a. Equipment Bases: Coordinate with appropriate Sections for locations and dimensions.
b. Light Pole Bases, Mow Strips, and Aprons:
1) Install bond breaker consisting of three (3) layers of 30 lb (13.6 kg) roofing felt between pole base and adjoining sidewalk, mow strip and building foundations, and aprons and building foundations.
c. Mow Strips and Aprons:
1) Aggregate base not necessary under mow strips and aprons.
2) Form and cast mow strips in place.
3) Set top of mow strip above finish grade as follows:
a) Sodded Areas: 2 inches (50 mm) below.
b) Seeded Areas: One inch (25 mm) below.
c) Ground Cover Areas: 2 inches (50 mm) below.
d) Trees and Shrub Areas (not individual trees): 4 inches (100 mm) below.
4) Compact topsoil underneath mow strips and aprons to density of undisturbed earth.
d. Pipe Bollards:
1) Install plumb and fill with concrete.
e. Sidewalks, Exterior Stairs, And Landings:
1) Slope with cross slope of 1/8 to 1/4 inch per ft (3 to 6 mm per 300 mm) (one to two percent) in direction of intended drainage.
2) Slope away from building 1/8 to 1/4 inch per ft (3 to 6 mm per 300 mm) (one to two percent) minimum.
3) Concrete walks shall be screeded to bring surface to grades and lines as indicated. Surface shall be floated with wood float with no coarse aggregate showing and then given broom finish before concrete sets.
5. Joints:
a. Control Joints (Contraction Joints):
1) Form control joints with early-entry, dry-cut saws as soon as final trowel operations are complete and joints can be cut without raveling.
2) Depth of control joints shall be approximately one quarter of concrete slab thickness, but not less than one inch (25 mm).
3) Control joints to be hand tooled in sidewalks, curbs and gutters, mow strips, and aprons.

4) Table One:

Concrete Control Joint On-Center Spacing (+/-)		
Sidewalks	4 feet to 6 feet	1.2 meters to 1.8 meters
Curbs and Gutters	10 feet	3.0 meters
Mow Strips	3 feet to 5 feet	0.90 meters to 1.50 meters
Flat Drainage Structures	10 feet	3 meters
Retaining Walls w/guardrails	Align with posts	
Retaining Walls w/chain link fencing	Align with posts	

b. Expansion Joints:
1) Expansion joints in Concrete Paving are specified in Section 32 1313.
2) Install so top of expansion joint material is 1/4 inch (6 mm) below finished surface of concrete.
3) No expansion joint required between curbs and sidewalks parallel to curb.
4) Provide expansion joints at ends of exterior site concrete elements that are perpendicular to and terminate at curbs, building foundations or other concrete elements (i.e. sidewalks, mow strips, aprons).
5) Provide expansion joints between sidewalks that are parallel, and adjacent, to storage building or main building.
6) Provide expansion joints around perimeter of concrete slab on grade at mechanical enclosure, around perimeter of slab on grade at dumpster enclosure and at top and bottom of exterior stairs.
7) Table Two:

Concrete Expansion Joint (Isolation) On-Center Spacing (+/-)		
Sidewalks, Curbs and Gutters	40 feet to 100 feet	12 meters to 30 meters
Mow Strips and Aprons	20 feet to 40 feet	6 meters to 12 meters
Flat Drainage Structures	50 feet	15 meters
Retaining Walls w/guardrails	36 feet	11 meters
Retaining Walls w/chain link fencing	50 feet	15 meters

8) Seal expansion joints as specified in Section 07 9213 for following areas:
a) Between entryway slabs and building foundations.
b) Between sidewalks and building foundations.
c) Within curbs and gutters.
d) Within flat drainage structures and at joints between flat drainage structures and other concrete elements.
9) Expansion joints are not required to be sealed for following areas:
a) Within aprons and where apron abuts sidewalks.
b) Within mow strips and where mow strip abuts building foundation and sidewalks.
c) Within sidewalks.

6. Bonding Fresh And Hardened Concrete:
a. Re-tighten forms.
b. Roughen surfaces.
c. Clean off foreign matter and laitance.
d. Wet but do not saturate.
e. Slush with neat cement grout or apply bonding agent.
f. Proceed with placing new concrete.
7. Anchor Bolts:
a. Place anchor bolts not tied to reinforcing steel immediately following leveling of concrete. Reconsolidate concrete around bolt immediately after placing bolt.
b. Do not disturb bolts during finishing process.

B. Finishing:
1. Interior Concrete Flatwork:
a. Screed Concrete.

b. Float Finish:
   1) Float as soon after screeding as possible.
   2) Consolidate surface with power-driven floats with exception of areas inaccessible to power-driven floats, which may be hand-floated.
   3) Re-straighten, cutting down high spots and filling low spots.
   4) Repeat float passes and re-straightening until surface has uniform, smooth, granular texture.

c. Trowel Finish:
   1) Steel trowel slab after concrete has set enough to avoid bringing water and fines to surface.
   2) Perform troweling with power-driven trowels with exception of areas inaccessible to power-driven trowels, which may be hand-troweled.
   3) Continue troweling passes and re-straightening with 10 foot (3 meter) highway straightedge until surface is free of trowel marks and uniform in texture and appearance.
   4) Apply burnished, burned-out trowel finish.

C. Curing:
1. Membrane Concrete Curing:
   a. As specified in Section 09 3923 'Membrane Concrete Curing'.
   b. Follow Manufacturer's written instructions for preparation, application rates, placement, and cleanup:

D. Tolerances:
1. General:
   a. Tolerances shall conform to requirements of ACI 117 or CSA A23.1/A23.2, except where specified differently:
      1) Floor test surfaces shall be measured and reported within seventy two (72) hours after completion of slab concrete finishing operations and before removal of any supporting shores to eliminate any curling effect F-numbers.
   b. Maximum Variation Tolerances:
      1) Table Three:

Maximum Variation Tolerances		
Thickness, standard	plus 3/8 inch, minus 1/4 inch	plus 9.5 mm, minus 3 mm
Thickness, footings	minus 0 inch	minus 0 mm
Plan, 0 - 20 feet	1/2 inch	12.7 mm
Plan, 40 feet or greater	3/4 inch	19 mm
Plan, footings	plus 1/2 inch	plus 12.7 mm
Eccentricity, footings	2 inch maximum standard, 1/2 inch at masonry	50 mm maximum standard, 12.7 mm at masonry
Openings, size	minus 1/4 inch, plus one inch	minus 6 mm, plus 25.4 mm
Openings, location	plus / minus 1/2 inch at center	plus / minus 12.7 mm at center
Plumb	1/2 inch maximum	12.7 mm maximum
Consecutive Steps, treads	1/4 inch	6 mm
Consecutive Steps, risers	1/8 inch	3 mm
Flight of Stairs, treads	1/4 inch in total run	6 mm in total run
Flight of Stairs, risers	1/8 inch in total height	3 mm in total height

2. Local Flatness / Levelness of Interior Slabs:
   a. Carpet and Tile Areas:
      1) Specified Overall Value of F_F25 / F_L20 and Minimum Local Value of F_F15 / F_L13 when tested in accordance with ASTM E1155.
      2) Specified Overall Value of F_F30 / F_L20 and Minimum Local Value of F_F18 / F_L13 when tested in accordance with ASTM E1155 in ceramic, resilient or vinyl tiled areas.
      3) Used on building slabs to be covered by carpet and tile as shown on Contract Drawings. Verify and coordinate with Finish Schedule.

4) Remedy For Out-of-Tolerance Building Slabs:
   a) Sections of building slabs which do not meet specified tolerances but are within ten (10) percent of specified tolerances, may be corrected by grinding or filling, at Owner's option.
   b) Remove and replace sections of slabs measuring outside specified correctable tolerances.
   c) Carpet areas: If floor leveling compounds or concrete patching compounds are required to bring floor into specified tolerances, they will be provided by Owner in conjunction with carpet installation and back-charged to Contractor.

b. Wood Flooring Areas:
   1) Specified Overall Value of F_F50 / F_L33 and Minimum Local Value of F_F30 / F_L20 when tested in accordance with ASTM E1155.
   2) Used on Cultural Hall building slabs as shown on Contract Drawings. Verify and coordinate with Finish Schedule.
   3) Remedy For Out-of-Tolerance Building Slabs:
      a) Sections of slabs to be covered by wood flooring, which do not meet specified tolerances but are within ten (10) percent of specified tolerances, may be corrected by grinding or filling, at Owner's option.
      b) Remove and replace sections of slabs measuring outside specified correctable tolerances.
      c) If floor leveling compounds or concrete patching compounds are required to bring floor into specified tolerances in wood flooring areas, they will be provided by Owner in conjunction with carpet installation and back-charged to Contractor.

3.4 FIELD QUALITY CONTROL

A. Field Tests And Inspections:
1. Civil and structural field tests, laboratory testing, and inspections are provided by Owner's independent Testing Agency as specified in Section 01 4523 'Testing And Inspection Services':
   a. Quality Control is sole responsibility of Contractor:
      1) Owner's employment of an independent Testing Agency does not relieve Contractor of Contractor's obligation to perform testing and inspection as part of his Quality Control:
         a) Testing and inspections, if performed by Contractor, will be responsibility of Contractor to be performed by an independent entity.
2. Reinforcement Bars and Bolts:
   a. Testing Agency shall provide inspections will include following:
      1) Bolts:
         a) Inspection of bolts to be installed in concrete prior to and during placement of concrete.
         b) Periodic inspection of anchors installed in hardened concrete.
      2) Reinforcement Bars:
         a) Periodic inspection of reinforcement bars and placement prior to concrete placement to verify grade, size, cover, spacing, and position of reinforcing.
         b) Inspect that all reinforcement bars are be positively identified as to heat number and mill analysis.
         c) Confirm surface of reinforcing bars is free of form release oil or other deleterious substances.
3. Concrete:
   a. Testing Agency shall provide testing and inspection for concrete as per ASTM C1077.
   b. Testing and inspections, if performed, will include following:
      1) Periodic inspection verifying use of required design mix.
      2) Inspection of reinforcing bars and anchor bolts before placement of concrete for proper installation.
      3) Inspection at time fresh concrete is sampled to fabricate specimens for strength tests, perform slump and air content tests, and determine temperature of concrete.
      4) Inspection of concrete placement for proper application techniques.
         a) Steel tools are not to be used on exterior concrete.
      5) Periodic inspection for maintenance of specified curing temperature and techniques:

a) Steel tools are not to be used on exterior concrete. Bull floating and finish floating is to be performed with magnesium or wood floats.

6) Periodic inspect of formwork for shape, location and dimensions of concrete member being formed:
   a) Certified Inspector shall inspect forms for general location, configuration, camber, shoring, sealing of form joints, correct forming material, concrete accessories, and form tie locations.
7) Periodic inspection of concrete finishing operations for proper finishing techniques.
8) Periodic inspection for placement of specified curing compounds.

c. Testing Agency will sample and test during placement of concrete as directed by Architect and may include following:
   1) Sampling Fresh Concrete: ASTM C172/C172M, except modified for slump to comply with ASTM C94/C94M:
      a) Slump: ASTM C143/C143M, test each time set of compressive specimens are made.
      b) Air Content: ASTM C173/C173M, volumetric method for lightweight or normal weight concrete: ASTM C231/C231M, pressure method for normal weight concrete each time set of compression test specimens are made.
      c) Concrete Temperature: Test each time set of compressive specimens are made.
      d) Unit Weight: ASTM C567/C567M, test each time set of compressive specimens are made.
   2) Concrete floor flatness and floor levelness of interior slabs as per ASTM E1155.
   3) Concrete moisture and alkalinity testing. See Section 09 0503 Flooring Substrate Preparation.

d. Compression Test Specimen: ASTM C31/C31M, one (1) set of four (4) standard cylinders for each compressive strength test, unless otherwise directed. Mold and store cylinders for laboratory cured test specimens except when field-cure test specimens are required.

e. Compressive Strength Tests: ASTM C39/C39M:
   1) Obtain one (1) composite sample for each day's pour of each concrete mixture exceeding 5 cu. yd (4 cu m), but less than 50 cu. yd (38 cu m), plus one (1) set for each additional 50 cu. yd (38 cu m) or fraction thereof.
   2) One (1) specimen tested at seven (7) days, two (2) specimens tested at twenty-eight (28) days, and one (1) specimen retained in reserve for later testing if required.
   3) If strength of field-cured cylinders is less than eighty-five (85) percent of companion laboratory-cured cylinders, evaluate current operations and provide corrective procedures for protecting and curing in-place concrete.
   4) Strength level of concrete will be considered satisfactory if averages of sets of three (3) consecutive strength test results equal or exceed specified compressive strength, and no individual strength test result falls below specified compressive strength by more than 500 psi (3.45 MPa).

f. Samples:
   1) Fresh Concrete: ASTM C172/C172M except modified for slump to comply with ASTM C94/C94M.
      a) Slump: ASTM C143/C43M, test each time set of compressive specimens are made.
      b) Air Content: ASTM C173/C173M, volumetric method for lightweight or normal weight concrete: ASTM C231/C231M, pressure method for normal weight.
      c) Concrete Temperature: Test each time set of compressive specimens are made.
      d) Unit Weight: ASTM C567/C567M, test each time set of compressive specimens are made.

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

3.5 CLEANING

A. General:

1. Curing:
   a. Clean tools, equipment as directed by Manufacturer's instructions.

3.6 PROTECTION

A. Concrete:
   1. Protect concrete that has not received its initial set from precipitation to avoid excess water in mix and unsatisfactory surface finish.
   2. Do not allow materials resulting from construction activities, which will affect concrete or application of finish floor systems adversely, to come in contact with interior concrete slabs.
   3. Protect interior concrete floors from stains, paint, mortar and other construction activities.

B. Curing:
   1. Restrict foot or vehicle traffic as curing membrane dries as recommended be Manufacturer.

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. Embedded Anchors for masonry.
   2. Post Installed Drilled Anchors for masonry:
      a. Adhesive anchors and inserts.
      b. Drilled-in mechanical anchors (expansion bolts).
      c. Screw anchors.
   3. Masonry anchors and inserts not specified elsewhere.

B. Related Requirements:
   1. Section 01 1200: 'Multiple Contract Summary' for Owner Furnished Testing and Inspecting Services.
   2. Section 01 4000: ‘Quality Requirements’ for administrative and procedural requirements for quality assurance and quality control.
   3. Section 01 4523: ‘Testing and Inspecting Services’ for post installed Drilled-In Anchor testing and inspection, and testing laboratory services for materials, products, and construction methods.
   4. Section 04 0501: ‘Common Masonry Requirements’ for installation of masonry anchors and inserts.
   5. Section 04 0521: ‘Masonry Veneer Ties’.
   6. Section 04 0523: ‘Masonry Accessories’.
   7. Sections Under 04 2000 Heading: ‘Unit Masonry’ for masonry anchors and inserts used in Unit Masonry.

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 355.4M-11, 'Qualification of Post-Installed Adhesive Anchors in Concrete and Commentary (Metric)'.
      c. ACI 548.12-12, 'Specification for Bonding Hardened Concrete and Steel to Hardened Concrete with an Epoxy Adhesive'.
   2. ASTM International:
      a. ASTM A36/A36M-14, ‘Standard Specification for Carbon Structural Steel’.
      b. ASTM A307-14, 'Standard Specification for Carbon Steel Bolts and Studs, 60000 psi Tensile Strength'.
      c. ASTM A563-15, ‘Standard Specification for Carbon and Alloy Steel Nuts'.
      d. ASTM E488/E488M-18, ‘Standard Test Methods for Strength of Anchors in Concrete Elements’.
      e. 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) (2018 or latest edition available):
      a. Chapter 17, ‘Special Inspections And Tests’:
         1) Section 1704, 'Special Inspections And Tests, Contractor Responsibility And Structural Observations'.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Pre-Installation Conference:
   1. Participate in MANDATORY pre-installation conference as specified in Section 01 3100 held jointly with other Division 04 'Masonry' specifications in this Project that require pre-installation conference as specified in Section 04 0501.

