American Fork 3, 27, 35, & Stake Rostrum Lift
American Fork UT Hillcrest Stake

Plan Series: CO-79-008

165 North 350 West
American Fork, Utah

Property Number: 520-5387
BHDA Number: 1832

Architect

Lafe Harris lafe@bhdarchitects.com
BHD Architects
65 East Wadsworth Park Drive, Suite 205 Phone 801.571.0010
Draper, Utah 84020 Mobile 801.367.0608

Church Project Manager

Tom Howell thh@ldschurch.org
Utah American Fork PM Office
PO Box 268
American Fork, Utah 84003 Mobile 801.243.5710

Church Facilities Manager

Brandon Mortensen mortensenbt@ldschurch.com
Utah American Fork FM Office
PO Box 1034 Phone 801.763.2096
American Fork, Utah 84003 Mobile 801.400.9981

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FOR PROJECTS (U.S.)

B L A N K P A G E

INVITATION TO BID (U.S.)

1. CONTRACTORS INVITED TO BID THE PROJECT:

Dynamic Construction
Gines Construction
Painter Building
SRFCO, Inc.
Stone River Construction
Warner Construction

2. PROJECT:

Project Numer: 520-5387
American Fork 3, 27, 7, & Hillcrest Stake Rostrum Lift
American Fork UT Hillcrest Stake

3. LOCATION:

165 North 350 West
American Fork, UT

4. OWNER:

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

5. CONSULTANT:

BHD Architects
Lafe Harris
65 East Wadsworth Park Drive
Suite 205
Draper, UT 84020

6. DESCRIPTION OF PROJECT:

A. New step lift for rostrum. Modify rostrum walls to accommodate the lift.

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 One Hundred Fifty (150) calendar days and will be as noted in the Agreement.

9. BID OPENING: Sealed bids will be received and publicly opened on Thu, 10 May 2018 at 3:00 PM at High Council Room in northeast corner of LDS Meetinghouse at 850 North 900 East, American Fork, UT 84003.

10. BIDDING DOCUMENTS:

A. Bidding Documents may be examined at the following plan room locations:
1) Dodge Data and Analytics
Office# (859) 885-1091 / Cell# (417) 860-0242
Fax # (801) 606-7722
email:Sherry.roe@construction.com

2) Mountainlands Area Plan Room
Office (801) 288-1188 Fax (801) 288-1184
Contact: Mike Luke
Email: mike@maprutah.com

B. Bidding Documents are available to invited Contractors with a deposit of $0.00 per set. Deposit will be refunded if documents are returned complete and in good condition within five days of bid opening.

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

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

END OF DOCUMENT

INSTRUCTIONS TO BIDDERS (U.S.)

1. DOCUMENTS:

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

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

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

2. BIDDER'S REPRESENTATIONS:

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

3. BIDDING DOCUMENTS:

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

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

C. Substitutions and Equal Products
   1) Equal products may be approved upon compliance with Contract Document requirements.
   2) Base bid only on materials, equipment, systems, suppliers or performance qualities specified in the Bidding documents.
   3) Where a specified product is identified as a "quality standard", products of other manufacturers that meet the performance, properties, and characteristics of the specified "quality standard" may be used without specific approval as a substitute.

D. Addenda. Addenda will be sent to bidders and to locations where Bidding Documents are on file no later than one week prior to bid opening or by fax no later than 48 hours prior to bid opening.

4. BIDDING PROCEDURES:

A. Form and Style of Bids

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

B. Submission of Bids
1) Submit bid in sealed opaque envelope containing only bid form.
2) It is bidder's sole responsibility to see that its bid is received at or before the specified time. Bids received after specified bid opening time may be returned to bidders unopened.
3) No oral, facsimile transmitted, telegraphic, or telephonic bids, modifications, or cancellations will be considered.

C. Modification or Withdrawal of Bid
1) Bidder guarantees there will be no revisions or withdrawal of bid amount for 45 days after bid opening.
2) Prior to bid opening, bidders may withdraw bid by written request or by reclaiming bid envelope.
3) Prior to bid opening, bidder may mark and sign on the sealed envelope that bidder acknowledges any or all Addenda.

5. CONSIDERATION OF BIDS:

A. Opening Of Bids - See Invitation to Bid.

B. Acceptance Of Bid
1) No bidder will consider itself under contract after opening and reading of bids until Owner accepts Contractor's Bid Proposal by executing same.
2) Bidder's past performance, organization, subcontractor selection, equipment, and ability to perform and complete its contract in manner and within time specified, together with amount of bid, will be elements considered in award of contract.

6. FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR:

A. Agreement form will be "Contractor Bid Proposal and Project Agreement (U.S.)" provided by Owner.

7. MISCELLANEOUS:

A. Pre-Bid Conference. A pre-bid conference will be held on Thu, 3 May 2018 at 1:00 PM at 165 North 350 West, American Fork, Utah.

B. Examination Schedule for Existing Building and Site
1) Contact: Brandon Mortensen, American Fork FM Group, 110 East Main Street, American Fork, Utah, 801.763.2096.

END OF DOCUMENT

B L A N K P A G E

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

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

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

1. **Property/Project.**

Property/Project Number:	520-5387
Property Address ("Project Site"):	165 North 350 West, American Fork, Utah
Project Type:	Rostrum ADA Lift
Project Name ("Project"):	American Fork 3, 27, 7, & Hillcrest Stake Rostrum Lift
Stake Name:	American Fork UT Hillcrest Stake

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

3. **Contract Documents.** Contract Documents consist of:
   a. This Agreement;
   b. Supplementary Conditions for Bid Proposal and Project Agreement (U.S.);
   c. The Specifications (Division 01 and Divisions 02, 03, 04, 05, 06, 09, 14, 26);
   d. Drawings entitled and dated American Fork 3, 27, 35, & Stake Rostrum Lift, American Fork UT Hillcrest Stake, dated 3 May 2018;
   e. Addendum No. with date(s) _____; and
   f. All written Field Changes, written Construction Change Directives and written Change Orders when prepared and signed by Owner and Contractor.