B. Scheduling:
   1. Inspection shall be performed according to Manufacturer's submitted ICC ES Evaluation Report.
   2. Notify Testing Agency and Architect twenty-four (24) hours minimum before testing Post Installed Drilled Anchors. Coordinate testing schedule with mortar and grout as specified in Section 04 0501.

1.4 SUBMITTALS

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

B. Informational Submittals:
   1. Test And Evaluation Reports:
      a. Post Installed Anchors:
         1) Provide current Manufacturer's applicable ICC ESR Evaluation Reports and ICC ES Acceptance Criteria showing conformance for each item.
   2. Manufacturer's Instructions:
      a. Post Installed Anchors:
         1) Manufacturer's published installation instructions for each item.

C. Closeout Submittals:
   1. Include following in Operations And Maintenance Manual specified in Section 01 7800:
      a. Record Documentation:
         1) Post Installed Anchors:
            a) Testing Agency Inspecting Reports of Anchors.

1.5 QUALITY ASSURANCE

A. Qualifications:
   1. Manufacturer:
      a. Having sufficient capacity to produce and deliver required materials without 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.

B. Testing and Inspection.
   1. Owner is responsible for Quality Assurance. Quality assurance performed by Owner will be used to validate Quality Control performed by Contractor.
   2. Owner will provide Testing and Inspection for Post Installed Anchors:
      a. Owner will employ testing agencies to perform testing and inspection for anchors as specified in Field Quality Control in Part 3 of this specification.
         1) 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 and perform contractor testing and inspection.
         2) See Section 01 1200: 'Multiple Contract Summary'.

1.6 DELIVERY, STORAGE, AND HANDLING

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

B. Storage And Handling Requirements:
   1. Store materials 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/F3125M for chemical, physical and mechanical requirements for quenched and tempered bolts manufactured from steel and alloy steel.

B. Embedded Anchor Bolts:
   1. Class Two Quality Standard. See Section 01 6200 for definition.
      a. Meet following design criteria requirements:
         1) Bent-bar Anchors: J and L-Bolts (threaded steel rods with hooks embedded into masonry):
            a) Non-headed type threaded 2 inches (50 mm) minimum conforming to material requirements of ASTM A36/A36M.
            b) Anchor hook to project 2 inch (50 mm) minimum including bolt diameter.
         2) Headed Bolts:
            a) Headed type threaded 2 inch (50 mm) minimum conforming to requirements of ASTM A307, Grade A.

C. Post Installed Anchors (Concrete Masonry Unit (CMS) and Hollow Brick Unit Masonry):
   1. Design Criteria:
      a. Design loads are determined from testing minimum of five (5) specimens in accordance with ASTM E488 under stresses and conditions that represent intended use.
         1) Allowable stress design values are limited to twenty (20) percent of average tested anchor bolt strength.
         2) Using strength design provisions, nominal design strengths are limited to sixty-five (65) percent of average tested strength.
      b. Effective embedment length: 2 inch (50 mm) minimum.
   2. 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 Contract 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.
   3. 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.

4. 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) Equal 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. Post Installed Anchors (Concrete Masonry Unit (CMS) and Hollow Brick Unit Masonry):
      a. Base Material Strength:
         1) Unless otherwise specified, do not drill holes in masonry until mortar, or grout has achieved full design strength.
      b. Identify position of reinforcing steel and other embedded items before drilling holes for anchors.
      c. Exercise care in coring or drilling to avoid damaging existing reinforcing or embedded items.
      d. Take precautions as necessary to avoid damaging, electrical and telecommunications conduit, and gas lines.
      e. Notify Architect/Engineer if reinforcing steel or other embedded items are encountered during drilling.

3.2 PREPARATION

A. Surface Preparation:
   1. Clean surfaces prior to installation.
   2. Prepare surface in accordance with Manufacturer's written instructions.

3.3 INSTALLATION

A. Embedded Anchor Bolts:
   1. Embed Headed and J Bolts larger than 1/4 inch (6.4 mm) diameter in grout that is placed in accordance with 'Grout Placement' as specified in Installation requirements in Part 3 of this specification. Anchor bolts of 1/4 inch (6.4 mm) diameter or less are permitted to be placed in grout.
   2. For anchor bolts placed in top of grouted cells and bond beams, maintain clear distance between bolt and face of masonry unit of at least 1/4 inch (6.4 mm) when using fine grout and at least 1/2 inch (12.7 mm) when using coarse grout.
   3. For anchor bolts placed through face shell of hollow masonry unit, drill hole that is tight-fitting to bolt or provide minimum clear distance:
   4. For portion of bolt that is within grouted cell, maintain clear distance between bolt and face of masonry unit and between head or bent leg of bolt and formed surface of grout of at least 1/4 inch (6.4 mm) when using fine grout and at least 1/2 inch (12.7 mm) when using course grout.
   5. Place anchor bolts with clear distance between parallel anchor bolts not less than nominal diameter of anchor bolt, nor less than 1 inch (25 mm).

B. Post Installed Anchors (Concrete Masonry Unit (CMS) and Hollow Brick Unit Masonry):
   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 Contract 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 instructions 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 instructions 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. Field Tests and Inspections:
   1. Civil and structural field tests, laboratory testing, and inspections are provided by Owner's independent Testing Agency as specified in Section 01 4523 'Testing And Inspection Services':
      a. Quality Control is sole responsibility of Contractor.
         1) Owner's employment of an independent Testing Agency does not relieve Contractor of Contractor's obligation to perform testing and inspection as part of his Quality Control:
            a) Testing and inspections, if performed by Contractor, will be responsibility of Contractor to be performed by an independent entity.
   2. Post Installed Anchors (Concrete Masonry Unit (CMS) and Hollow Brick Unit Masonry):
      a. Certified Inspector from Testing Agency shall verify procedures used for installation of all post installed anchors and monitor their installation for compliance with manufacturer's requirements.
      b. Testing: Ten (10) percent of each type and size of drilled-in anchor shall be proof loaded by Testing Agency's testing laboratory or as directed by Architect. Adhesive anchors will not be torque tested unless otherwise directed by Architect. If more than ten (10) percent of tested anchors fail to achieve specified torque or proof load within limits defined on Drawings, all anchors of same diameter and type as failed anchors shall be tested at Contractors expense, unless otherwise instructed by Architect.
         1) Torque will be applied with calibrated torque wrench.
         2) Proof loads will be applied with calibrated hydraulic ram. Displacement of adhesive anchors at proof load shall not exceed D/10, where D is nominal anchor diameter.

B. 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 06 0573

PRESERVATIVE WOOD TREATMENT

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Quality of wood preservative treatment where specified.

B. Related Requirements:
   1. Section 06 1100:
      a. Characteristics of wood to be pressure-treated.
      b. Furnishing and installing of pressure-treated wood.

1.2 REFERENCES

A. Definitions:
   1. Preservative-Treated Wood: Wood exposed to high levels of moisture or heat susceptible to decay by fungus and other organisms, and to insect attack. The damage caused by decay or insects can jeopardize the performance of the wood members so as to reduce the performance below that required. Preservative treatment requires pressure-treatment process to achieve depth of penetration of preservative into wood to verify that the wood will be resistant to decay and insects over time.
   2. Treated Wood: Wood impregnated under pressure with compounds that reduce its susceptibility to flame spread or to deterioration caused by fungi, insects, or marine bores.

B. Reference Standards:
   1. American Wood Protection Association:
      a. AWPA P5-10. 'Standard For Waterborne Preservatives'.
      b. AWPA P22-10. 'Standard For Ammoniacal Copper Zinc Arsenate (ACZA)'.
      c. AWPA P51-10, ‘Standard for Zinc Borate (ZB)’.
      d. AWPA T1-12, ‘Use Category System: Processing and Treatment Standard for Treated Wood’.
      e. AWPA U1-12, ‘Use Category System: User Specification for Treated Wood’.
   2. International Building Code (IBC) (2018 or most recent edition adopted by AHJ):
      a. Chapter 23, 'Wood':
         1) Section 2300, 'Minimum Standards and Quality':
            a) 2303.1, ‘General’:
               (1) 2303.1.8, 'Preservative-Treated Wood’.
         2) Section 2400, 'General Construction Requirements':
            a) 2304.11, ‘Protection Against Decay and Termites’:
               (1) 2311.2, 'Wood Used Above Ground’.
               (2) 2311.4, 'Wood In Contact With The Ground'.

1.3 SUBMITTALS

A. Informational Submittals:
   1. Certificate: Certificate of pressure treatment showing compliance with specification requirements and including information required under IBC Section 2303.1.8.1, ‘Identification’.

PART 2 - PRODUCTS

2.1 SYSTEMS

A. Manufacturers:
   1. Type One Acceptable Manufacturers:
      a. Arch Wood Protection Inc, Atlanta, GA www.wolmanizedwood.com.
      b. Hoover Treated Wood Products, Thomson, GA www.frtw.com.
      c. Osmose Inc, Griffin, GA www.osmose.com.
      d. U S Borax Inc, Valencia, CA www.borax.com/wood.
      e. Viance LLC, Charlotte, NC www.treatedwood.com.
      f. Equal as approved by Architect before bidding. See Section 01 6200.

B. Performance:
   1. Framing lumber grade and species shall be as specified in Section 06 1100 for particular use.
   2. Interior Wood In Contact With Concrete or Masonry:
      a. Preservatives:
         1) Disodium octoborate tetrahydrate (DOT / SBX) meeting requirements of AWPA U1 and with retention of 0.25 lbs per cu ft (4 kg per cu meter).
         2) Zinc borate meeting requirements of AWPA U1 and with retention of 0.17 lbs per cu ft (2.7 kg per cu meter).
         3) CCA-C (47.5 percent chromium trioxide, 18.5 percent copper oxide and 34 percent arsenic pentoxide) by Koppers Performance Chemicals, Griffin, Georgia, http://www.koppersperformancechemicals.com/ (0.25 lb/cu ft minimum retention).
         4) DURA-GUARD by Hoover Treated Wood Products, Thomson, GA www.frtw.com (.40 lb/cu ft minimum retention).
      b. Lumber: Treat in accordance with AWPA U1.
   3. Exterior Wood Continuously Exposed To Weather:
      a. Preservatives: Waterborne preservatives meeting requirements of AWPA U1 with retention levels as required by AWPA U1 for specific application.
      b. Lumber: Treat in accordance with AWPA U1.

PART 3 - EXECUTION: Not Used

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. ASTM International:
      a. ASTM A153/A153M-16a, ‘Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware’.
      b. ASTM D3498-18, ‘Standard Specification for Adhesives for Field-Gluing Plywood to Lumber Framing for Floor Systems’.
      c. ASTM F1667-18a, ‘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. Wood fastener list:
   a. Provide VMR Suppliers with wood fastener list.
2. 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.
3. 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.
4. 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. Products Installed But Not Furnished Under This Section:
   1. Glue-laminated structural units.
   2. Miscellaneous structural steel elements.
   3. Roof related blocking, wood nailers, and curbs.
   4. Structural composite lumber.
   5. Wood 'I' joists.
   6. Wood panel product sheathing.

C. Related Requirements:
   1. Section 05 1223: 'Structural Steel For Buildings' for furnishing of miscellaneous structural steel.
   2. Section 06 0573: 'Preservative Wood Treatment' for quality of preservative wood treatment.
   3. Section 06 1636: 'Wood Panel Product Sheathing' for:
      a. Pre-installation conference held jointly with Section 06 1100.
   4. Section 06 1712: 'Structural Composite Lumber - SCL'.
   5. Section 06 1733: 'Wood I Joists'.
   6. Section 06 1800: 'Glued-Laminated Construction'.
   7. Sections under 06 4000 Heading: 'Architectural Woodwork' for wall blocking requirements.
   8. Sections in Division 07: Roofing membranes for related blocking, wood nailers, and curbs.
   9. Section 08 4113: 'Aluminum-Framed Entrances And Storefronts':
      a. Pre-installation conference held jointly with Section 06 1100.

1.2 REFERENCES

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

B. Reference Standards:

1.3 ADMINISTRATIVE REQUIREMENTS

A. Pre-Installation Conference:
   1. Participate in MANDATORY pre-installation conference held jointly with Section 06 1636.
      a. Schedule pre-installation conference immediately before beginning framing work.
      b. In addition to agenda items specified in Section 01 3100, review following:
         1) Shear walls and struts.
         2) Nails and nailing requirements.
         3) Connections.
   2. Participate in pre-installation conference held jointly with Section 08 4113.
      a. In addition to agenda items specified in Section 01 3100, review following:

1) Rough opening requirements.

1.4 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.
2. Qualification Statements:
a. Alternate Supplier(s):
1) Provide name and contact information.
2) Provide Qualification documentation as requested.

1.5 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. Wood Framing List:
1. Provide Category Three Approved Suppliers with wood framing list.

B. 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).

C. 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.

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

E. See Contract 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.

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. Floors:
   1. Place with crown side up.
   2. Provide accurately fitted header and trimmer joists of same size as regular joists around floor openings, unless detailed otherwise, and support by steel joist hangers.
   3. Double joists under partitions that parallel run of joists.

E. Walls:
   1. Openings: Single, bearing stud supporting header and one adjacent (king) stud continuous between top and bottom plates, unless shown otherwise.
   2. Corners And Partition Intersections: Triple studs.
   3. Top Plates In Bearing Partitions: Doubled or tripled and lapped. Stagger joints at least 48 inches (1 200 mm).
   4. Stud Walls To Masonry. Use one of the following methods:
      a. Connect with 1/2 inch (13 mm) machine bolts 6 inches (150 mm) from top, 6 inches (150 mm) from bottom, and 48 inches (1 200 mm) maximum on center. Use three bolts minimum in height of 6 foot (1 800 mm) or higher wall.
      b. Secure wood to masonry using continuous 1/4 inch (6 mm) minimum bead of construction adhesive and powder actuated fasteners installed at 32 inches (800 mm) on center minimum.
   5. Firestops:

a. Horizontal or vertical concealed spaces in walls, light coves, soffits, drop ceilings, and other features over 10 feet (3 000 mm) in length or height, and at stairs, ceiling levels, floor levels, and other junctures of horizontal to vertical concealed spaces.
b. Within concealed spaces of exterior wall finishes and exterior architectural elements, such as trims, cornices or projections, at maximum intervals of 20 feet (6 000 mm), length or height.

6. Sill Plates:
   a. Shear Walls and Bearing Walls:
      1) Provide specified anchor 12 inches (300 mm) maximum and 4 inches (100 mm) minimum from each end of each plate.
      2) Shear Walls: Fasten with anchor bolts embedded in concrete or with screw anchors.
      3) Bearing Walls: Fasten with anchor bolts embedded in concrete, or with screw anchors or expansion bolts in drilled holes.
   b. Non-Structural Walls: Fasten with powder actuated fasteners.
   c. In addition to requirements of paragraphs 'a' and 'b' above, set sill plates of interior walls measuring less than 36 inches (900 mm) in length in solid bed of specified construction adhesive, except where sill sealer is used.
   d. Install specified seal sealer under sill plates of exterior walls of main building and of acoustically insulated interior walls.
   e. Masonry Wall Plates:
      1) Anchor 2x6 and 2x8 wall plates to top of block walls with 5/8 inch (16 mm) diameter anchor bolts at 32 inches (800 mm) on center unless noted otherwise.
      2) Set plates on masonry bearing walls true and level to provide full bearing. Use mortar as specified in Division 04 for leveling if leveling is required.
7. Posts And Columns:
   a. Unless shown otherwise, nail members of multiple member columns together with 16d at 6 inches (150 mm) on center from each side.
8. Beams And Girders:
   a. Built-Up Members:
      1) Stagger individual members of multiple span beams and girders so, over any one support, no more than half the members will have a joint. In all cases, however, joints shall occur over supports.
      2) Unless shown otherwise on Drawings, nail two-ply built-up members with 10d nails 12 inches (300 mm) on center top and bottom, staggered on opposite sides. Nail three-ply built-up members with 16d nails at 12 inches (300 mm) on center, top and bottom, staggered, on opposite sides. Set with crown edge up with full bearing at ends and intermediate supports.
   b. Pre-Fabricated Members:
      1) Solid glu-lam, LVL, LSL, or PSL members may be used in place of built-up 2x (38 mm) framing members. Size shall be same as built-up member.
      2) Solid LVL or PSL members may be used in place of built-up LVL members. Size shall be same as sum of built-up members.
   c. Wood shims are not acceptable under ends.
   d. Do not notch framing members unless specifically shown in Drawing detail.
9. Nailing:
   a. Stud to plate (coordinate with Contract Drawings):

2 by 4 inch nominal	38 by 89 mm	End nail, two 16d OR toe nail, four 8d
2 by 6 inch nominal	38 by 140 mm	End nail, three 16d OR toe nail, four 8d
2 by 8 inch nominal	38 by 184 mm	End nail, four 16d OR toe nail, six 8d
2 by 10 inch nominal	38 by 235 mm	End nail, five 16d OR toe nail, six 8d
1-3/4 by 5-1/2 inch LVL	44 by 140 mm LVL	End nail, three 16d OR toe nail, four 8d
1-3/4 by 7-1/4 inch LVL	44 by 184 mm LVL	End nail, four 16d OR toe nail, six 8d
1-3/4 by 9-1/4 inch LVL	44 by 235 mm LVL	End nail, five 16d OR toe nail, six 8d
1-3/4 by 11-1/4 inch LVL	44 by 286 mm LVL	End nail, six 16d OR toe nail eight 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.

F. 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. 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.
4. Installation of Wood Trusses:
a. Handle, erect, and brace wood trusses in accordance with TPI / WTCA Booklet BCSI.
b. Do not install damaged or broken wood trusses. Replace wood trusses that are broken, damaged, or have had members cut out during course of construction.
c. Do not set trusses until masonry bearing walls and masonry shear walls are complete.
d. Provide construction bracing for trusses in accordance with TPI DSB-89.
e. Provide continuous 2x4 horizontal web bracing as shown on truss shop drawings.
1) Secure bracing to each truss with two 10d or 16d nails.
2) Lap splice bracing by placing bracing members side by side on common web member. Butt splices are not acceptable.
f. Unless directed or shown otherwise, provide diagonal 2x4 bracing between trusses at each line of horizontal web bracing.
1) This diagonal bracing shall be continuous and extend from junction of web and top chord of one truss to junction of web and bottom chord of different truss.
2) Install bracing at approximately 45 degree angle. Bracing will extend over three trusses minimum or more as determined by height of trusses and 45 degree installation angle.
3) Install brace on side of web opposite horizontal web bracing and nail to each web with two 10d or 16d nails.
4) Install one brace every 20 feet (6.1 m) as measured from top of brace to top of next brace.
5. Installation of Glue-Laminated Structural Units:
a. Install work in accordance with Fabricators instructions and Glue-Lam Erection Safety Practices.
b. Adequately support and brace work until tied into building structure to insure against collapse due to wind or other forces.
c. Maintain protection of beams until roofing has been installed.
6. Installation of Structural Composite Lumber:
a. Install temporary horizontal and cross bracing to hold members plumb and in safe condition until permanent bracing is installed.
b. Install permanent bracing and related components before application of loads to members.
7. Installation of wood Web Joists:
a. Handle, erect, and brace sheathing wood web joists in accordance with Manufacturer's instructions.
b. Do not install damaged or broken wood web joists.
c. Install temporary horizontal and cross bracing to hold members plumb and in safe condition until permanent bracing is installed.
d. Cut holes through webs at locations or of sizes shown on Drawings and as recommended by Manufacturer.
8. Secure headers and header backing to structure as described in Contract Documents.

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

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

I. 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 1636

WOOD PANEL PRODUCT SHEATHING

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Furnish and install wood panel product sheathing required for walls, roofs, and floors as described in Contract Documents.

B. Related Requirements:
   1. Section 01 1200: 'Multiple Contracts Summary'.
   2. Section 01 4523: 'Testing and Inspecting Services' for testing and inspection, and testing laboratory services for materials, products, and construction methods.
   3. Section 06 1100: 'Wood Framing' for:
      a. Pre-installation conference held jointly with Section 06 1636.

1.2 REFERENCES

A. Association Publications:
   1. National Institute of Standards and Technology (NIST), U. S. Department of Commerce:
      a. Voluntary Product Standard DOC PS 1-09. 'Structural Plywood'.
      b. Voluntary Product Standard DOC PS 2-04. 'Performance Standard for Wood-Based Structural-Use Panels'.
   2. The Engineered Wood Association (APA), Tacoma, WA www.apawood.org.
      a. Performance Rated Panels, 'Product Guide' (for products bearing the APA trademark) December 2011.
      b. Voluntary Product Standard:
         1) PS 1-09. 'Structural Plywood'.
         2) PS 2-04. 'Performance Standard for Wood-Based Structural-Use Panels'.
      c. PRP-108 'Performance Standards and Policies for Structural-Use Panels'.
   3. TECO, Cottage Grove, WI www.tecotested.com.
      a. TECO PRP-133: ('Fire Rated Assemblies – OSB substitution for plywood in UL fire-rated assemblies that specify plywood).

B. Reference Standards:

1.3 ADMINISTRATIVE REQUIREMENTS

A. Pre-Installation Conference:
   1. Participate in pre-installation conference as specified in Section 06 1100.
   2. In addition to agenda items specified in Section 01 3100 and Section 06 1100, review following:
      a. Review Section 01 4523 for Testing and Inspection administrative requirements and responsibilities and Field Quality Control inspection required of this section.

B. Scheduling:
   1. Notify Testing Agency and Architect twenty-four (24) hours minimum before placing sheathing.

1.4 SUBMITTALS

A. Closeout Submittals:

1. Include following in Operations And Maintenance Manual specified in Section 01 7800:
    a. Record Documentation:
        1) Testing and Inspection Reports:
            a) Testing Agency Inspection Reports of sheathing.

1.5 QUALITY ASSURANCE

A. Qualifications:
    1. Suppliers:
        a. Licensed by American or Canadian Institute of Timber Construction, or American Wood Systems.

B. Testing and Inspection:
    1. Owner will provide Testing and Inspection for inspection of sheathing:
        a. Owner will employ testing agencies to perform inspection for sheathing as specified in Field Quality Control in Part 3 of this specification.
            1) 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 and perform contractor testing and inspection.
            2) See Section 01 1200: 'Multiple Contract Summary'.
        b. Owner's employment of an independent Testing Agency does not relieve Contractor of Contractor's obligation to perform testing and inspection as part of his Quality Control.
            1) Testing and inspections, if performed by Contractor, will be responsibility of Contractor to be performed by an independent entity.

1.6 DELIVERY, STORAGE, AND HANDLING

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

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

PART 2 - PRODUCTS

2.1 MATERIALS

A. Performance:
    1. Design Criteria:
        a. Meet requirements of PS 1, PS 2, or PRP-133 (TECO). Except where plywood is specifically indicated on Contract Drawings, oriented strand board (OSB) is acceptable.

B. Sheathing:
    1. Wood framing list:
        a. Provide Category Three Approved Suppliers with wood framing list.
    2. Sheathing:
        a. Sheathing shall bear grade stamp from American Plywood Association (APA) or equal grading organization.
        b. Sheathing shall not exceed 18 percent moisture content when fabricated or more than 19 percent when installed in Project.
        c. Sheathing 23/32 inch (18.3 mm) thick and thicker used for single-layer subflooring shall be tongue and groove.

d. Sheathing used for same purpose shall be of same thickness. In all cases, thickness specified is minimum required regardless of span rating.
e. Minimum span ratings for given thicknesses shall be as follows:

Thickness	Span Rating
3/8 inch	24 / 0
7/16 inch nominal	24 / 16
15/32 inch actual	32 / 16
1/2 inch nominal	32 / 16
19/32 inch actual	40 / 20
5/8 inch nominal	40 / 20
23/32 inch actual	48 / 24
3/4 inch nominal	48 / 24

2.2 ACCESSORIES

A. Nails:
1. As indicated on Contract Drawings.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General:
1. Top of nail heads shall be flush with sheathing surface.
2. Use of edge clips to provide spacing between sheathing panels is acceptable.

B. Wall Sheathing:
1. Spacing:
a. Provide 1/8 inch (3 mm) space between sheets at end and edge joints.
2. Edge Bearing And Blocking:
a. Panel edges shall bear on framing members and butt along their center lines.
b. Back block panel edges, which do not bear on framing members, with 2 inch nominal (45 mm) framing.
3. Nail Spacing:
a. As indicated on Contract Drawings.
b. Place nails not less than 3/8 inch (9.5 mm) in from edge.
4. Thickness:
a. As indicated on Contract Drawings.
5. Do not install any piece of wall sheathing with shortest dimension of less than 12 inches (300 mm).

C. Roof Sheathing:
1. Placing:
a. Lay face grain at right angles to supports. Provide blocking for support if framing turns at roof overhang.
b. Provide 1/8 inch (3 mm) space between sheets at end and side joints.
c. Stagger panel end joints.
d. Sheathing shall be continuous of two spans minimum.
2. Edge Bearing and Blocking:
a. As indicated on Contract Drawings.
3. Nail Spacing:
a. As indicated on Contract Drawings.
b. Place nails at least 3/8 inch (9.5 mm) in from edge.
4. Thickness:

a. As indicated on Contract Drawings.

5. Do not install any piece of roof sheathing with shortest dimension of less than 24 inches (600 mm) unless support is provided under all edges.

D. Floor Sheathing:
1. Floor Sheathing: 1 Layer Subflooring (floors accessible to public).
a. Apply bead of glue to structural supports. Lay face grain / strength axis across supports and with panel continuous over two supports minimum.
b. Allow expansion gap of at least 1/2 inch (12.5 mm) at walls.
c. Tongue and Groove.
d. Nail Spacing.
1) As indicated on Contract Drawings.
e. Thickness:
1) As indicated on Contract Drawings.
f. Do not install any piece of bottom layer floor sheathing with shortest dimension of less than 24 inches (600 mm).
2. Subflooring: 2 Layers Subflooring.
a. Bottom layer:
1) Glue subflooring layers together along lines of structural supports.
2) Leave 1/32 inch (1 mm) gap at side and end joints.
3) Nail as per floor sheathing nailing requirements.
4) Thickness:
a) 19/32 inch actual (15 mm) minimum thickness, except where specifically noted otherwise.
5) Do not install any piece of single layer floor sheathing with shortest dimension of less than 24 inches (600 mm).
b. Top layer:
1) Stagger joints of second layer subflooring so they do not line up with joints of first layer subflooring, but do align with intermediate structural member (for example, align with field nailing of bottom subflooring layer).
2) Glue subflooring layers together along lines of structural supports.
3) Leave 1/32 inch (1 mm) gap at side and end joints.
4) Nail at 6 inch (150 mm) centers on ends and 12 inch (300 mm) centers on intermediate structural members.
5) Thickness:
a) 19/32 inch actual (15 mm) minimum thickness, except where specifically noted otherwise.
6) Do not install any piece of single layer floor sheathing with shortest dimension of less than 24 inches (600 mm).

3.2 FIELD QUALITY CONTROL

A. Field Inspections:
1. Sheathing:
a. General:
1) Owner is responsible for Quality Assurance. Quality assurance performed by Owner will be used to validate Quality Control performed by Contractor.
2) Quality Control is sole responsibility of Contractor as specified in Section 01 4523 ‘Testing And Inspection Services’.
b. For walls and roof areas where nail spacing is 4 inches (100 mm) and less on center, Inspector shall verify wood panel sheathing, grade, thickness and nominal size of framing members, adjoining panel edges, nail size and spacing, bolting and other fastening of other components.

3.3 PROTECTION

A. Protect roof sheathing from moisture until roofing is installed.

END OF SECTION

SECTION 06 1712

STRUCTURAL COMPOSITE LUMBER: SCL

PART 1 - GENERAL

1.1 SUMMARY

A. Products Furnished But Not Installed Under This Section:
   1. Laminated Veneer Lumber (LVL).
   2. Parallel Strand Lumber (PSL).
   3. Laminated Strand Lumber (LSL).

B. Related Requirements:
   1. Section 06 1100: 'Wood Framing' for installation, securing, bracing, etc.

1.2 REFERENCES

A. Reference Standards:
   1. ASTM International:
      a. ASTM D2559-12a(2018), ‘Standard Specification for Adhesives for Structural Laminated Wood Products for Use Under Exterior Exposure Conditions'.
      b. ASTM D5456-18, ‘Standard Specification for Evaluation of Structural Composite Lumber Products'.

1.3 SUBMITTALS

A. Informational Submittals:
   1. Certificates: Provide certification confirming that material structural design properties and design stresses have met or exceed requirements shown on Drawings.
   2. Test And Evaluation Reports: Copies of ICC or CCMC reports showing approval materials.
   3. Qualification Statements:
      a. Alternate Supplier(s):
         1) Provide name and contact information.
         2) Provide Qualification documentation as requested.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Storage And Handling Requirements:
   1. Store members on job site in accordance with Manufacturer's instructions.
   2. Keep dry and provide supports to keep members off floor or ground.
   3. Split plastic wrappers of members stored encased in plastic on bottom side to allow for air circulation.

PART 2 - PRODUCTS

2.1 MANUFACTURED UNITS

A. Acceptable Manufacturers:
   1. Boise Cascade Corp, Boise, ID www.bc.com.
   2. Georgia-Pacific Corp, Atlanta, GA www.gp.com.

3. Jager Industries Inc, Calgary, AB www.jagerbuildingsystems.com.
4. Louisiana Pacific Corp, Portland, OR www.lpcorp.com.
5. Roseburg Forest Products, Roseburg, OR www.roseburg.com.
6. Trus Joist Corp, Div Weyerhaeuser, Boise, ID www.tjm.com or Surrey, BC (604) 588-7878.
7. Web Joist, Chehalis, WA www.webjoist.com.
8. Weyerhaeuser, Engineered Lumber Products, Boise, ID www.woodbywy.com.
9. Equal as approved by Architect before bidding. See Section 01 6200.

B. Design Criteria:
1. Materials shall be tested and evaluated in accordance with ASTM D5456.
2. Materials shall have current ICC-ES Evaluation Report, report approved by International Codes Council, or report issued by Architect approved model code evaluation service and shall comply with requirements of report.

C. Materials:
1. Members:
a. Identify materials by stamp or stamps indicating manufacturer's name, product trade name, grade, species (if applicable), evaluation report number, plant number, and name or logo of independent inspection agency.
2. Adhesive: Meet requirements of ASTM D2559.

D. Fabrication: Materials shall be manufactured in a plant evaluated for fabrication by governing code evaluation service and under supervision of third party inspection agency listed by governing code evaluation service.

PART 3 - EXECUTION: Not Used

END OF SECTION

SECTION 06 2024

DOOR, FRAME, AND FINISH HARDWARE INSTALLATION

PART 1 - GENERAL

1.1 SUMMARY

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

B. Products Installed But Not Furnished Under This Section:
   1. Flush wood doors.
   2. Finish hardware.

C. Related Requirements:
   1. Sections under 04 2000 heading: Grouting of frames installed in masonry walls.
   2. Section 08 1416: 'Flush Wood Doors'.
   3. Section 07 2116: ' Blanket Insulation' for quality of fiberglass insulation.
   4. Section 07 9213: ' Elastomeric Joint Sealants' for quality of sealants.
   5. Sections under 08 1000 heading: Furnishing of doors.
   6. Sections under 08 7000 heading: Furnishing of finish hardware.

1.2 ADMINISTRATIVE REQUIREMENTS

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

1.3 SUBMITTALS

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

1.4 DELIVERY, STORAGE, AND HANDLING

A. Delivery And Acceptance Requirements:
   1. Wood Doors:
      a. Do not have doors delivered to building site until after plaster, cement, and taping compound are dry.

b. If doors are to be stored at job-site for more than one week, seal top and bottom edges if not factory sealed.