4. **Compensation.** Owner will pay Contractor for performance of Contractor's obligations under the Contract Documents the sum of _____ Dollars ($_____). This is the Contractor's Bid Proposal Amount.

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

6. **Extras and Change Orders.** Owner may order changes in the Work by altering, adding to, or deducting from the Work. In the event of such a change, Contractor's compensation and/or the time of completion will be adjusted to reflect the change. Contractor will not commence work on any change until either: (a) Contractor and Owner have agreed in writing to the amount of the adjustment resulting from the change; or (b) Owner has issued a written order for the change acknowledging that there is a dispute regarding the compensation adjustment relating to the change. If Contractor proceeds with a change in the Work without complying with

the preceding sentence, Contractor agrees that it will not be entitled to any additional compensation for such change.

7. **Correction of Work.** Contractor will promptly correct, at its own expense,
   a. any portion of the Work which
      1) fails to conform to the requirements of the Contract Documents, or
      2) is rejected by the Owner as defective or because it is damaged or rendered unsuitable during installation or resulting from failure to exercise proper protection.
   b. any defects due to faulty materials, equipment, or workmanship which appear within a period of one year from the date of Substantial Completion or within such longer period of time as may be prescribed by law or the terms of any applicable special warranty required by the Contract Documents.

8. **Time of Completion.** Contractor will complete the Work and have it ready for Owner's inspection within One Hundred Fifty (150) calendar days from Notice to Proceed issued by Owner. Time is of the essence. If Contractor is delayed at any time in the progress of the Work by any act or neglect of Owner, or by changes in the Work, or by strikes, lockouts, unusual delay in transportation, unavoidable casualties, or acts of nature beyond Contractor's control, then the time for completion will be extended by the time that completion of the Work is delayed. However, Contractor expressly waives any damages for any such delays other than those delays willfully caused by Owner.

9. **Permits, Surveys, and Taxes.** Contractor will obtain and pay for all permits and licenses, and also pay any applicable taxes. Contractor will also obtain and pay for any surveys it needs to perform the Work. Contractor will conform to all ordinances and covenants governing the Project Site and/or Work.

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

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

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

    Contractor will provide evidence of these insurance coverages to Owner by providing an ACORD 25 (2010/05) Form or its equivalent: (1) listing Owner as the Certificate Holder and Additional Insured on the

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

13. **Independent Contractor Relationship.** The parties expressly agree that Contractor is not an agent or employee of Owner but is an independent contractor solely responsible for all expenses relating to Contractor's business.

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

15. **Confidentiality / Property Rights.**
    a. Owner will retain ownership and intellectual property rights in all plans, designs, drawings, documents, concepts, and materials provided by or on behalf of Owner to Contractor and to all work products of Contractor for or relative to Work performed under this Agreement, such products, services, and Work of Contractor constituting works made for hire. Contractor will not reuse any portions of such items provided by Owner or developed by Contractor for Owner pursuant to this Agreement, or disclose any such items to any third party without the prior written consent of Owner. Owner may withhold its consent in its' absolute discretion.
    b. In addition, Contractor shall ensure that Contractor, Subcontractors, and the employees, agents and representatives of Contractor and its Subcontractors maintain in strict confidence, and shall use and disclose only as authorized by Owner all Confidential Information of Owner that Contractor receives in connection with the performance of this Agreement. Notwithstanding the foregoing, Contractor may use and disclose any information to the extent required by an order of any court or governmental authority, but only after it has notified Owner and Owner has had an opportunity to obtain reasonable protection for such information in connection with such disclosure. For purposes of this Agreement, "Confidential Information" means:
        1) The name or address of any affiliate, customer or contractor of Owner or any information concerning the transactions of any such person with Owner;
        2) Any information relating to contracts, agreements, business plans, budgets or other financial information of Owner to the extent such information has not been made available to the public by the Owner; and
        3) Any other information that is marked or noted as confidential by the Owner at the time of its disclosure.

16. **Ownership and Use of Renderings and Photographs.** Renderings representing the Work are the property of Owner. All photographs of the Work, whether taken during performance of the Work or at completion, are the property of the Owner. The Owner reserves all rights including copyrights to renderings and photographs of the Work. No renderings or photographs shall be used or distributed without written consent of the Owner.

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

18. **No Commercial Use of Transaction or Relationship.**
    a. Without the prior written consent of Owner, which Owner may grant or withhold in its sole discretion, neither Contractor nor Contractor's affiliates, officers, directors, agents, representatives, shareholders, members, Subcontractors, or employees shall make any private commercial use of their relationship to Owner or the Work or Property, including, without limitation:

1) By referring to this Agreement, Owner, or the Work or Property verbally or in any sales, marketing or other literature, letters, client lists, press releases, brochures or other written materials except as may be necessary for Contractor to perform Contractor's obligations under the terms of this Agreement;
2) By using or allowing the use of any photographs of the Work or any part thereof, or of any service marks, trademarks or trade names or other intellectual property now or which may hereafter be associated with, owned by or licensed by Owner in connection with any service or product; or
3) By contracting with or receiving money or anything of value from any person or commercial entity to facilitate such person or entity obtaining any type of commercial identification, advertising or visibility in connection with the Work or Property.