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

PART 2 - PRODUCTS: Not Used

PART 3 - EXECUTION

3.1 INSTALLATION

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

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

C. Hardware:
1. General:

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

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

3.2 FIELD QUALITY CONTROL

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

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

3.3 CLOSEOUT ACTIVITIES

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

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 2001: 'Common Finish Carpentry Requirements' for Installation.
   2. Section 06 2210: ‘Miscellaneous Wood Trim’.
   3. Section 06 4512: ‘Architectural Woodwork Wood Trim’.
   4. Section 09 9324: ‘Interior Clear-Finished Hardwood’ for filling of nail holes and finishing.

1.2 REFERENCES

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

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

1.3 SUBMITTALS

A. Action Submittals:
   1. Product Data:
      a. Manufacturer's literature for specialty items and hardware not manufactured by Architectural Woodwork fabricator.
   2. Shop Drawings:
      a. 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.

1.6 WARRANTY

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

PART 2 - PRODUCTS

2.1 FABRICATORS

A. 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 4512

ARCHITECTURAL WOODWORK WOOD TRIM

PART 1 - GENERAL

1.1 SUMMARY

A. Products Furnished But Not Installed Under This Section:
   1. Casings, stops, handrails, and jambs.
   2. Chair rails.
   3. Hardwood trim for wall covering.
   4. 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 09 9324: ‘Interior Clear-Finished Hardwood’.

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.

1.4 WARRANTY

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

PART 2 - PRODUCTS

2.1 MATERIALS

A. 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. Design Criteria:
         1) Solid wood shall be plain sawn Red Oak.
         2) Paneling shall be panel product with plain sliced Red Oak veneer.
         3) Finish to match Owner selected sample as specified in Section 09 9324.
      b. Match existing Project Color Scheme:
         1) Control Sample provided by Owner:
            a) Control Sample will be existing wood item from Project.

2.2 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 6001

MISCELLANEOUS PLASTIC FABRICATIONS

PART 1 - GENERAL

1.1 SUMMARY

A. Products Furnished But not Installed Under This Section:
   1. Furnish window stools as described in Contract Documents.
   2.

B. Related Requirements:
   1. Section 06 2001: 'Common Finish Carpentry Requirements' for:
      a. Installation of Window Stools.
   2. Section 06 4001: 'Common Architectural Woodwork Requirements' for Approved Fabricators.

1.2 REFERENCES

A. Definitions:
   1. Solid Surface: Solid surface materials are manufactured from polymeric materials. Granules may also be added to enhance the color effects. Solid surface materials are non-porous and homogeneous, with the same composition throughout the thickness of the solid surface material. They are capable of being repaired, renewed to the original finish and fabricated into continuous surfaces with inconspicuous seams.

B. Reference Standards:
   1. American National Standards Institute/International Cast Polymer Alliance:
      a. ANSI/ICPA SS-1-2001, ‘Performance Standard for Solid Surface Materials'.

1.3 SUBMITTALS

A. Action Submittals:
   1. Product Data:
      a. Manufacturer's literature.
      b. Color selections.

PART 2 - PRODUCTS

2.1 ASSEMBLIES

A. Manufacturers:
   1. Acrylic Solid Surface:
      a. Category Four Approved Manufacturers. See Section 01 6200 for definitions of Categories.
         1) Corian by DuPont Co, Wilmington, DE. Contact Steve Finch at (314) 941-5179 or email stephen.m.finch@dupont.com.
         2) Staron Solid Surfacing by Cheil Industries / Samsung Chemical USA, La Mirada, CA www.staron.com.
         3) Hanex Solid Surfaces by Hanwha L&C Surfaces US HQ, Atlanta, GA www.hanwhasurfaces.com.
         4) LG Hi-Macs Solid Surfacing by LG Solid Source LLC, Peoria, AZ www.lgcreate.com.
         5) 'Gibralter Solid Surface' by Wilsonart International Inc, Temple, TX www.wilsonart.com.

B. Materials:
1. Acrylic Solid Surface Window Stools:
a. Design Criteria:
1) Meet requirements of ANSI/ICPS SS-1.
b. General:
1) 1/2 inch (12.7 mm) thick 100 percent acrylic polymer.
c. Approved Colors: As selected by Architect from Manufacturer's standard solid (white or off-white only) colors.
1) Glacier White by Corian.
2) Bisque by Corian.
3) Cameo White by Corian.
4) Vanilla by Corian.

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.

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

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. ASTM International:
a. ASTM C920-14a, 'Standard Specification for Elastomeric Joint Sealants'.
b. ASTM C1193-16, 'Standard Guide for Use of Joint Sealants'.
c. ASTM C1330-02(2013), 'Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid Applied Sealants'.
d. ASTM C1481-12(2017) 'Standard Guide for Use of Joint Sealants with Exterior Insulation & Finish Systems (EIFS)'.
e. ASTM D5893/D5893M-16, 'Standard Specification for Cold Applied, Single Component, Chemically Curing Silicone Joint Sealant for Portland Cement Concrete Pavements'.

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 joined.
c. Manufacturer's installation for removing existing sealants and preparing joints for new sealant.

1.5 QUALITY ASSURANCE

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

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

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 D5893/D5893M: Silicone Joint Sealant for Concrete Pavements.
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 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. General Interior Sealants:
a. General:
1) Inside jambs and heads of exterior door frames.
2) Both sides of interior door frames.
3) Inside perimeters of windows.
4) Miscellaneous gaps between substrates.
b. Design Criteria:
1) Meet ASTM C920, Type S, Grade NS, NT, and Class 25 test requirements.
2) 100 percent silicone sealant.
c. Non-Paintable Sealant (Installer Option A):
1) Category Four Approved Product. See Section 01 6200 for definitions of Categories:
a) Dow Corning: Tub, Tile, And Ceramic Silicone Sealant.
b) Laticrete: Latasil Silicone Sealant.
c) Momentive Performance Materials (formerly, GE Sealants & Adhesives): GE SCS2800 SilGlaze II Silicone Sealant.
d) Sherwin Williams: White Lightning Silicone Ultra Low Odor Window and Door Sealant.
e) Tremco: Tremsil 200 Silicone Sealant.
f) Franklin International: Titebond 2601 (White) 2611 (Clear) 100% Silicone Sealant.
d. Paintable Sealant (Installer Option B):
1) Category Four Approved Product. See Section 01 6200 for definitions of Categories:
a) Momentive Performance Materials (formerly, GE Sealants & Adhesives): GE SCS7000 Paintable Silicone Sealant.
3. Sealants For Interior Joints:
a. General:
1) Countertops and backsplash to wall.
2) Sinks and lavatories to countertops.
3) Joints between plumbing fixtures and other substrates.
b. Interior Ceramic Tile Joints are furnished in Section 07 9213 and installed in Section 09 3013 'Ceramic Tiling' including the following:

1) Ceramic tile inside corners.
2) Ceramic tile and paver tile joints.

c. Description:
1) One-part acetoxy cure silicone sealant with fungicides to resist mold and mildew.

d. Design Criteria:
1) Meet ASTM C920, Type S, Grade NS, NT, and Class 25 test requirements.
2) 100 percent silicone sealant.

e. Color: As selected by Architect from Manufacturer's standard colors.

f. Category Four Approved Products. See Section 01 6200 for definitions of Categories:
1) Dow Corning: Tub, Tile, And Ceramic Silicone Sealant.
2) Laticrete: Latasil Tile and Stone Silicone Sealant.
3) Momentive Performance Materials (formerly, GE Sealants & Adhesives): GE SCS1700 Sanitary Silicone Sealant.
4) Tremco: Tremsil 200 Silicone Sealant.

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. Builders Hardware Manufacturer's Association (BHMA) Hardware Functions:
      a. F75 Passage Latch: Latch bolt operated by lever from either side at all times.

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 21C**:
      a. 1 set: Smoke Gaskets.
      b. 1 each Closer with detent hold-open with cushion stop.
      c. 3 each: Hinges.
      d. 1 each: Latchset, Function F75.

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.

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 at the project site. Grind all welds smooth.
   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.
   2. Section 09 9324: ‘Interior Clear-Finished Hardwood’.

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. Book-Match: Matching between adjacent veneer leaves on one panel face. Every other piece of veneer is turned over so that the adjacent leaves are “opened” as two pages in a book. The fibers of the wood, slanting in opposite directions in the adjacent leaves, create a characteristic light and dark effect when the surface is seen from an angle.
   2. 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.
   3. 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.
   4. 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.
   5. 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.

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 C1036-16, '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.
   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:
   1. Source Quality Control Submittals:
      a. Samples:
         1) Interior Hardwood for Transparent Finish:
            a) Owner will provide Control Sample from project for finish.

C. 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:
         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. Factory Glazing (non-fire-rated openings):
a. Glazing: Tempered glazing meeting requirements of ASTM C1048, Kind FT, Condition A, Type I, Class I, Quality q3. Thickness 1/4 inch (6 mm).
b. Lite Kit:
1) Design Criteria:
a) Pre-finished wood or wood veneer frames.
2) Dimensions:
a) As shown on Drawings.
3) Category Four Approved Product. See Section 01 6200 for definitions of Categories:
a) Profile M6G by Graham.
b) Profile W6 by Marshfield.
c) Profile VT1 by VT Industries.

F. 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 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'.
   4. Section 08 4113: 'Aluminum-Framed Entrances and Storefronts' for storefront hardware.

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. 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.

2.2 FINISHES

A. Hardware Finishes:
   1. Match existing door hardware finishes in building.

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. Doors:
      a. Sizes:
         1) Non-Fire-Rated Doors:
            a) 1-3/4 inch 44.5 mm non-fire-rated wood doors in wood frames: 4 inches by 4 inches (100 mm by 100 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. Locksets and latchsets.

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. Locksets And Latchsets:
1. Design Criteria:
a. 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.

PART 3 - EXECUTION – Not Used

END OF SECTION

SECTION 08 7106

CLOSING DEVICES

PART 1 - GENERAL

1.1 SUMMARY

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

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

1.2 SUBMITTALS

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

1.3 WARRANTY

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

PART 2 - PRODUCTS

2.1 MANUFACTURED UNITS

A. Manufacturers:
   1. Category Four Approved Manufacturers. See Section 01 6200 for definitions of Categories:
      a. 7900 Series by Dorma Architectural Hardware, Reamstown, PA www.dorma.com/usa.
      b. 1461 Series by LCN Closers, Princeton, IL www.lcnclosers.com.
      c. 8501 Series by Norton Door Controls, Charlotte, NC www.nortondoorcontrols.com.
      d. 1431 Series by Sargent, New Haven, CT www.sargentlock.com.
      e. D-3550/D-3551 Series by Stanley, Indianapolis IN www.stanlesecuritysolutions.com.

B. Surface-Mounted Overhead Door Closers:
   1. Closers provided under this Section shall be from same Manufacturer.
   2. Provide parallel arms on closers unless door position in relation to adjacent wall requires otherwise. Provide covers.
   3. Closers shall have following features:
      1) Adjustable sweep speed.
      2) Adjustable backcheck.
      3) Non-handed, non-sized.
   4. Closer arm functions:
      a. Cushion stop. Identified as DS3 on the Door Schedule.
         1) LCN CUSH-N-STOP 1461-3077CNS.
         2) Equal approved by Architect prior to installation.
      b. Detent hold-open with cushion stop (identified as DS4 on the Door Schedule).

1) LCN HCUSH 1461-3049CNS.
2) Equal approved by Architect prior to installation.

c. Regular (identified as DS5 on the Door Schedule).
1) LCN Regular 1461-3077.
2) Equal approved by Architect prior to installation.

d. Friction hold-open (identified as DS6 on the Door Schedule).
1) LCN HEDA 1461-3049EDA.
2) Equal approved by Architect prior to installation.

e. Detent hold-open with spring and cushion stop (identified as DS7 on the Door Schedule).
1) LCN Spring HCUSH 1461-3049SCNS.
2) Equal approved by Architect prior to installation.

PART 3 - EXECUTION

3.1 INSTALLATION

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

B. Through-bolt hardware-to-door connections.

C. Mount closers to control degree of door swings as indicated on the Door Schedule.

3.2 ADJUSTING

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

END OF SECTION

SECTION 09 0503

FLOORING SUBSTRATE PREPARATION

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Coordination and scheduling of Owner Furnished Testing for Alkalinity and Concrete Moisture Testing of concrete slab as described in Contract Documents.
   2. Preparing floor substrate to receive flooring as described in Contract Documents.
   3. Remove existing carpet and prepare floor as described in Contract Documents.
   4. Perform building modifications and repairs to accommodate carpet and carpet base as described in Contract Documents.

B. Related Requirements:
   1. Pre-Installation conferences held jointly with Section 09 0503 as described in Administrative Requirements on Part 1 of this specification section.
   2. Section 01 1200: 'Multiple Contract Summary'.
   3. Section 01 3100: ‘Project Management and Coordination’ for pre-installation conference.
   4. Section 01 4000: ‘Quality Requirements’ for administrative and procedural requirements for quality assurance and quality control.
   5. Section 01 4301: ‘Quality Assurance – Qualifications’ establishes minimum qualification levels required.
   6. Section 01 4523: ‘Testing and Inspecting Services’ for testing and inspection, and testing laboratory services for materials, products, and construction methods.
   7. Section 01 7800: ‘Closeout Submittals’.
   8. Section 03 3111: 'Cast-In-Place Structural Concrete' for installation tolerances for concrete slabs.
   9. Section 09 6816: 'Sheet Carpeting'.

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. International Concrete Repair Institute: *'ICRI Concrete Slab Moisture Testing Program'* Rosemont, IL www.icri.org.
      a. ICRI Certification: 'Concrete Slab Moisture Testing Technician, Tier 2, Grade 1'.

B. Definitions (Following are specifically referenced for testing):
   1. Accreditation: Process in which certification of competency, authority, or credibility is presented. Verify that laboratories have an appropriate quality management system and can properly perform certain test methods (e.g., ANSI, ASTM, and ISO test methods) and calibration parameters according to their scopes of accreditation.
   2. Approved: To authorize, endorse, validate, confirm, or agree to.
   3. Field Quality Control: Testing, Inspections, Special Testing and Special Inspections to assure compliance to Contract Documents.
   4. Inspection/Special Inspection: Inspection of materials, installation, fabrication, erection or placement of components and connections requiring special expertise to ensure compliance with approved construction documents and referenced standards:
      a. Inspection: Not required by code provisions but may be required by Contract Documents.

   b. Special Inspection: Required by code provisions and by Contract Documents.
   c. Inspection-Continuous: Full-time observation of the Work requiring inspection by approved inspector who is present in area where the Work is being performed.
   d. Inspection-Periodic: Part-time or intermittent observation of the Work requiring inspection by approved inspector who is present in area where the Work has been or is being performed and at completion of the Work.
5. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform particular construction operation, including installation, erection, application, and similar operations.
6. Observation: Visual observation of building / site elements or structural system by registered design professional for general conformance to approved construction documents at significant construction stages and at completion. Observation does not include or waive responsibility for performing inspections or special inspections.
7. Owner's Representative: Owner's Designated Representative (Project Manager or Facilities Manager) who will have express authority to bind Owner with respect to all matters requiring Owner's approval or authorization.
8. Preconstruction Testing: Tests and inspections that are performed specifically for Project before products and materials are incorporated into the Work to verify performance or compliance with specified criteria.
9. Product Testing: Tests and inspections that are performed by testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with industry standards.
10. Moisture Vapor Emission Rate (MVER): Anhydrous Calcium Chloride (CaCl2) Moisture Vapor Emission Test was developed to quantify amount of moisture vapor emission from concrete slab.
    a. Test method to obtain quantitative value indicating rate of moisture vapor emission from concrete slab and if slab can receive floor covering by determination of rate of moisture vapor emitted from below-grade, on-grade, and above-grade (suspended) concrete floors.
    b. Moisture vapor emitted from concrete slab in measured in pounds which is equivalent weight of water evaporating from 1000 ft_2 of concrete surface in 24 hour period.
    c. Moisture vapor emission rate only reflects condition of concrete floor at time of test.
11. Outlier: Statistical observation or test data value which is far removed in value from others in the data set. An outlier may be an error in measurement which will distort interpretation of the data.
12. 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.
13. Quality Assurance: Testing, Inspections, Special Testing and Special Inspections provided for by Owner.
14. Quality Control: Testing, Inspections, Special Testing and Special Inspections provided for by Contractor.
15. Service Provider: Agency or firm qualified to perform required tests and inspections.
16. Source Quality Control Testing: Tests and inspections that are performed at source, i.e., plant, mill, factory, or shop.
17. Special Inspection: See Inspection.
18. Special Inspector: Certified individual or firm that implements special inspection program for project.
19. Special Test: See Test.
20. Test/Special Test: Field or laboratory tests to determine characteristics and quality of building materials and workmanship.
    a. Test: Not required by code provisions but may be required by Contract Documents.
    b. Special Test: Required by code provisions and by Contract Documents.
21. Testing Agency: Entity engaged to perform specific tests, inspections, or both.
22. Testing Agency Laboratory: Agency or firm qualified to perform field and laboratory tests to determine characteristics and quality of materials and workmanship.
23. Verification: Act of reviewing, inspecting, testing, etc. to establish and document that product, service, or system meets regulatory, standard, or specification requirements.

C. Reference Standards:
   1. ASTM International:
      a. ASTM F710-11, 'Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring'.
      b. ASTM F1869-11, 'Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride'.
      c. ASTM F2170-11, 'Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes'.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Pre-Installation Conference:
   1. Participate in pre-installation conference held jointly if possible for all related Division 09 6000 'Flooring' used for Project.
   2. Schedule conference after substrate preparation and before installation of flooring system. (If more than one (1) flooring system is included for project, hold conference at same time if schedule permits).
   3. Conference may be held at project site or other convenient site. Participants may also attend by video or audio conference if approved by Project Manager.
   4. In addition to agenda items specified in Section 01 3100, review following:
      a. Review condition of floor with regard to compliance with concrete installation tolerances and other work necessary to prepare floors for installation of flooring.
      b. Review Testing Agency testing report of Concrete Moisture of concrete:
         1) Installer may verify Concrete Moisture of concrete.
   5. Review condition of floor with regard to compliance with concrete installation tolerances and other work necessary to prepare floors for installation of flooring.
   6. Review additional agenda items all related flooring sections.

B. Scheduling:
   1. Concrete Moisture Testing:
      a. General Contractor Responsibility to provide:
         1) Maintain ambient temperatures and relative humidity conditions as specified in Field Conditions in Part 1 of this specification before Moisture Testing Agency will test for concrete moisture.
         2) Notify Owner to contact Moisture Testing Agency when building is enclosed and temperature and relative humidity meet requirements for testing.
         3) Provide access for and cooperate with Moisture Testing Agency.
      b. Owner's Representative Responsibility to provide:
         1) Provide following information to Moisture Testing Agency at time of notification:
            a) Digital copy of floor plan(s).
            b) Indicate different flooring material areas and which rooms on floor plan(s) and finish schedule requiring additional tests if required.
            c) Digital copy of Specification Section 09 0503 (this specification) from Contract Documents for this Project.
         2) Notify Moisture Testing Agency with 'Concrete Moisture Testing Request and Proposal' when building is enclosed and temperature and relative humidity meet requirements for testing:
            a) Moisture Testing dates are establish based on installation of carpet. To avoid testing 'green concrete' as much as possible, following schedule has been established for moisture testing:
               (1) Notification by Owner' Representative to Testing Agency to be at least SIXTY FIVE (65) days minimum before installation of Sheet Carpeting. Proposed moisture testing date will be between THIRTY (30) and THIRTY FIVE (35) of installation of carpet and identified on 'Concrete Moisture Testing Request and Proposal'.
               (2) Testing Agency has THIRTY (30) days to schedule moisture testing with Owner.

(3) Testing Agency has no more than FIVE (5) calendar days to complete Moisture Testing and issue 'Certified Moisture Testing Report'.
(4) 'Certified Moisture Testing Report' to be given to Owner's Representative no less than THIRTY (30) days minimum before installation of Sheet Carpeting.
(5) Owner's Representative to give Carpet Manufacture(s) 'Certified Moisture Testing Report' THIRTY (30) days before installation of carpet.

c. Testing Agency will provide Moisture Testing for following flooring areas:
1) Entrance Matting:
a) Moisture Testing for Module Matting Tile Flooring required.
b) Moisture Testing and Testing Report requirements specified in Informational Submittals.
c) See individual flooring section for additional scheduling requirements if required.
2) Sheet Carpeting:
a) Moisture Testing for Sheet Carpeting required.
b) Moisture Testing and Testing Report requirements specified in Informational Submittals.
c) See individual flooring section for additional scheduling requirements if required.

1.4 SUBMITTALS

A. Informational Submittals:
1. Certificates:
a. Concrete Slab Moisture Technician:
1) Provide current IFTI trained documentation and certified Field Technician certification. and/or
2) Provide current ICRI 'Concrete Slab Moisture Testing Technician, Tier 2, Grade 1' Certification.
b. Certified Standard Moisture Testing Report:
1) Report to include following:
a) Available to Testing Agency from Owner's Representative:
(1) Project Name.
(2) Property Number.
b) Test date.
c) Executive summary.
d) Certified Moisture and Alkalinity (pH) Test Report.
e) Project floor plan.
f) Project photographs including following information on each photograph:
(1) Site location.
(2) Test hole number.
(3) Serial number probe.
(4) Relative Humidity (RH), Alkalinity (pH) and temperature reading.
(5) Property number.
g) Outlier Test (As specified in Field Quality Control Testing in Part 3 of this specification:
(1) Note test as Outlier Test for which hole number was conducted.
(2) Site location.
(3) Test hole number.
(4) Serial number probe.
(5) Relative Humidity (RH), Alkalinity (pH) and temperature reading.
(6) Property number.
2) At completion of testing, Testing Agency shall submit Concrete Moisture Test Report for each flooring system included for project to following:
a) One (1) copy to Owner's Representative.
2. Special Procedure Submittals:
a. 'Concrete Moisture Testing Request and Proposal':
1) Provided by Owner's Representative for each project to Testing Agency:
a) Testing Agency to fill out form with following information and return as instructed:
(1) Review request information.

(2) Add information as requested.
(3) Sign form.
(4) E-mail form back to Owner's Representative.

b. Certified Moisture Testing Report Distribution:
1) Owner's Representative responsibilities after receiving Concrete Moisture Test Report:
a) Provide copies to following:
(1) One (1) copy to Architect.
(2) One (1) copy to Contractor.
(3) One (1) copy to Owner Furnished Carpet Manufacturer.
2) General Contractor responsibilities after receiving Concrete Moisture Test Report from Owner's Representative:
a) Provide copies to following:

c. Moisture Testing Report Instructions:
1) Carpet floor area testing for Alkalinity and Concrete Slab Moisture by Testing Agency Testing:
a) If 'any' Testing Agency's Special Procedure Submittal for RH concrete slab moisture testing results are ninety six (96) percent or more:
b) Testing pH at surface of concrete slab must be conducted in accordance with ASTM F 710 not to exceed 9 pH.
(1) If pH is equal to or less than 9, proceed with installation according to manufacturing installation guidelines and in accordance of Contract Documents.
(2) If pH exceeds 9 and manufacture recommended cure exceeds $500, contact Church Headquarters at carpet@ldschurch.org or call Carpet Contract Manager in Purchasing before proceeding with installation.

B. Closeout Submittals:
1. Include following in Operations And Maintenance Manual specified in Section 01 7800:
a. Record Documentation:
1) Testing and Inspection Reports:
a) Testing Agency Testing Reports of Alkalinity and Concrete Moisture testing.

1.5 QUALITY ASSURANCE

A. Testing and Inspection.
1. Owner will provide Field Testing for Alkalinity and Concrete Moisture of concrete slab before installation as specified in Field Quality Control in Part 3 of this specifications for flooring:
a. See Section 01 1200: 'Multiple Contract Summary'.
b. See Section 01 4523: 'Testing and Inspecting Services' for testing and inspection, and testing laboratory services for materials, products, and construction methods.
2. Category One VMR Testing Agency. See Section 01 6200 for definitions of Categories:
a. IFTI - Independent floor Testing & Inspection, Inc.:
1) Contact Information: James Pouliot:
a) 1850 Gateway Blvd. Suite 230 Concord, CA 94520.
b) Phone: Office (800) 490-3657 x 207 or Cell (925) 819-1780.
c) Fax (877) 814-0338.
d) E-mail james.pouliot@ifti.com.

B. Qualifications.
1. Concrete Slab Moisture Technician:
a. IFTI trained and certified Field Technician.
and/or
b. ICRI 'Concrete Slab Moisture Testing Technician, Tier 2, Grade 1' Certification:
1) Certification includes three (3) hour education session, written exam, and field testing performance exam based on ASTM standards.
2) Certification valid for period of five (5) years from date of testing completion.
c. Provide documentation.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Storage And Handling Requirements:
   1. Provide storage space and protection for flooring and installation accessories if materials are delivered before start of flooring installation.

1.7 FIELD CONDITIONS

A. Ambient Conditions:
   1. Testing conditions inside building shall be brought to same ambient temperature and relative humidity levels to be normal at occupancy of building (service conditions). Service conditions include normal levels of humidity, lighting, heating, and air conditioning:
      a. If service conditions are not possible, test conditions shall be 75 deg F (23.9 deg C) ± 10 deg F (minus 12.2 deg C) maintain relative humidity between forty (40) and sixty (60) percent in spaces to receive testing.
   2. Maintain these conditions forty eight (48) hours prior to, and during testing. Otherwise, results may not accurately reflect amount of moisture which is present in concrete slab or would normally be emitted from or through concrete slab during normal operating conditions.

B. Existing Conditions:
   1. If asbestos containing materials are suspected or discovered upon removing carpet, stop work and report to Architect and Owner's Representative before proceeding:
      a. Do not use solvents to wash substrate during abatement process.

PART 2 - PRODUCTS Not Used

PART 3 - EXECUTION

3.1 EXAMINATION

A. Evaluation And Assessment:
   1. Furniture:
      a. Examine pews, rostrum seating, and pianos to identify condition and anchorage system of each. Make written record of existing mars and damage to each piece to be removed and stored. If required by Architect, take photographs of each piece.
      b. Note positions of anchors to insure replacement of seating in original positions.

3.2 PREPARATION

A. Furniture Removal:
   1. Remove existing pews, rostrum seating, and pianos and store in location as directed by Owner.
   2. Protect stored furniture items from dust, dirt, and damage related to other installation activities.

B. Flooring Preparation:
   1. General:
      a. Prepare floor substrate in accordance with ASTM F710, 'Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring' (This standard is used for preparing concrete floors for all flooring).
         1) Required RH test and alkalinity test of concrete slab has been performed.
      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. Vacuum and damp mop floor areas to receive flooring before flooring installation.

2. Carpeted floor areas:
a. Prepare floor substrate in accordance with Carpet And Rug Institute (CRI) best practices to receive carpet installation and to provide installation that meets Carpet Manufacturer's warranty requirements.

C. Carpet Accessories:
1. Sundry items, such as adhesives, shall be conditioned to building ambient conditions before use.

3.3 FIELD QUALITY CONTROL

A. Field Tests:
1. General:
a. Owner is responsible for Quality Assurance. Quality assurance performed by Owner will be used to validate Quality Control performed by Contractor.
b. Quality Control is sole responsibility of Contractor as specified in Section 01 4523 'Testing And Inspection Services'.
2. Concrete Moisture and Alkalinity:
a. Testing Agency will test interior concrete slabs before installation of floor coverings as directed by Architect and will include following:
1) Interior concrete slab areas to be tested:
2) Standard Moisture Testing required of interior concrete slabs on grade:
a) General:
(1) Testing for concrete moisture shall be taken at concrete slab substrates scheduled to receive flooring as specified in Contract Drawings for complete flooring installation.
(2) Outlier Test: If one (1) test is abnormally different from other moisture tests, then additional test should be done. Outlier will be defined in this specification as moisture test that is at least fifteen (15) percent higher or lower than other tests at project building completed same day:
(a) Retesting should be done within 5 feet (1.50 m) feet of original test hole.
(b) Contact Owner's Representative for the need to outlier test and additional testing fees will apply.
(3) Include required tests for carpeting and additional tests at each different type of flooring system included for project.
(4) Carpet area moisture testing may be performed sooner than other flooring areas such as athletic flooring if included for Project, but should be tested at same time.
3) Concrete Moisture Test (test used with Standard Moisture and Comprehensive Moisture Testing if included for project). See Section 01 6200:
a) Relative Humidity (RH) testing using in-situ probes in accordance with ASTM F2170 testing requirements:
(1) Check calibration of measuring instrument.
(2) Building ambient conditions are met before testing.
(3) Drill Hole:
(a) Drill and prepare test holes as per ASTM F2170 (correct hole-depth and hole diameter are required).
(b) Drill holes equal to forty (40) percent of slab's thickness for concrete slabs on grade and twenty (20) percent of slab's thickness for suspended concrete slabs (hole must be perpendicular (90 deg) to surface).
(4) Clean Hole:
(a) Follow Manufacturer's installation instructions for cleaning holes and inserting sensor.
(5) Insert Sensor:
(a) Follow Manufacturer's installation instructions for inserting sensor.

(6) Readings:
(a) Follow Manufacturer's installation instructions for taking readings.
(b) Two (2) hours after installation of sensor, RH reading will be recorded. (Two (2) hour read is in lieu of the seventy two (72) hour ASTM standard)
(7) Future Testing:
(a) For future readings, replace protective cap by snapping it back into sensor.
(8) Test Report shall be submitted as specified in Informational Submittals in Part 1 of this specification.
(a) For future readings, replace protective cap by snapping it back into sensor.

b) Category Four Approved Products. See Section 01 6200 for definitions of Categories:
(1) Concrete moisture testing meter:
(a) Rapid RH 4.0 EX with Touch-n-Sense Technology and Rapid RH EX Smart Sensors by Wagner Meters, Rogue River, OR www.wagnermeters.com.

4) Alkalinity Testing (pH) Test:
a) Testing shall be performed in accordance with ASTM F710.
b) Test with pH meter or pH paper.
c) Testing shall be taken at every location and at each time concrete moisture test is performed at those locations.
d) Clean floor to remove all oil, dirt, dust and any floor coating or sealer.
(1) Lightly grind, sand, or bead blasting. Do not remove more than 1/8 inch (3 mm) of concrete.
(2) Removal of more than 1/8 inch (3 mm) may give high pH reading.
(3) Failure to remove laitance will produce low, inaccurate pH reading.
e) Place several drop of water on clean surface, forming puddle approximately 1 inch (25 mm):
(1) Allow puddle to set for sixty (60) ± five (5) seconds, then dip pH paper or meter into water.
(2) Remove immediately and record test result.
f) Testing to be performed concurrently with concrete moisture testing.
g) Test Report shall be submitted as specified in Informational Submittals in Part 1 of this specification.

END OF SECTION

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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 ADMINISTRATIVE REQUIREMENTS

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

1.4 SUBMITTALS

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

1.5 DELIVERY, STORAGE, AND HANDLING

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

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

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

1.6 FIELD CONDITIONS

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

PART 2 - PRODUCTS

2.1 MATERIALS

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

B. Materials:
1. Interior Gypsum Board:
   a. General:
      1) Size:
         a) Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.
      2) Class Two Quality Standard:Core: Fire-resistant rated gypsum core.
         a) Complies with Type X requirements of ASTM C1396/C1396M (Section 5).
         b) Surface paper: Face paper suitable for painting.
         c) Long edges: Tapered edge.
         d) 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. Furring Channels:
      1) Class Two Quality Standards. See Section 01 6200 for definitions:
         a) Walls: Galvanized DWFC-25.
         b) Ceilings: Galvanized DWFC-20.
      2) Accessories as required by Manufacturer's fire tests to provide necessary fire ratings.
   b. 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.
   c. Control Joint:
      1) Bent zinc sheet with V-shaped slot, perforated flanges, covered with plastic tape meeting requirements of ASTM C1047.
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.