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

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

20. **Resolution of Disputes.** In the event there is any dispute arising under the Contract Documents which cannot be resolved by agreement between the parties, either party may submit the dispute with all documentation upon which it relies to Director of Architecture, Engineering, and Construction, 50 East North Temple, Salt Lake City, Utah 84150, who will convene a dispute resolution conference within thirty (30) days. The dispute resolution conference will constitute settlement negotiations and any settlement proposal made pursuant to the conference will not be admissible as evidence of liability. In the event that the parties do not resolve their dispute pursuant to the dispute resolution conference, either party may commence legal action to

resolve the dispute. Any such action must be commenced within six (6) months from the first day of the dispute resolution conference or be time barred. Submission of the dispute to the Director as outlined above is a condition precedent to the right to commence legal action to resolve any dispute. In the event that either party commences legal action to adjudicate any dispute without first submitting the dispute to the Director, the other party will be entitled to obtain an order dismissing the litigation without prejudice and awarding such other party any costs and attorneys fees incurred by that party in obtaining the dismissal, including without limitation copy costs, and expert and consultant fees and expenses.

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

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

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

24. **Assignment of Contract.** The parties hereto will not assign any rights or obligations under this Agreement without the prior written consent of the other party.

25. **Integration Clause.** The Contract Documents reflect the full agreement of the parties with respect to the Project and the Work and supersede all prior discussions, agreements, and representations regarding the

subject matter of the Contract Documents. The Contract Documents may be amended only in a written document signed by both parties hereto.

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

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

28. **Bid Proposal/Agreement.** Contractor's submission to Owner of this agreement signed by Contractor will constitute Contractor's offer and bid proposal to perform the Work described in this agreement according to the terms thereof. Owner's signing of this agreement and delivery to Contractor of a signed copy will constitute acceptance of Contractor's offer and will convert this document to a binding agreement.

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

OWNER:	**CONTRACTOR:**
Corporation of the Presiding Bishop of The Church of Jesus Christ of Latter-day Saints, a Utah corporation sole.	(company)
Signature:	Signature:
Print Name:	Print Name:
Title:	Title:
Address: Meetinghouse Project Management Office 50 E. North Temple Street, COB12 Salt Lake City, UT 84150-0012	Address:
Telephone No: 801-240-3174	Telephone No:
Facsimile No: 801-240-1494	Facsimile No:
Email: klstoddard@ldschurch.org	Email:
Effective Date:	Fed. I.D. or SSN:
	License No:
Reviewed By:	Date Signed:

S U P P L E M E N T A R Y C O N D I T I O N S

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

ITEM 1 - GENERAL

1. Conditions of the Contract apply to each Division of the Specifications.

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

ITEM 2 - LIQUIDATED DAMAGES PAYABLE TO OWNER

This section may be included as a separate additional paragraph to the Bid Proposal and Project Agreement, at Owner's discretion:

Delay in Completion of the Work. For each day after the expiration of the designated Time of Completion that Contractor has not completed the Work, Contractor will pay Owner the amount of Two Hundred 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 Section 9 of the Contractor Bid Proposal and Project Agreement (U.S.) and replace with the following:

   9. **Permits.** 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 Bid Proposal and Project Agreement:

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

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

UTAH NOTICE OF INTENT TO OBTAIN FINAL COMPLETION:

Add the following to the Bid Proposal and Project Agreement:

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

UTAH NOTICE OF COMPLETION:

Add the following to the Bid Proposal and Project Agreement:

A. Within five (5) calendar days of final completion of the Project and in compliance with Section 38-1a-507 Utah Code Annotated, Contractor shall file with the State Construction Registry, and copy to Owner, a notice of completion which shall include, without limitation, the following:
    1. The name, address, telephone number, and email address of the person filing the notice of completion;
    2. The name of the county in which the Project and/or Project site is located;
    3. The date on which final completion is alleged to have occurred;
    4. The method used to determine final completion; and
    5. One of the following:
        a. The tax parcel identification number of each parcel included in the Project and/or Project site;
        b. The entry number of a preliminary notice on the same project that includes the tax parcel identification number of each parcel included in the Project and/or Project site; or
        c. The entry number of the building permit issued for the Project.
B. Notwithstanding any other provision of the Contract Documents to the contrary, Contractor and Owner agree that any breach or failure to comply with this Section by the Contractor will constitute a breach of contract and the Contractor will be liable for any direct, indirect, or consequential damages to the Owner flowing from this breach.

UTAH STATE PROGRESS PAYMENTS AND FINAL PAYMENT:

Replace paragraph 5 of the Bid Proposal and Project Agreement with the following:

5. <u>Payment</u>

a. If the Contractor's Bid Proposal Amount is over $100,000.00, Contractor will submit to Owner a schedule of values which allocates the Contractor's Bid Proposal Amount to various portions of the Work. This schedule, when accepted by Owner, will be used as a basis for reviewing Contractor's payment requests.
b. Progress Payments: Not more than once each month, Contractor will submit a payment request to Owner. Owner will pay Contractor progress payments for work completed within fifteen (15) days after Owner receives:
    1. Contractor's progress payment request for work to date;
    2. A certification by Contractor that Contractor has paid for all labor, materials, and equipment relating to the Work covered by prior payment requests and that Contractor will pay for all labor, materials, and equipment relating to the Work covered by the current payment request; and
    3. Conditional Waiver and Release Upon Progress Payment documents submitted by Contractor (in content complying with Utah Code § 38-1a-802) executed by each of the subcontractors performing work and/or providing materials covered by the Contractor's progress payment request.
c. Final Payment: Owner will make full and final payment of the Contract Sum due within thirty (30) days of the completion of all of the following requirements:
    1. Contractor has submitted its final payment request;
    2. Contractor has submitted a certification that Contractor has paid for all labor, materials,

and equipment relating to the Work covered by prior payment requests and that Contractor will pay for all labor, materials, and equipment relating to the Work covered by the final payment request; and

3. Contractor has submitted Waiver and Release Upon Final Payment documents (in content complying with Utah Code § 38-1a-802) executed by each of the subcontractors performing work and/or providing materials covered by the Contractor's final payment request.