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

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

PART 3 - EXECUTION

3.1 EXAMINATION

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

3.2 INSTALLATION

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

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

C. Mounting Accessories:
   1. Furring Channels: Apply with screws through flanges into each framing member.

D. 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.
1) Single Layer Application:
a) Stagger end joints:
(1) End and edge joints of board applied on ceilings shall occur over framing members or be back blocked with 2x4 (38 mm by 89 mm) blocking.
(2) Edge joints of board vertically applied on walls shall occur over framing members.
(3) 2x4 (38 mm by 89 mm) blocking is required at wall to ceiling transitions and at top of ceiling vault transitions.

2. 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.

3. 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.

4. 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 Under Acoustical Tile:
a) GA-214 Level 2: 'All joints and interior angles shall have tape embedded in joint compound and wiped with a joint knife leaving a thin coating of joint compound over all joints and interior angles. Fastener heads and accessories shall be covered with a coat of joint compound. Surface shall be free of excess joint compound. Tool marks and ridges are acceptable. Joint compound applied over the body of the tape at the time of tape embedment shall be considered a separate coat of joint compound and shall satisfy the conditions of this level.
b) Note: It is critical that gypsum board ceiling be smooth before installing ceiling tile. Drywall joints must be as specified in paragraph above.
2) Gypsum Board Surfaces to Receive: Wall Covering Type A - Section 09 7226: 'Sisal Wall Covering':
a) GA-214 Level 3: 'All joints and interior angles shall have tape embedded in joint compound and one additional coat of joint compound applied over all joints and interior angles. Fastener heads and accessories shall be covered with two separate coats of joint compound. All joint compound shall be smooth and free of tool marks and ridges. Coat prepared surface with specified wall covering primer'.
3) 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'.

3.3 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 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. Testing of Alkalinity and Concrete Moisture of concrete slab as specified in Section 09 0503 'Floor Substrate Preparation'.
      b. Pre-Installation Conference held in conjunction with Section 09 6813.
      c. Maintain Building Ambient Conditions including normal levels of humidity, lighting, heating, and air conditioning for acceptability for beginning floor preparation and carpet installation.
      d. Protection of carpet after installation of carpeting as required.

B. Related Requirements:
   1. Section 01 0000: 'General Requirements':
      a. Section 01 1200: Owner will furnish and install carpet tiles and carpet base. This Section establishes quality of materials and installation for information of Contractor, Architect, and Owner's Representatives.
      b. Section 01 3100: 'Project Management and Control'.
      c. Section 01 4000: 'Quality Requirements' for administrative and procedural requirements for quality assurance and quality control.
      d. Section 01 4301: 'Quality Assurance – Qualifications' for minimum qualification levels required.
      e. Section 01 4523: 'Testing and Inspecting Services' for testing and inspection, and testing laboratory services for materials, products, and construction methods.
      f. Section 01 7800: 'Closeout Submittals'.
   2. Section 09 0503: 'Flooring Substrate Preparation' for:
      a. Field Testing for Alkalinity and Concrete Moisture of concrete slab.
      b. Floor substrate preparation.
      c. Removal of furniture including pews and rostrum seating.
      d. Pre-installation conference for Sections under 09 6000 heading 'Flooring.

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 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. Backing Fabric: Fabric into which pile yarn is inserted, or reinforcing layer that is adhered to reverse side of fabric.
6. 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.
7. Carpet: Heavy fabric used to cover floor and made from variety of fibers.
8. Change In Surface Appearance: Cumulative change in surface appearance between unexposed and exposed specimens due to crushing, loss of tuft definition, and matting.
9. Colorfastness: Ability of fiber or carpet to retain color when exposed to (1) ultraviolet light, (2) crocking (wet or dry) and (3) atmospheric conditions.
10. Commercial Match: Matching of colors with acceptable tolerance, or with color variation that is barely detectable to naked eye.
11. 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.
12. Crushing: Collapsing of pile yarns, resulting in carpet matting and loss of resilience due to traffic.
13. Delamination: Form of deterioration of tufted carpet in which primary back and face yarns separate from secondary back.
14. Density: Amount of pile yarn per area of carpet or closeness of tufts. Higher density carpet improves resistance to crushing and matting.
15. Dimensional Stability: Ability of carpet to retain its size and shape once installed.
16. Face Weight: Total weight of face (above backing) yarns in carpet.
17. Fiber: Fundamental unit of carpet made from nylon, polyester, cotton, acrylics, wool, and recycled material.
18. Flammability: Procedures that have been developed for assessing flame resistance of carpets.
19. 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.
20. Fuzzing: Fluffy particles appear on carpet surfaces caused by fibers that loosen because of weak twist or snags.
21. Lightfastness: Degree of resistance of dyed textile materials to color destroying influence of sunlight.
22. Loss of Tuft Definition: Bursting, opening, and untwisting of pile yarn and/or decrimping of fibers in surface pile of pile yarn floor covering.
23. Matting: Loss of pile definition of a textile floor covering due to entanglement and compression of pile fibers.
24. 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.
25. Pile: Visible surface of carpet, consisting of yarn tufts in loop and/or cut configuration. Sometimes called face or nap.
26. 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.
27. Resilience: Ability of carpet to spring back to its original texture and thickness after being walked on or compressed weight of furniture.

28. Soil Resistance: Ability of carpet fiber to resist dry soil and maintain its original appearance after intermittent or restorative cleanings.
29. Soiling: Occurs when dirt particles build up in carpet fibers.
30. Stain Resistance: Ability of carpet fiber to resist absorption of stain and maintain its original appearance.
31. Texture: Visual and tactile surface characteristics of carpet pile, including such aesthetic and structural elements.
32. 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.
33. Tuft: Cluster of yarns drawn through fabric and projecting from surface in form of cut yarns or loops.
34. Tuft Bind: Force (usually measured in pounds) required to pull tuft from carpet backing.
35. Tufted Carpet: Carpet produced by tufting machine instead of loam.
36. Twist: Winding of yarn around itself. More twist improves carpet performance (especially in cut pile).
37. 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.
38. Woven: Interlacing strands of fiber into yarn forms woven carpet.
39. 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 carpet installation with other trades.

B. Pre-Installation Conference:
   1. Participate in pre-installation conference as specified in Section 09 0503.
   2. Schedule pre-installation conference before installation of flooring system.
   3. Conference may be held at project site or other convenient site. Participants may also attend by video or audio conference if approved by Project Manager.
   4. Schedule conference after substrate preparation and ONE (1) week before installation of flooring system.
   5. In addition to agenda items specified Section 01 3100 and Section 09 0503, review following:
      a. Review Testing Agency testing report of Alkalinity and Concrete Moisture of concrete slab.
         1) Follow Testing Agency report regarding Alkalinity and Concrete Moisture of concrete slab as specified in Section 09 0503 'Floor Substrate Preparation'.
      b. Review Owner's Representative schedule for furnishing and installation carpet.
      c. Review Flooring Manufacturer's installation conditions verification procedure and requirements.
      d. Review Building Ambient Conditions including normal levels of humidity, lighting, heating, and air conditioning for acceptability for beginning floor preparation and carpet installation.
      e. Review cleaning and disposal requirements.
      f. Review protection requirements of carpet after installation of carpeting.

C. Scheduling:
   1. Testing Agency to provide testing for Alkalinity and Concrete Moisture of concrete slab as specified in Section 09 0503 'Floor Substrate Preparation'.
   2. Notify Flooring Installer when Building Ambient Conditions requirements are met before installation of flooring system.
   3. Notify Owner's Representative to coordinate installation of carpet.

1.4 SUBMITTALS

A. 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 Preinstallation Meeting Agenda.
            d) Carpet Installation Notice to Proceed or Cancel.
            e) Carpet Inspection and Completion.
            f) Carpet Overage Report and Completion.
            g) Carpet Quotation Change Request.
         2) Owner to provide Testing Agency Testing Report of Alkalinity and Concrete Moisture testing for project.

B. 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 (7.620 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. Transport carpet in manner that prevents damage and distortion. Bending or folding individual carpet rolls or cuts from rolls is not recommended. When bending or folding is unavoidable for delivery purposes, carpet is required to be unrolled and allowed to lie flat immediately upon arrival at installation site.

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

1.7 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 'Floor Substrate Preparation'.
      2) Final determination as to whether or not 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 '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.
      2) Follow requirements specified in Section 09 0503 'Floor Substrate Preparation' before installation of carpet.

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 www.triddle@tandus.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: twenty-five (25) years minimum.
b) Seminary: twenty-five (25) 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:
      a. Carpet OPTION A (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) Sapphire '1':
               (1) Lees/Mohawk: Nauvoo II, 405 Bountiful II.
      b. Carpet OPTION B (based on moisture testing specified in Section 09 0503):
            a) Sapphire '1':
               (1) Lees/Mohawk: Nauvoo II, 405 Bountiful II.

(2) Tandus (formally CNA): Style 04346 Ensign, color Sapphire 86608.

c. Carpet OPTION C (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) Sapphire '1':
(1) Tandus (formally CNA): Style 04346 Ensign, color Sapphire 86608.

2. Carpet Base:
a. 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.

C. Floor Stoning:
1. Provide at bottom of Rostrum Ramp.
2. Provide at base plate for Rostrum Riser when located at Rostrum platform framing.

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 APPROVED INSTALLER

A. Same installer of Section 09 6816: 'Sheet Carpeting' shall install Section 09 6813: 'Tile Carpeting'.

3.2 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:
         1) Do not lay carpet over unsuitable surface. Commencing installation constitutes acceptance of floor and approval of existing conditions.
   2. Furniture:
      a. Examine pews, rostrum seating, and pianos to identify condition and anchorage system of each. Make written record of existing mars and damage to each piece to be removed and stored. If required by Architect, take photographs of each piece.
         1) Note positions of anchors to insure replacement of seating in original positions.

3.3 PREPARATION

A. Furniture Removal:
   1. Remove existing pews, rostrum seating, and pianos and store in location as directed by Architect.
   2. Protect stored furniture items from dust, dirt, and damage related to other installation activities.

B. 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.

3.4 INSTALLATION

A. Carpet:
   1. General:
      a. Install carpet and carpet base in accordance with 'CRI Carpet Installation Standard' and Manufacturer's written instructions supplied with product.
      b. Adhesion of carpet cushion (or secondary backing) to floor substrate and adhesion of carpet primary and secondary backings shall be continuous on floor surface so there are no bubble, ridges, or any separation of carpet from backings or backing from floor substrate caused by failure of carpet, backings or cushion, and adhesives as a system.
      c. Install carpet under edge of metal thresholds where possible. Use specified carpet accessories at exposed edges.
      d. Generally, install carpet on Rostrum first, Chapel second, Overflow third, and then remainder of building.
   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.
      f. Lay carpet lengthwise in Chapel and Cultural Hall.
      g. Lay carpet lengthwise on Rostrum, parallel to Rostrum seating.
      h. Carpet over Stairs must be laid in Manufactured roll sequence to coordinate with surrounding carpet on floors. Double fill and end seams should be avoided whenever possible.

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.

3.5 ACCESSORIES

A. Floor Stoning:
   1. Rostrum:
      a. Apply as recommended to bottom of Rostrum Ramp and/or Rostrum Riser base plate if shown on Rostrum platform framing when included on project.

3.6 FIELD QUALITY CONTROL

A. Field Tests:
   1. Carpeting:
      a. See Section 09 0503 'Flooring Substrate Preparation' for Field Testing for Alkalinity and Concrete Moisture of concrete slab.

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

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

a) Between nearest existing seams.
b) Between natural transition points or 12 feet (3.6 meters) of running length.

3.7 CLEANING

A. General:
1. Carpeting:
a. Carpet Installer's Responsibility:
1) Remove any soiling and/or staining from carpet.
2) Remove excessive adhesive with manufacturer recommended adhesive removers.
b. Stair Treads:
1) Carpet Installer's Responsibility:
a) Clean all exposed surfaces of stair treads of adhesive spatter before it sets in accordance with Manufacturer's cleaning instructions.

B. Damage to building:
1. Carpeting:
a. Carpet Installer's Responsibility:
1) Carpet Installer responsible for cleaning and repair of all damaged surfaces to their original condition from carpet installation.

C. Waste Management:
1. Contractor's Responsibility:
a. Provide adequate waste receptacles (dumpsters) and dispose of Owner Furnished materials from building and property as specified in Section 01 7400.
2. Carpet Installer's Responsibility:
a. All work areas are to be kept clean, clear and free of debris at all times.
b. Disposal of rubbish, wrapping paper, scraps, and trimmings in provided dumpster(s).

3.8 PROTECTION

A. Protection of Carpeting:
1. Contractor'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 adequately from soil, dust, moisture and other contaminants after carpet installation.
d. Protect carpet from abuse, vandalism, or damage occurring after installation is complete.

END OF SECTION

SECTION 09 7226

SISAL WALL COVERING

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Furnishing and installing wall covering 'Type A' (Sisal) as described in Contract Documents.

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

1.2 REFERENCES

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

B. Reference Standards:
   1. ASTM International:
      a. ASTM E84-14, ‘Standard Test Method for Surface Burning Characteristics of Building Materials'.
   2. 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) 803.1.3, ‘Room Corner Test for Textile Wall Coverings and Expanded Vinyl Wall Coverings’.
            c) 803.1.4, ‘Acceptance Criteria for Textile and Expanded Vinyl Wall Coverings Tested to ASTM E84 or UL 723’.
   3. 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’, (2011 Edition).
   4. Underwriters Laboratories, Inc.:
      a. UL 723: ‘Standard for Safety Test for Surface Burning Characteristics of Building Materials'; (2010 - Tenth Edition).

1.3 SUBMITTALS

A. Action Submittals:
   1. Product Data:
      a. Manufacturer's literature or cut sheet.

b. Maintenance instructions.
c. Color and pattern selection.

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

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

1.4 QUALITY ASSURANCE

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

B. Qualifications:
1. Installer: Requirements of Section 01 4301 applies, but not limited to following:
a. Minimum three (3) years experience in wall covering installations.
b. Minimum five (5) years satisfactorily completed projects of comparable quality, similar size, and complexity in past three (3) years before bidding.
c. Agree to view DVD titled ‘No-Flame Sisal Wall Covering Recommended Installation Procedures’ provided by Owner. This may be waived by Owner, if Installer has viewed DVD before or can document at least two (2) satisfactorily completed projects of comparable size using sisal wall coverings in past three (3) years before bidding.
d. Upon request, submit documentation.

1.5 DELIVERY, STORAGE, AND HANDLING

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

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

1.6 FIELD CONDITIONS

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

1.7 WARRANTY

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

PART 2 - PRODUCTS

2.1 MANUFACTURERS

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

2.2 DESCRIPTION

A. Colors:
   1. Category Four Approved Products. See Section 01 6200 for definitions of Categories.
      a. Match existing color.

2.3 MATERIALS

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

2.4 ACCESSORIES

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

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

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification Of Conditions:
   1. Examine substrate and verify that it is suitable for installation of sisal wall covering.
   2. Notify Architect of unsuitable conditions in writing.
      a. Do not install over unsuitable conditions.
   3. Commencement of Work by installer is considered acceptance of substrate.

3.2 INSTALLATION

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

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

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

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

E. At edges of sisal that are not covered with a wood trim rabbet, install a continuous bead of clear silicon sealant at the exposed sisal edges.

END OF SECTION

SECTION 09 9001

COMMON PAINTING AND COATING REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

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

B. Related Requirements:
   1. Section 07 9213: 'Elastomeric Joint Sealants' for quality of Elastomeric Joint Sealants.
   2. Sections under 09 9000 heading ‘Paints and Coatings’.
      a. Pre-Installation conferences held jointly with Section 09 9001.