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

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

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

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

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

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

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. 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. Operations and Data:
   a. Operations and maintenance submittals required by Contract Documents.
3. Warranty Documentation:
   a. Copies of warranties required by Contract Documents.
4. Record Documentation:
   a. Certifications required by Contract Documents.
   b. Documentation submittals required by Contract Documents.
   c. Testing and Inspection Reports required by Contract Documents.

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 01 0000: ‘General Requirements’:
      a. Section 01 1200: 'Multiple Contract Summary' for Owner Furnished Testing and Inspecting Services’.
      b. Section 01 4523: ‘Testing and Inspecting Services’ for testing and inspection and testing laboratory services for materials, products, and construction methods’.
   2. Section 03 3111: ‘Normal Weight Structural Concrete’.
      a. Tolerances for placing normal weight 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'.
   2. ASTM International:
      a. ASTM D1751-04 (2013), 'Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Types)'.

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.

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 Inspecting Reports of concrete formwork.

1.5 QUALITY ASSURANCE

A. 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 concrete formwork:
      a. Owner will employ testing agencies to perform testing and inspection for inspection of concrete formwork 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'.

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.
5. Use metal cold joint forms when unable to place concrete for footings, foundations, and slabs in continuous pours.

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. Expansion Joints:
      a. Install at joints between floor slab and foundation wall where shown on Drawings.

C. Form Removal:
   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. 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. Concrete Formwork:
      a. Inspections are not required and will be performed at discretion of Architect.
      b. Inspections, if performed, will include following:
         1) Concrete Formwork:
            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.

END OF SECTION

SECTION 03 2100

REINFORCEMENT BARS

PART 1 - GENERAL

1.1 SUMMARY

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

B. Related Requirements:
   1. Section 01 0000: 'General Requirements':
      a. Section 01 1200: 'Multiple Contract Summary' for Owner Furnished Testing and Inspecting Services.
      b. Section 01 4523: 'Testing and Inspecting Services' for testing and inspection, and testing laboratory services for materials, products, and construction methods.
   2. Section 03 1113: Structural Cast-In-Place Concrete Forming'.
   3. 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.
      3) No splice shall be less than 20 inches (508 mm).
      4) For epoxy coated rebar, increase lap-splice lengths by 1.5 times those listed above.
   c. In columns, splices in vertical bars are permitted only at floor levels or points of lateral support and shall consist of 45 bar diameter laps.
   d. Run reinforcement bars continuous through cold joints.

D. Tolerances:
1. Provide following minimum concrete cover for reinforcement as per ACI 318 or ACI 318M. Arrange, space and securely tie bars and bar supports to hold reinforcement in position during concrete placement operations:
   a. Concrete cast against and permanently exposed to earth:
      1) Interior Slabs on Grade: 1 inches (25 mm). clear from top of slab at 4 inches (100 mm) slabs, 2 inches (50 mm) clear at 6 inches (150 mm) slabs.
      2) Sections other than Slabs: 3 inches (75 mm).
   b. Concrete Exposed to Earth or Weather:
      1) No. 6 and Larger Bars: 2 inches (50 mm).
      2) No. 5 and Smaller Bars, W31 and D31 Wire: 1-1/2 inches (38 mm).
   c. 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) Shells, folded plate members:
         a) No. 6 bars and larger: 3/4 inch (19 mm).
         b) No. 5 bar, W31 or D31 wire, and smaller: 1/2 inch (13 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 admixtures.
      c. Compact aggregate base for miscellaneous cast-in-place concrete.
      d. 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 03 1113: 'Structural Cast-In-Place Concrete Forming'.
   2. Section 03 2100: 'Reinforcement Bars'.

1.2 REFERENCES

A. Association Publications:
   1. American Concrete Institute, Farmington Hills, MI www.concrete.org. Abstracts of ACI Periodicals and Publications.
      a. ACI 214.3R-88(97), *'Recommended Practice for Evaluation of Strength Test Results of Concrete*.
      b. ACI 224R-01, '*Control of Cracking in Concrete Structures*'.
      c. ACI 224.1R-07, '*Causes, Evaluation, and Repair of Cracks in Concrete Structures*'.
      d. ACI 224.2R-92(R2004): '*Cracking of Concrete Members in Direct Tension*'.
      e. ACI 224.3R-95(R2013), '*Joints in Concrete Construction*'.
      f. ACI 224.4R-13, *'Guide to Design Detailing to Mitigate Cracking'*.
      g. ACI 302.1R-15: '*Guide for Concrete Floor and Slab Construction'*.
      h. ACI 302.2R-06, '*Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials'*.
      i. ACI 304R-00, *'Guide for Measuring, Mixing, Transporting and Placing Concrete*'.
      j. ACI 304.6R-09, *'Guide for the Measure of Volumetric-Measuring & Continuous-Mixing Concrete Equipment*'.
      k. ACI 305R-10, '*Guide to Hot Weather Concreting'*.
      l. ACI 306R-10, *'Guide to Cold Weather Concreting'*.
      m. ACI 309.1R-08, '*Report on Behavior of Fresh Concrete During Vibration'.*
      n. ACI 311.4R-05, *'Guide for Concrete Inspection'*.
      o. ACI 347R-14, *'Guide to Formwork for Concrete'*.
      p. 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. Cementitious Materials: Portland cement alone or in combination with one or more of following: blended hydraulic cement, fly ash and other pozzolans, ground granulated blast-furnace slag, and silica fume; subject to compliance with requirements.
2. Floor Flatness (FF): Rate of change in elevation of floor over a 12 inches (305 mm) section.
3. Floor Levelness (FL): Measures difference in elevation between two points which are 10 feet (3.05 m) apart.