1.2 REFERENCES

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

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

   3. Properly Painted Surface:
      a. Surface that is uniform in appearance, color, and sheen and free of foreign material, lumps, skins, runs, sags, holidays, misses, strike-through, and insufficient coverage. Surface free of drips, spatters, spills, and overspray caused by Paint Applicator. Compliance will be determined when viewed without magnification at a distance of 5 feet (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 ADMINISTRATIVE REQUIREMENTS

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

1.4 SUBMITTALS

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

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

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

D. Maintenance Materials Submittals:
   1. Extra Stock Materials:

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

1.5 QUALITY ASSURANCE

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

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

1.6 DELIVERY, STORAGE, AND HANDLING

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

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

1.7 FIELD CONDITIONS

A. Ambient Conditions:
1. Perform painting operations at temperature and humidity conditions recommended by Manufacturer for each operation and for each product for both interior and exterior work.
2. Apply painting systems at lighting level of 540 Lux (50 foot candles) minimum on surfaces to be painted.
a. Inspection of painting work shall take place under same lighting conditions as application.
b. If painting and coating work is applied under temporary lighting, deficiencies discovered upon installation of permanent lighting will be considered latent damage as defined in MPI Manual, PDCA P1-92.

PART 2 - PRODUCTS

2.1 SYSTEMS

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

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. Wood trims. Back prime wood elements to be installed against concrete or masonry or that may be subjected to moisture.

C. Apply sealant in gaps 3/16 inch (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 9123 'Interior Painted Gypsum Board-Plaster'.
   2. Section 09 9124 ‘Interior Metal’.
   3. Section 09 9324 'Interior Clear-Finished Hardwood'.

B. Colors:
   1. Interior:
      a. Class One Color Quality Standards. See Section 01 6200:
         1) Interior Clear Finished Wood (See Section 09 9324):
            a) Match other interior clear finished wood building elements.
         2) Interior Gypsum Board, Plaster (See Section 09 9123):
            a) Verify to match existing.
         3) Interior Metal (See Section 09 9124):
            a) Verify to match existing.

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 and existing interior gypsum board and plaster surfaces as described in Contract Documents.

B. Related Requirements:
   1. Section 09 2900: 'Gypsum Board' for:
      a. Priming new and existing interior gypsum board surfaces to receive sheet wall covering system or texturing.
      b. Pre-installation conference.
   2. 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.
   3. 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 Classrooms and Vestibules:
      a. New Surfaces: Use MPI(a) INT 9.2B Latex Finish system.
      b. Previously Finished Work: Use MPI(r) RIN 9.2B Latex Finish system.

C. Performance:
   1. Design Criteria:
      a. New Surfaces: MPI Premium Grade finish requirements.
      b. Deteriorated Existing Surfaces: MPI Premium Grade finish requirements.
      c. Sound Existing Surfaces: MPI Custom Grade requirements.

d. Gloss / Sheen Required:
1) Gloss Level 5.

D. Materials:
1. Primers:
a. MPI Product 50, 'Primer Sealer, Latex, Interior'.
2. Finish Coats:
a. MPI Product 141, 'Latex, Interior, High Performance Architectural, Semi-Gloss (MPI Gloss Level 5)'.

PART 3 - EXECUTION

3.1 APPLICATION

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

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

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

END OF SECTION

SECTION 09 9124

INTERIOR PAINTED METAL

PART 1 - GENERAL

1.1 SUMMARY

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

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.

1.2 ADMINISTRATIVE REQUIREMENTS

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

PART 2 - PRODUCTS

2.1 SYSTEM

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

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

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

D. Materials:

1. Primers:
   a. Ferrous Metal: MPI Product 107, 'Primer, Rust-Inhibitive, Water Based'.
   b. Galvanized Metal: MPI Product 134: 'Primer, Galvanized, Water Based'.
   c. Aluminum: MPI Product 95: 'Primer, Quick Dry, for Aluminum'.
2. Finish Coats: MPI Product 153: 'Light Industrial Coating, Interior, Water Based, Semi-Gloss (MPI Gloss Level 5)'.

PART 3 - EXECUTION

3.1 APPLICATION

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

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

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

END OF SECTION

SECTION 09 9324

INTERIOR CLEAR-FINISHED HARDWOOD

PART 1 - GENERAL

1.1 SUMMARY

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

B. Related Requirements:
   1. Section 06 4512: ‘Architectural Woodwork Wood Trim’.
   2. Section 09 9001: 'Common Painting And Coating Requirements':
      a. Pre-installation conference for Sections under 09 9000 heading ‘Paints and Coatings’.
      b. 'Attachment': Paint Color Schedule' for O&M / R&I Projects.

1.2 REFERENCES

A. Reference Standards:
   1. Kitchen Cabinet Manufacturers Association / American National Standards Institute:
      a. ANSI/KCMA A161.1-2000 (R2005) 23-Jan-2001 ‘Recommended Performance and Construction Standards for Kitchen and Vanity Cabinets.’

1.3 ADMINISTRATIVE REQUIREMENTS

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

1.4 SUBMITTALS

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

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

PART 2 - PRODUCTS

2.1 SYSTEM

A. Materials:

1. Design Criteria:
   a. See appropriate paragraphs of Section 09 9001.
2. Stain: MPI 90, 'Stain, Semi-Transparent, for Interior Wood'.
3. Clear Finish Coats:
   a. Field Finished:
      1) Chemcraft International Inc:
         a) First, Second, And Third Coats: 20 Sheen Opticlear Pre-Catalyzed Lacquer.
      2) ICI Dulux / Trinity:
         a) First Coat: ICE Vinyl Sanding Sealer.
         b) Second And Third Coats: ICI Pre-Catalyzed Lacquer.
      3) Lilly / Valspar:
         a) First, Second, And Third Coats: 20 Sheen Pre-Catalyzed Lacquer 587E208.
      4) Sherwin-Williams:
         a) First Coat: T67F3 Vinyl Sealer.
         b) Second And Third Coats: T77F38 Sherwood Pre-Catalyzed Lacquer DRE.
   b. Mill Finished: Architectural Woodwork finished in a mill may use one (1) coat of Vinyl Sealer and two (2) coats of Conversion Varnish or three (3) coats of Conversion Varnish from one (1) of the approved Finish Manufacturers, as recommended by Finish Manufacturer.
   c. Products meeting testing requirements for finishes of ANSI / KCMA A161.1 may be used upon approval of submission by Architect before use. See Section 01 6200.
4. Color:
   a. Design Criteria:
      1) Finish to match Owner selected existing hardwood finish.
         a) Class Two products: See Section 01 6200 for definitions of Categories.
            (1) LDS Cherry stain: S4XXR1093 by Sherwin Williams.
            (2) Sealer: V81FH4 by Sherwin Williams.
         b) Option One Toner:
            (1) Toner: T7XXN11343 by Sherwin Williams.
         c) Option Two Toner:
            (1) 1 qt (0.946 liter) cherry stain.
            (2) 2 qts (1.893 liter) sealer.
            (3) 6 qts (5.678 liter) lacquer thinner.
            (4) Red oxide 42.8 grams.
            (5) Black 25.0 grams.
            (6) Medium yellow 30 grams.
         d) Finish:
            (1) Finish: V84FF8007 by Sherwin Williams.
         e) Application:
            (1) Use quart spray pot. Apply gently and lightly to surface.
            (2) Use control sample at all times.
            (3) Spray on stain and let stand five (5) minutes before wiping off. Let dry sixteen (16) hours (or overnight).
            (4) Use sealer and let dry one (1) hour.
            (5) Buff surfaces with 220 grit sanding sponge blocks.
            (6) Blow off dust.
            (7) Spray on toner (let dry thirty (30) minutes minimum).
            (8) Spray on finish.

PART 3 - EXECUTION

3.1 APPLICATION

A. General:
   1. See appropriate paragraphs of Section 09 9001.
   2. Sand entire exposed surface of item to be finished lightly with 120 to 150 non-stearated sandpaper and clean before applying dye or stain.

3. Apply stain in accordance with Manufacturer's recommendations and as necessary to attain correct color.
4. Scuff sand with 220 non-stearated sandpaper between application of application stain and first finish coat.
5. If wood is finished before installation, finish cut ends and other unfinished, exposed surfaces same as previously finished surfaces after installation of wood.

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

END OF SECTION

SECTION 09 9413

INTERIOR TEXTURED FINISHING

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Furnish and apply texturing on walls and ceilings 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. Light Orange Peel: Sprayed texture leaves light splatter on walls. Resembles peel of orange. If done with fine spray, can be one of the lightest, least noticeable of the texture styles.

1.3 ADMINISTRATIVE REQUIREMENTS

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

1.4 SUBMITTALS

A. Action Submittals:
   1. Samples:
      a. Light Orange Peel Texture:
         1) Provide minimum of three (3) 24 inch (600 mm) square control samples on primed gypsum wallboard of ‘light orange peel’ texture to show possible variations.

1.5 QUALITY ASSURANCE

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

PART 2 - PRODUCTS

2.1 SYSTEM

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

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

PART 3 - EXECUTION

3.1 APPLICATION

A. Location:
   1. Walls:
      a. Light Orange Peel Texture:
         1) All walls as noted on the Drawings.
   2. Ceilings:
      a. Smooth Finish (verify to match Serving Area ceiling):

B. Finishing:
   1. Light Orange Peel Texture:
      a. After gypsum board is taped and sanded, apply texture. Closely match samples accepted by Architect.
         1) After wall has been textured, apply priming and finish paint as specified in Section 09 9123.

END OF SECTION

SECTION 14 4216

VERTICAL WHEELCHAIR LIFTS

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Furnish and install stair-forming vertical wheelchair lifts as described in Contract Documents.

B. Related Requirements:
   1. Section 01 1100: 'Summary Of Work' for carpeting furnished and installed by Owner.
   2. Section 03: 3111: 'Cast-In-Place Structural Concrete'.
   3. Section 06 1100: 'Wood Framing' for Rough carpentry for blocking in framed construction for lift.
   4. Division 09: Painting of non-exposed metal surfaces.
   5. Division 26: Conduit, wiring, boxes, and electrical power stub-in.

1.2 REFERENCES

A. Reference Standards
   1. American Society of Mechanical Engineers:
      a. ASME A18.1-2014, ‘Safety Standard for Platform Lifts and Stairway Chairlifts'.
   2. American Society of Mechanical Engineers:
      a. ASME A17.1-2016/CSA B44-16, 'Safety Code for Elevators and Escalators' (Bi-national standard with CSA B44-10).
      b. ASME-A17.5-2014/CSA B44.1-14, ‘Elevator and Escalator Electrical Equipment’.
   3. National Fire Protection Association:
      a. NFPA (Fire) 70 'National Electrical Code' (2015 or most recent edition adopted by AHJ).

1.3 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Coordinate with Architect top and bottom “call / send” station locations for compatibility and code compliance.
   2. Coordinate location of electrical junction boxes with Electrical to be surfaced mounted on pit wall.
      a. Junction boxes to be 4 inch (100 mm) x 4 inch (100 mm) x 2 inch (50 mm) deep, located as shown on shop drawings.

1.4 SUBMITTALS

A. Action Submittals:
   1. Shop Drawings:
      a. Provide accurate shop and erection drawings and diagrams, including required points of coordination with other trades including electrical to assure proper installation.
   2. Manufacturer’s instructions:
      a. Written installation instructions, including preparation, storage and handling requirements.

B. Informational Submittals:
   1. Design Data:
      a. ASME A18.1 Exception:

1) Provide to AHJ, technical documentation or physical performance verification to allow alternative arrangements that will assure safety equivalent to wheelchair lift which would show conformance to corresponding requirements of ASME A18.1 Standard.
2) Compliance Exception is not provided by Wheelchair Lift Manufacture. Provide technical documentation by others to show compliance.

C. Closeout Submittals:
1. Include following in Operations And Maintenance Manual specified in Section 01 7800:
a. Operations and Maintenance Data:
1) Maintenance operation instructions.
2) Replacement parts lists.
3) Maintenance data including description of operation and control, and schematic wiring diagrams.
b. Warranty Documentation:
1) Final, executed copy of Warranty.
c. Record Documentation:
1) Manufacturers documentation:
a) Manufacturer's literature.

1.5 QUALITY ASSURANCE

A. Regulatory Agency Sustainability Approvals:
1. Obtain and pay for necessary State and Municipal permits and perform such tests as may be required for acceptance and approval by Code authority.
2. Comply with requirements of ASME A18.1 with following exception:
a. The specific requirements of this Standard shall be permitted to be modified by the authority having jurisdiction based upon technical documentation or physical performance verification to allow alternative arrangements that will assure safety equivalent to that which would be provided by conformance to the corresponding requirements of this Standard.
3. Work and material shall conform to requirements of ASME ‘Safety Code for Elevators’, NFPA 70 ‘National Electric Code’, and local codes that govern requirements of installation.
a. Vertical wheelchair lift equipment shall be installed in accordance with applicable requirements of ASME A17.1/CSA B44.
b. Electrical equipment for Lift shall meet or exceed applicable requirements of ASME A17.5/CSA B44.1.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Delivery And Acceptance Requirements:
1. Ship unit ready for installation.

B. Storage And Handling Requirements:
1. Store products in manufacturer's unopened packaging until ready for installation.
2. Store components off the ground in a dry covered area, protected from adverse weather conditions.

1.7 WARRANTY

A. Manufacturer Warranty:
1. Manufacturer's two-year unconditional warranty, including replacement labor, on motor.

PART 2 - PRODUCTS

2.1 MANUFACTURED UNITS

A. Manufacturers:
1. Category Four Approved Manufacturers. See Section 01 6200 for definitions of Categories
   a. Active Equipment Co, 1047 McClaren Drive, Carmichael, CA
      1) Contact Information: office (916) 485-0199, cell (916) 531-0350, FAX (916) 359-5199.

B. Wheelchair Lift:
1. Description:
   a. Capacity: 750 lbs (340 kg) live load.
   b. Speed: 9 feet (2.75 m) per minute minimum with full live load.
   c. Motor: 1 hp, 1750 rpm, 110-volt, 60-cycle, 20 amp dedicated, single phase.
   d. Drive: Electro-Hydraulic.
   e. Controls: 24 VAC push button controls:
      1) Provide 1 button each for up and down motion at each indicated control point.
      2) Provide constant pressure for activation.
      3) Control station switch covers shall be custom fabricated and unfinished.
   f. Stairs: Custom fabricated wood step with metal covered wood and riser assembly to fit project requirements and designed to accept carpet.
   g. Safety Devices:
      1) Grounded electrical system.
   h. Category Four Approved Products. See Section 01 6200 for definitions of Categories:
      1) Step Lift Model with pedestal control mounted on platform by Active Equipment Co.
         a) Provide the appropriate model for (4 total) 6" risers with 12" treads. Field verify height of floor levels prior to fabrication.
2. Design Criteria:
   a. Meet requirements of ASME A18.1 and CSA-B613' when installed with appropriate designated barriers by others and in compliance with manufacturer's instructions.
   b. Lift assembly shall provide stairs in lowered position and function as a wheelchair lift when activated.
   c. The underside of the platform to be guarded on all sides.
   d. The toe guard is to extend at least 3 inch (76 mm) above the upper landing by solid or telescoping means.
   e. Minimum of 42 inches (1 067 mm) high self closing unperforated gate at the upper landing.
   f. 42 inches (1 067 mm) high side guards with grab rail on platform.
   g. Unperforated vertical fascia extending from the upper landing sill to the level of the lower landing sill.
   h. 42 inches (1 067 mm) high self closing unperforated gate on platform.
   i. Lower landing unperforated gate or door.
   j. Emergency stop on platform controls.
   k. Gates and doors must be provided with a combination mechanical lock and electric contact.
   l. Provide both mechanical and electrical contacts that prevent operation until both doors are closed.
3. Finishes:
   a. All steel surfaces shall be powder-coated.
   b. Colors as selected by Architect from Manufacturer's standard selections.

2.2 ASSESSORIES

A. Pit:
1. Provide concrete pit with clear inside dimensions. Verify with Manufacturer for each model.
   a. Length: 90 inches.
   b. Width: 44 inches.
   c. Depth: 36 inches.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification Of Conditions:
   1. Examine substrate and verify framing is suitable for installation and properly prepared.
   2. Verify required landings and openings are of correct size and within tolerances.
   3. Verify electrical rough-in is at correct location.
   4. Notify Architect of unsuitable conditions in writing before proceeding.
      a. Commencement of Work by installer is considered acceptance of substrate and conditions.

3.2 PREPARATION

A. General:
   1. Specified products have different requirements in relating to surrounding structure.
      a. Determine requirements for lift being used before placing slab.
      b. Coordinate Manufacturer's dimensions and requirements with other trades affected by the Work of this section.
   2. Clean surfaces thoroughly prior to installation.

3.3 INSTALLATION

A. General:
   1. Install lift in accordance with Manufacturer's installation manual to be included with shipment. Do not proceed with installation without manual.
   2. Do not use wheelchair lift for hoisting materials or personnel during construction period.

3.4 ADJUSTING

A. Adjust equipment to assure smooth and accurate operation.

3.5 CLOSE-OUT ACTIVITIES

A. Instruction of Owner: Instruct building maintenance personnel in proper operation, maintenance, and adjustment procedures utilizing Operation and Maintenance Manual.

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. Perform excavating and backfilling work required by work of this Division as described in Contract Documents.
   3. Make electrical connections to equipment provided under other Sections.
   4. Furnish and install Penetration Firestop Systems at electrical system penetrations as described in Contract Documents.

B. Products Furnished But Not Installed Under This Section:
   1. Anchor bolts and templates for exterior lighting equipment bases.

C. Related Requirements:
   1. Section 07 8400: Quality of Penetration Firestop Systems to be used on Project and submittal requirements.
   2. Section 31 2316: Criteria for performance of excavating.
   3. Section 31 2323: Criteria for performance of backfilling.

1.2 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 2726: Wiring devices / Lighting control / Dimming equipment.
         2) Section 26 2816: Enclosed switches and circuit breakers.
         3) Section 26 5100: Interior lighting fixtures.
         4) Section 26 5200: Emergency battery units.
      c. Do not purchase equipment before approval of product data.
   2. Shop Drawings:
      a. Submit on following equipment:
         1) Lighting.
         2) Disconnects.
      b. Indicate precise equipment to be used, including all options specified. Indicate wording and format of nameplates where applicable. Submit in three-ring binder with hard cover.

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

C. Closeout Submittals:
   1. Operations And Maintenance Manual Data:
      a. Modify and add to requirements of Section 01 7000 as follows:

1) Provide operating and maintenance instructions for each item of equipment submitted under Product Data.
2) Include copy of approved shop drawings.

1.3 QUALITY ASSURANCE

A. Requirements of Regulatory Agencies:
   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.

1.4 OWNER'S INSTRUCTIONS

A. Provide competent instructor for three days to train 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.

1.5 SCHEDULING

A. Include detailed sequence of individual electrical demolition operations on Construction Schedule specified in Section 01 3200.

B. Coordinate with Owner for equipment and materials to be removed by Owner.

PART 2 - PRODUCTS

2.1 SYSTEMS

A. Performance:
   1. Design Criteria:
      a. Materials and equipment provided under following Sections shall be by same Manufacturer:
         1) Section 26 2816: Enclosed Switches And Circuit Breakers.

PART 3 - EXECUTION

3.1 INSTALLERS

A. Approved Electrical Installers. See Section 01 4301 for definitions of Categories.
   1. Approved electrical installer shall be pre-approved and included in Construction Documents by Addendum.

3.2 EXAMINATION

A. All relocations, reconnections, and removals are not necessarily indicated on Drawings. Include such work without additional cost to Owner.

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

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.

B. Install Penetration Firestop System appropriate for penetration at electrical system penetrations through walls, ceilings, and top plates of walls.

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.

END OF SECTION

SECTION 26 0519

LINE-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Quality of conductors used on Project except as excluded below.

B. Related Requirements:
   1. Section 23 0933: Conductors and cables for temperature control system.
   2. Section 26 0501: Common Electrical Requirements.

1.2 REFERENCES

A. Definitions:
   1. Line Voltage: Over 70 Volts.

PART 2 - PRODUCTS

2.1 SYSTEMS

A. Line Voltage Conductors:
   1. Copper with AWG sizes as shown:
      a. Minimum size shall be No. 12 except where specified otherwise.
      b. Conductor size No. 8 and larger shall be stranded.
   2. Insulation:
      a. Standard Conductor Size No. 10 And Smaller: 600V type THWN or XHHW (75 deg C).
      b. Standard Conductor Size No. 8 And Larger: 600V Type THW, THWN, or XHHW (75 deg C).
      c. Higher temperature insulation as required by NEC or local codes.
   3. Colors:
      a. 208Y / 120 V System:
         1) Black: Phase A.
         2) Red: Phase B.
         3) Blue: Phase C.
         4) Green: Ground.
         5) White: Neutral.
      b. Conductors size No. 10 and smaller shall be colored full length. Tagging or other methods for coding of conductors size No. 10 and smaller not allowed.
      c. For feeder conductors larger than No. 10 at pull boxes, gutters, and panels, use painted or taped band or color tag color-coded as specified above.

B. Line Voltage Cables:
   1. Metal Clad Cable (MC) may be used as restricted below:
      a. Copper conductors
      b. Sizes #12 through #8
      c. Use only in indoor dry locations where:
         1) Not subject to damage.
         2) Not in contact with earth.
         3) Not in concrete.

C. Standard Connectors:
   1. Conductors No. 8 And Smaller: Steel spring wire connectors.
   2. Conductors Larger Than No. 8: Pressure type terminal lugs.
   3. Connections Outside Building: Watertight steel spring wire connections with waterproof, non-hardening sealant.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General:
   1. Conductors and cables shall be continuous from outlet to outlet.
   2. Do not use direct burial cable.

B. Line Voltage Conductors:
   1. Install conductors in raceway where indicated on Drawings. Run conductors of different voltage systems in separate conduits.
   2. Route circuits at own discretion, however, circuiting shall be as shown in Panel Schedules. Group circuit homeruns to panels as shown on Drawings.
   3. Neutrals:
      a. On three-phase, 4-wire systems, do not use common neutral for more than three circuits.
      b. On single-phase, 3-wire systems, do not use common neutral for more than two circuits.
      c. Run separate neutrals for each circuit where specifically noted on Drawings.
      d. Where common neutral is run for two or three home run circuits, connect phase conductors to breakers in panel which are attached to separate phase legs so neutral conductors will carry only unbalanced current. Neutral conductors shall be of same size as phase conductors unless specifically noted otherwise.
   4. Pulling Conductors:
      a. Do not pull conductors into conduit until raceway system is complete and cabinets and outlet boxes are free of foreign matter and moisture.
      b. Do not use heavy mechanical means for pulling conductors.
      c. Use only listed wire pulling lubricants.

C. Line Voltage Cables:
   1. Route circuits at own discretion, however, circuiting and numbering shall be as shown in Panel Schedules.
   2. Support cables using approved staples, cable ties, straps, hangers, or similar fittings, spaced as required.
   3. Where installing in framing, do not bore holes in joists or beams outside center 1/3 of member depth or within 24 inches of bearing points. Do not bore holes in vertical framing members outside center 1/3 of member width. Holes shall be one inch diameter maximum.
   4. Conceal cables within ceilings and walls of finished areas. Cables may be exposed in unfinished areas but not run on floors of mechanical equipment spaces or in such a way that they obstruct access to, operation of, or servicing of equipment.
   5. Install exposed cables parallel to or at right angles to building structure lines.
   6. Keep cables 6 inches 150 mm minimum from hot water pipes.
   7. Do not support cables from mechanical ducts or duct supports without Architect's written approval.
   8. Prohibited procedures:
      a. Boring holes for installation of cables in vertical truss members.
      b. Notching of structural members for installation of cables.

END OF SECTION

SECTION 26 0526

GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Furnish and install grounding for electrical installation as described in Contract Documents except as excluded below.

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

1.2 ADMINISTRATIVE REQUIREMENTS

A. Pre-Installation Conference: Participate in pre-installation conference specified in Section 03 3111.

PART 2 - PRODUCTS

2.1 SYSTEM

A. Manufacturers:

B. Performance:
   1. Design Criteria: Size materials as shown on Drawings and in accordance with applicable codes.

C. Materials:
   1. Grounding And Bonding Jumper Conductors: Bare copper or with green insulation.
   2. Make grounding conductor connections to ground rods and water pipes using approved bolted clamps listed for such use.
   3. Service Grounding Connections And Cable Splices: Make by exothermic process.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Interface With Other Work: Coordinate with Section 03 3111 in installing grounding conductor and placing concrete. Do not allow placement of concrete before Architect's inspection of grounding conductor installation.

B. Grounding conductors and bonding jumper conductors shall be continuous from terminal to terminal without splice. Provide grounding for following.
   1. Conduits and other conductor enclosures.
   2. Neutral or identified conductor of interior wiring system.
   3. Main panelboard, power and lighting panelboards.
   4. Non-current-carrying metal parts of fixed equipment such as motors, starter and controller cabinets, instrument cases, and lighting fixtures.

C. Pull grounding conductors in non-metallic raceways, in flexible steel conduit exceeding 72 inches 1 800 mm in length, and in flexible conduit connecting to mechanical equipment.

D. Provide grounding bushings on all feeder conduit entrances into panelboards and equipment enclosures.

E. Bond conduit grounding bushings to enclosures with minimum #10 AWG conductor.

F. Connect equipment grounds to building system ground.
   1. Use same size equipment grounding conductors as phase conductors up through #10 AWG.
   2. Use NEC Table 250-95 for others unless noted otherwise in Drawings.

G. Run separate insulated grounding cable from each equipment cabinet to electrical panel. Do not use intermediate connections or splices. Affix directly to cabinet.

H. On motors, connect ground conductors to conduit with approved grounding bushing and to metal frame with bolted solderless lug.

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 main telephone service raceway as described in Contract Documents and to comply with telephone company requirements.
4. Furnish and install main electrical service raceway to comply with electrical utility company requirements.

B. Related Requirements:
1. Section 26 0501: General Electrical Requirements.
2. Section 26 0503: Local electrical utility company shall furnish and install primary underground service.
3. Section 27 4117: Furnishing and installing of satellite dish and TV distribution systems by Church approved installer and not to be included as part of work of this Section.
4. Section 28 3100: Furnishing and installing of raceway and conduit for fire detection and alarm system.

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. Steel City, Div Thomas & Betts, Memphis, TN www.tnb.com or Thomas & Betts Ltd, Iberville, PQ (450) 347-5318.
e. Thomas & Betts, Memphis, TN www.tnb.com.
f. Walker Systems Inc, Williamstown, WV (800) 240-2601 or Walker Systems Inc / Wiremold Canada Inc, Fergus, ON (519) 843-4332.
g. Wiremold Co, West Hartford, CT www.wiremold.com.

B. Performance:
1. Design Criteria: All aspects of design of sound system have been included as requirements of Owner. Do not make changes to any aspects of installation, design, or equipment pertaining to sound system without Owner's approval through Architect and Sound Consultant.

C. Materials:
1. Raceway And Conduit:
a. Sizes:
1) 3/4 inch 19 mm for exterior use, unless indicated otherwise.
2) 1/2 inch 13 mm for interior use, unless indicated otherwise.

b. Types: Usage of each type is restricted as specified below by product.
   1) Galvanized rigid steel or galvanized intermediate metal conduit (IMC) is allowed for use in all areas. Where in contact with earth or concrete, wrap buried galvanized rigid steel and galvanized IMC conduit and fittings completely with vinyl tape.
   2) Galvanized Electrical Metallic Tubing (EMT), Flexible Steel Conduit, and Electrical Non-Metallic Tubing (ENT):
      a) Allowed for use only in indoor dry locations where it is:
         (1) Not subject to damage.
         (2) Not in contact with earth.
         (3) Not in concrete.
      b) For metal conduit systems, flexible steel conduit is required for final connections to indoor mechanical equipment.
   3) Galvanized Electrical Metallic Tubing (EMT) and Flexible Steel Conduit:
      a) Allowed for use only in indoor dry locations where it is:
         (1) Not subject to damage.
         (2) Not in contact with earth.
         (3) Not in concrete.
      b) For metal conduit systems, flexible steel conduit is required for final connections to indoor mechanical equipment.
   4) Schedule 40 Polyvinyl Chloride (PVC) Conduit:
      a) Allowed for use only underground or below concrete with galvanized rigid steel or IMC elbows and risers.
   5) Listed, Liquid-Tight Flexible Metal Conduit:
      a) Use in outdoor final connections to mechanical equipment, length not to exceed 36 inches 900 mm.
   6) Pre-wired 3/8 Inch 10 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. Seal Devices: OZ Type WSK.
3. 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 low 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.
4. Air / Vapor Barrier Back Boxes: Pre-molded polyethylene fitting between framing members and inhibiting air / vapor infiltration and exfiltration around recessed outlet boxes.

PART 3 - EXECUTION

3.1 EXAMINATION

A. 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 outlet for water cooler with Division 22.
   b. Coordinate location of outlets adjacent to or in millwork with Division 06 before rough-in. Refer conflicts to Architect and locate outlet 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. General:

C. 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. Keep raceway runs 6 inches 150 mm minimum from hot water pipes.
3. 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 NEC.
4. 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.
5. Run two spare conduits from each new panelboard to ceiling access area or other acceptable accessible area and cap for future use.
6. 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.
7. Installation in Concrete:
   a. Install no conduit in concrete unless outside diameter is less than 1/3 of slab, wall, or beam thickness in which it is embedded.
   b. Position conduits in center of concrete below reinforcing steel, and separated by minimum lateral spacing of three diameters.
   c. Elbows embedded in concrete shall be rigid steel or IMC and stubouts from concrete slabs shall extend 3 inches 75 mm minimum before making connection to EMT.
   d. Separate conduits penetrating structural slabs in buildings by 2 inches 50 mm minimum.
   e. Install seal device where underground raceways penetrate concrete building wall.
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 18 inches 450 mm deep minimum. It is permissible to install conduit directly below concrete sidewalks, however, conduit must be buried 18 inches 450 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.

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

E. 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. Install air / vapor barrier back boxes behind outlet boxes that penetrate vapor barrier.
    8. Location:
        a. Install boxes at door locations on latch side of door, unless explicitly shown otherwise on 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 within 6 inches 150 mm of door jamb.
        b. Properly center boxes located in walls with respect to doors, panels, furring, trim and consistent with architectural details. Where two or more outlets occur, space them uniformly and in straight lines with each other, if possible.
        c. Center ceramic tile boxes in tile.

F. Support factory-fabricated speaker enclosures from structure or ceiling suspension system.

END OF SECTION

SECTION 26 2816

ENCLOSED SWITCHES AND CIRCUIT BREAKERS

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Furnish and install disconnects as described in Contract Documents, except those provided integral with equipment.

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

PART 2 - PRODUCTS

2.1 ASSEMBLIES

A. Manufacturers:
   1. Category Four Approved Manufacturers. See Section 01 6200 for definitions of Categories.
      a. Disconnects: Same as Manufacturer of Project's main panelboard.
      b. Fuses.
         1) Cooper Bussmann, Ellisville, IL www.cooperbussmann.com.
         2) Edison Fuse, Ellisville, IL (314) 391-3443.
         3) Ferraz Shawmut, Newburyport, MA www.ferrazshawmut.com.
         4) Littelfuse Inc, Des Plaines, IL www.littelfuse.com.

B. Disconnects:
   1. Heavy-duty quick-make, quick-break type, non-fused unless indicated otherwise.
   2. Provide interlock to prevent opening of door when switch is in ON position.
   3. Provide means to lock switch in OFF position with padlock.
   4. Disconnects for motor circuits shall be horsepower rated.
   5. Enclosures:
      a. Interior: NEMA / CEMA Type 1.
   6. Fuses:
      a. Fuse fused disconnects with dual-element time delay fuses and equip with rejection type fuse holders.
      b. Fuses on Project shall be from single manufacturer.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Label disconnects to indicate equipment served, such as Condensing Unit CU-1. Use 1/16 inch 1.5 mm thick laminated plastic composition material with contrasting color core. Engraved letters shall be 1/4 inch 6 mm high. Attach labels with screws.

END OF SECTION