C. Reference Standards:
1. American Association of State and Highway Transportation Officials:
2. American Concrete Institute
   a. ACI 117-10 (R2015): 'Specifications for Tolerances for Concrete Construction and Materials and Commentary'.
   b. ACI 211.1-91(R2009), 'Standard Practice for Selecting Proportions for Normal, Heavyweight and Mass Concrete'.
   c. ACI 301-16, 'Specification for Structural Concrete for Buildings'.
   d. ACI 305.1-14, 'Specification for Hot Weather Concreting'.
   e. ACI 306.1-90 (R2002), 'Standard Specification for Cold Weather Concreting'.
   f. ACI 308.1-11, 'Standard Specification for Curing Concrete'.
   g. 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 A706/A706M-16, 'Standard Specification for Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement)'.
   b. ASTM C31/C31M-15, 'Standard Practice for Making and Curing Concrete Test Specimens in the Field'.
   c. ASTM C33/C33M-16, 'Standard Specification for Concrete Aggregates'.
   d. ASTM C39/C39M-15a, 'Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens'.
   e. ASTM C94/C94M-16, 'Standard Specification for Ready-Mixed Concrete'.
   f. ASTM C140/C140M-16, 'Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units'.
   g. ASTM C143/C143M-15, 'Standard Test Method for Slump of Hydraulic-Cement Concrete'.
   h. ASTM C150/C150M-16, 'Standard Specification for Portland Cement'.
   i. ASTM C172/C172M-14a, 'Standard Practice for Sampling Freshly Mixed Concrete'.
   j. ASTM C173/C173M-16, 'Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method'.
   k. ASTM C192/C192M-16a, 'Standard Practice for Making and Curing Concrete Test Specimens in the Laboratory'.
   l. ASTM C231/C231M-14, 'Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method'.
   m. ASTM C260/C260M-10a, 'Standard Specification for Air-Entraining Admixtures for Concrete'.
   n. ASTM C330/C330M-14, 'Standard Specification for Lightweight Aggregates for Structural Concrete'.
   o. ASTM C494/C494M-15a, 'Standard Specification for Chemical Admixtures for Concrete.
   p. ASTM C496/C496M-11, 'Standard Test Method for Splitting Tensile Strength of Cylindrical Concrete Specimens'.
   q. ASTM C567/C567M-14, 'Standard Test Method for Determining Density of Structural Lightweight Concrete'.
   r. ASTM C595/C595M-16, 'Standard Specification for Blended Hydraulic Cements'.
   s. ASTM C618-15, 'Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete'.
   t. ASTM C1077-16, 'Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation'.
   u. ASTM C1157/C1157M-11, 'Standard Performance Specification for Hydraulic Cement'.
   v. ASTM C1688/C1688M-14a, 'Standard Test Method for Density and Void Content of Freshly Mixed Pervious Concrete'.
   w. ASTM E329-14a: 'Standard Specification for Agencies Engaged in Construction Inspection and/or Testing'.

x. 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 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'.
   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 concrete 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.
      h. Review aggregate base requirements.
      i. Review formwork requirements.
      j. Review approved mix design requirements and use of admixtures.
      k. Review reinforcing bar submittals.
      l. Review installation schedule and placement of reinforcing bars.
      m. Review safety issues.

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) Proportions:
         a) Mix Type A (floor slab):
            (1) 3000 psi (20.68 MPa) minimum at twenty eight (28) days.
            (2) Water / Cementitious Material: 0.45 to 0.50 by weight.
         b) Air Entrainment: Six (6) percent, plus or minus 1-1/2 percent for exterior concrete and foundation walls exposed to freeze/thaw cycles.
         c) 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.
      2) Slump:
         a) 4 inch (100 mm) slump maximum before addition of high range water reducer.
         b) 8 inch (200 mm) slump maximum with use of high range water reducer.
         c) Slump not required for Mix Type F.
      3) Admixtures:
         a) Mix design shall show proposed admixture, amount, usage instructions, and justification for proposed use. Do not use any admixture without Architect's written approval.
         b) Mineral: An 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 cement may be substituted for cement. If substituted, consider fly ash with cement in determining amount of water necessary to provide specified water / cement ratio.

c) Chemical: Specified accelerator or retarder may be used if necessary to meet environmental conditions.
d) 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.

1.7 FIELD CONDITIONS

A. Ambient Conditions:
   1. For Cold Weather and Hot Weather Limitations, see Preparation in Part 3 of this specification.

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. Grace Construction Products, Cambridge, MA www.graceconstruction.com and Grace Canada Inc, Ajax, ON (905) 683-8561.
      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:
      a. Interior concrete floor slab:
         1) Class 5 Floor:
            a) Final finish: Hard steel-troweled finish.
      b. Interior concrete floor slabs.
         1) Class 1 Floor:
            a) Anticipated type of traffic: exposed surface – foot traffic.
            b) Special considerations: Uniform finish, nonslip aggregate in specific areas, curing.
            c) Final finish: Normal steel-troweled finish, nonslip finish where required.
   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. Table One:

Portland Cement / Blended Hydraulic Cement Equivalencies		
ASTM C150/C150M (Low Alkali)	ASTM C595/C595M	ASTM C1157/C1157M
Type I	IP	GU
Type II	IP (MS)	MS
Type III		HE
Type V		HS

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 as follows:

         a) Table Two:

Aggregates - Flat Work No. 67			
Sieve	Percent Passing	Sieve	Percent Passing
One Inch	100	25 mm	100
3/4 Inch	90 - 100	19 mm	90 - 100
3/8 Inch	20 - 55	9 mm	20 - 55
No. 4	0 - 10	4.75 mm	0 - 10
No. 8	0 - 5	2.36 mm	0 - 5

         b) Table Three:

Aggregates - All Other, Size No. 57			
Sieve	Percent Passing	Sieve	Percent Passing
1-1/2 Inch	100	38 mm	100
One Inch	95 - 100	25 mm	95 - 100
1/2 Inch	20 - 60	12 nm	25 - 60
No. 4	0 - 10	4.75 mm	0 - 10
No. 8	0 - 5	2.36 mm	0 - 5

   c. Fine:
      1) Meet requirements of ASTM C33/C33M.
      2) Aggregate shall be uniformly graded by weight as follows:

         a) Table Four:

Aggregates - Uniformly Graded by Weight			
Sieve	Percent Passing	Sieve	Percent Passing

3/8 Inch	100	9 mm	100
No. 4	95 - 100	4.75 mm	95 - 100
No. 8	80 - 100	2.36 mm	80 - 100
No. 16	50 - 85	1.18 mm	50 - 85
No. 30	25 - 60	0.60 mm	25 - 60
No. 50	10 - 30	0.30 mm	10 - 30
No. 100	2 - 10	0.15 mm	2 - 10

3. Water: Clear, apparently clean, and potable.
4. Admixtures And Miscellaneous:
   a. Mineral:
      1) Fly Ash: 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) MasterAir VR 10 (formally MB-VR), Master AE 90 (formally MB-AE) or MasterAir AE 400 (formally EverAir Plus) by BASF.
            (2) Air Mix 200 Series or AEA-92 Series by Euclid.
            (3) Air Plus or Super Air Plus by Fritz-Pak.
            (4) Sika Air by Sika.
            (5) Daravair or Darex Series AEA by W R Grace.
            (6) 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) MasterPozzolith (formerly Pozzolith) Series by BASF.
            (2) Eucon WR 75 or Eucon 91 by Euclid.
            (3) FR-2 or FR-3 by Fritz-Pak.
            (4) Plastocrete 160 by Sika.
            (5) Daracem, WRDA, or MIRA Series by W R Grace.
            (6) 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) MasterPozzolith (formerly Pozzolith) Series by BASF.
            (2) Eucon Retarder 75 by Euclid.
            (3) FR-1 or Modified FR-1 by Fritz-Pak.
            (4) Plastiment by Sika.
            (5) Daratard Series or Recover by W R Grace.
            (6) 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) MasterRheobuild 1000 (formerly Rheobuild 1000) or MasterGlenium (formerly Glenium) Series by BASF.
            (2) Eucon 37 or Eucon 537 by Euclid.
            (3) Supercizer 1 through 7 by Fritz-Pak.
            (4) Sikament 300 by Sika.
            (5) Daracem or ADVA Series by W R Grace.
            (6) 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) MasterSet AC 534 (formerly Pozzolith NC 534) or MasterSet AC 122 (formerly Pozzolith122HE) or MasterSet FP 20 (formerly Pozzutec 20+) by BASF.
(2) Accelguard 80 by Euclid.
(3) Daraset, Polarset or Lubricon by W R Grace.
(4) 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 W R Grace.
(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) Visctrol by Euclid.
(2) VMAR3 by W R Grace.
(3) 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) Eucon SRA by Euclid.
(2) Eclipse 4500 (exterior concrete) by W R Grace.
(3) Eclipse Floor 200 (interior concrete) by W R Grace.
(4) 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) Concure Systems Admixture by Consure Systems.
(2) Aridus Admixture by US Concrete.
(3) 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. Evaporation Retardant:
1. Type Two Acceptable Products:
a. MasterKure ER 50 (Formerly Confilm) by BASF.
b. Sure Film J-74 by Dayton Superior.
c. Eucobar By Euclid Chemical Co.
d. E-Con by L & M Construction Chemicals.
e. Pro Film by Unitex.
f. U S Spec Monofilm ER by U S Mix Products.
g. Equal as approved by Architect before use. See Section 01 6200.

D. Expansion Joint Filler:

E. Finishing Material (Exposed Vertical Faces of Foundation and Retaining Walls):
1. Finishing Material available in multiple concrete shades to closely match concrete surface.
2. Type Two Acceptable Products:
a. Mixture of 1 part cement (using same cement as used in concrete foundations), 1 part sand with 95 percent passing #50 sieve.
b. RapidSet WunderFixx by CTS Cement Manufacturing Corporation, Cypress, CA www.rapidset.com.
c. Equal as approved by Architect before installation. See Section 01 6200.

F. Lightweight Coarse Aggregate:
1. Lightweight coarse aggregate shall be presoaked and then introduced to mixing water for one (1) minute before cement is added and mixing started.
2. Air entrainment should be introduced into mixing water or fine aggregate.
3. Mixing of cement shall be as recommended by ACI No. 2 or as recommended by supplier of lightweight aggregate.

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: 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.

B. Surface Preparation:
   1. Earthwork Preparation:
      a. Aggregate base and subgrade:
         1) Prepare compacted aggregate base.
   2. Inserts, bolts, boxes, templates, pipes, conduits, and other accessories required by Divisions 22, 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. In order to avoid overloading of forms and ties, observe following rate of filling for various air temperatures:
         1) Table Five:

Placing Concrete Rate			
Temperature	Rate of Fill per Hour	Temperature	Rate of Fill per Hour
40 deg F	2 feet	4.4 deg C	600 mm
50 deg F	3 feet	10 deg C	900 mm
60 deg F	4 feet	15.6 deg C	1 200 mm
70 deg F	5 feet	21 deg C	1 500 mm

      f. 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.
      g. Form vertical surfaces full depth. Do not allow concrete to flow out from under forms in any degree into landscaped areas.
      h. Consolidate concrete thoroughly.
      i. Do not embed aluminum in concrete.
      j. Do not use contaminated, deteriorated, or re-tempered concrete.

k. Avoid accumulation of hardened concrete.

2. Footings:
   a. Bear 12 inches (300 mm) minimum into undisturbed earth or on mechanically compacted engineered fill. Step footings at ratio of 1-1/2 horizontal to One vertical unless detailed otherwise.
   b. Level top of finish footing and leave rough.
   c. Where joints are required, bulkhead, key horizontally, and dowel with two No. 5 reinforcing bars, 48 inches (1 200 mm) long.
3. Foundations and Walls: Leave steel projecting where required for floor tie.
4. 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.
5. 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. Rough:
      1) Top of building slabs and stairs to receive setting bed for ceramic or paver tile.
   d. 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. 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 Eight:

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 max. standard, 1/2 inch at masonry	50 mm max. 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 max.	12.7 mm max.
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_F45 / F_L35 and Minimum Local Value of F_F30 / F_L20 when tested in accordance with ASTM E1155.
      2) Used on building slabs to be covered by carpet and tile as shown on Contract Drawings. Verify and coordinate with Finish Schedule.
      3) 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.

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 Agency will sample and test for quality control during placement of concrete as directed by Architect.
      c. Testing and inspections, if performed, will include following:
         1) Periodic inspection verifying use of required design mix.
         2) Inspection at time fresh concrete is sampled to fabricate specimens for strength tests, perform slump and air content tests, and determine temperature of concrete.

3) Inspection of concrete and shotcrete placement for proper application techniques.
4) Periodic inspection for maintenance of specified curing temperature and techniques.
5) 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.
6) Concrete floor flatness and floor levelness of interior slabs as per ASTM E1155.
7) Concrete moisture and alkalinity testing. See Section 09 0503 Flooring Substrate Preparation.

d. 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.

e. 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.

f. 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 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).

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.
2. Protect installed panels from damage and until completion of project.
3. Protect installed panels from traffic until desired concrete strength is achieved.

END OF SECTION

SECTION 04 0513

CEMENT AND LIME MASONRY MORTARING

PART 1 - GENERAL

1.1 SUMMARY

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

B. Related Requirements:
   1. Section: 04 4300: 'Stone Masonry' for furnish and install mortar.

1.2 REFERENCES

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

1.3 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: ‘Common Masonry Requirements’.

1.4 SUBMITTALS

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

PART 2 - PRODUCTS

2.1 SYSTEM

A. Design Criteria:
   1. Mixing:
      a. Meet either proportion or property specifications of ASTM C270 for masonry mortar as per Table 3 ‘Proportion Specifications’ and Table 4 ‘Physical Requirements for Masonry Cement Mortars’.
      b. Conform with requirements of ASTM C780 and ASTM C1586.
      c. Machine mixing should be used whenever possible.
   2. Mortar Minimum Compressive Strength at twenty-eight (28) days:
      a. Type N: 750 psi (5 171 kPa).

1) Stone Masonry.
b. Type S: 1800 psi (12.4 MPa).

B. Materials:
1. Portland Cement:
a. Meet requirements of ASTM C150/C150M and ASTM C270.
2. Hydrated Lime:
a. Meet requirements of ASTM C207 for hydrated lime.
3. Aggregate:
a. Meet requirements of ASTM C144 and ASTM C270.

b. Stone Unit Masonry Mortar:
1) White Mortar Aggregates:
a) Natural white sand or ground white stone, as required to match existing mortar.
2) Colored Mortar Aggregates:
a) Ground marble, granite, or other sound stone, as required to match existing mortar

3) Grading requirements for joints narrower than 1/4 inch (6 mm):

Sieve	Sieve	Percent Passing	
		Natural Sand	Manufactured Sand
No. 8	2.360 mm	100	100
No. 16	1.191 mm	95 to 100	95 to 100
No. 30	0.594 mm	40 to 75	40 to 75
No. 50	0.297 mm	10 to 35	20 to 40
No. 100	0.150 mm	2 to 15	10 to 25
No. 200	0.075 mm	none	0 to 10

4) Grading requirements for pointing mortar:

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

4. Water:
a. Clean and free of acids, alkalis, and organic materials.
5. Admixtures:
a. Use no admixtures, except for color pigments specified below, without Architect's written permission. Use of any admixture to meet cold weather requirements and admixtures that increase air entrainment are expressly forbidden under all circumstances.
6. Mortar Color Pigment:
a. High purity, chemically inert, unfading, alkali-fast mineral oxides, finely ground and especially prepared for mortar.
b. Color Standard: As required to match existing mortar.
c. Type One Acceptable Products:
1) True Tone Mortar Colors by Davis Colors, Los Angeles, CA www.daviscolors.com.
2) SGS Mortar Colors by Solomon Colors, Springfield, IL www.solomoncolors.com.
3) Equal as approved by Architect before bidding. See Section 01 6200.

C. Mixes:
1. General:
a. Heat water and sand to 140 deg F (60 deg C) maximum if temperature is below 40 deg F (4.4 deg C).

2. Unit Masonry for mortar as specified in each Masonry specification section:
   a. Proportions of ingredients in compliance with proportion specification of ASTM 270 using Portland cement.

3. Stonework Mortar:
   a. One-part Portland cement to three-parts of sand.
   b. Mix in water until it will retain its form when compressed in hand.

PART 3 - EXECUTION

3.1 FIELD QUALITY CONTROL

A. Field Tests And Inspections:
   1. Field tests and inspection as specified in 04 0501: 'Common Masonry Requirements'.
   2. Sampling and testing of mortar is not required.

END OF SECTION

SECTION 04 4300

STONE MASONRY

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Furnish and install natural or cut stone work anchored to framing and sheathing as described in Contract Documents including:
      a. Mortar installation for stone masonry work.

B. Related Requirements:
   1. Section 04 0501: 'Common Masonry Requirements' for:
      a. Common masonry requirements and procedures.
      b. Pre-installation conference held jointly with other masonry related sections.
   2. Section 04 0513: 'Cement and Lime Masonry Mortaring' for quality of mortar.
   3. Section 09 2236: 'Lath' for quality of woven wire metal lath used to attach stone masonry to framing.

1.2 REFERENCES

A. 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. 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.
   3. Stone Masonry: Masonry laid up with natural stones.

B. Reference Standards:
   1. Masonry Standards Joint Committee (MSJC) - The Masonry Society (TMS) / American Concrete Institute (ACI) / American Society of Civil Engineers (SEI/ASCE):
      a. TMS 402-13/ACI 530-13/ASCE 5-13 and TMS 602-13/ACI 530.1-13/ASCE 6-13, 'Building Code Requirements and Specification for Masonry Structures'.

1.3 ADMINISTRATIVE REQUIREMENTS

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

1.4 SUBMITTALS

A. Action Submittals:
   1. Product Data: for each type of product indicated.
      a. For stone varieties proposed for use on Project, include test data indicating compliance with physical properties required by referenced ASTM standards.
   2. Samples:
      a. Stone Samples:
         1) Provide samples to show color, grade, finish, and variety of stone required.
            a) Match samples provided for Project if required by Architect.

b. Mortar Color Samples: For color required.

B. Information Submittals:
1. Qualification Statements:
a. Provide stone masonry Installer documentation if requested by Architect.

1.5 QUALITY ASSURANCE

A. Qualifications:
1. Installer Qualifications:
a. Stone Masonry:
1) Qualified installer who employs experienced stonemasons and stone fitters.

1.6 DELIVERY, HANDLING, AND STORAGE

A. Delivery And Acceptance Requirements:
1. Deliver material to site, check, and carefully unload in such a manner as to avoid soiling, damaging, or snipping.

B. Storage And Handling Requirements:
1. Store material on planks clear of ground and protect from damage, dirt, or disfigurement.

1.7 FIELD CONDITIONS

A. Ambient Conditions:
1. Cold Weather and Hot Weather Limitations:
a. As specified in Section 04 0501: ‘Common Masonry Requirements’.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Natural Stone:
1. General:
a. Match existing.
b. Reuse existing removed stone as much as possible.

B. Stone and Mortar Finish:
1. Match appearance of existing stone and mortar finish.

2.2 ACCESSORIES

A. Mortar:
1. Type 'N' Stonework Mortar as specified in Section 04 0513: 'Cement and Lime Masonry Mortaring'.

B. Ties:
1. Anchored to framing and sheathing:
a. Corrugated-metal masonry ties:
1) Corrosion resistant No. 6 US ga (4 mm) wire 'Z' shaped, 6 inches (150 mm) long, 2 inch (50 mm) legs; or 22 gauge (0.8 mm) galvanized iron, 7/8 inch (22 mm) wide, corrugated.

2.3 FABRICATION

A. Fabricate stone to comply with sizes, shapes, and tolerances recommended by applicable stone association or, if none, by stone source, for faces, edges, beds, and backs.
   1. Comply with approved samples and mockups.

B. Select stone to produce pieces of thickness, size, and shape indicated, including details on Construction Drawings. Dress joints (bed and vertical) straight and at right angle to face unless otherwise indicated.

C. Thickness of Stone: Provide thickness indicated on Contract Drawings.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification Of Conditions:
   1. Examine substrate and verify substrate is suitable for installation of masonry.
   2. Verify foundations are constructed within level alignment tolerance of ± 1/2 inch (12.7 mm) before start of stone masonry work.
   3. Notify Architect of unsuitable conditions in writing.
      a. Do not install stone masonry over unsuitable conditions.
      b. Commencement of Work by installer is considered acceptance of substrate.

3.2 PREPARATION

A. Clean dirty or stained stone surfaces by removing soil, stains, and foreign materials before setting. Clean stone by thoroughly scrubbing with fiber brushes and then drenching with clear water. Use only mild cleaning compounds that contain no caustic or harsh materials or abrasives.

3.3 INSTALLATION

A. Mortar:
   1. Cold Weather and Hot Weather Limitations:
      a. Place mortar as specified in Section 04 0501: ‘Common Masonry Requirements’.

B. Laying:
   1. Clean, chip, and drench stones just before setting, except in freezing weather.
   2. Set in full bed of mortar over wire mesh with vertical joints flushed full. Fill anchor and similar holes.
   3. Do not set heavy stones and projecting courses until mortar in course below has set sufficiently to support them.
   4. Securely prop projecting stones until wall above has been built.
   5. Do not set stone more than two courses in advance of backing.
   6. Set stonework exposed on top with vertical joints unfilled.
      a. Caulk exterior profile of these joints with rope yarn and grout from above.
      b. Rake out on top 3/4 inch (19 mm) deep.
      c. After grout has set, remove caulking for pointing.
   7. Apply sealant/coating on stone and mortar to match the appearance of the existing stone finish.

3.4 CLEANING

A. Stone Masonry:
   1. General:

a. Avoid splashing or soiling face of stones and immediately remove mortar dropped on stone faces.
b. Proprietary Acidic Cleaner:
1) Clean face of stonework upon completion with Manufacturer's standard-strength cleaner designed for removing mortar, efflorescence, and other new construction stains from stone masonry surfaces without discoloring or damaging masonry surfaces; expressly approved for intended use by cleaner manufacturer and stone producer.

2. Waste Management:
a. Clean up stone masonry debris and remove from site.

3.5 PROTECTION

A. General:
1. During construction, all walls should be kept dry by covering top of wall with strong, water-resistant membrane at end of each day or shutdown period. Covering should overhang wall by at least 24 inches (610 mm) on each side, and should be secured against wind.
2. Protect masonry with covering during rainy weather.

B. Cold Weather Requirements:
1. In cold weather, all materials and walls should be properly protected against freezing including storing of materials, preparation of mortar, heating of masonry units, laying precautions, and protection of Work.
2. Remove all masonry deemed frozen or damaged.

END OF SECTION

SECTION 05 1223

STRUCTURAL STEEL FOR BUILDINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Products Furnished But Not Installed Under This Section:
   1. Miscellaneous structural steel including following:
      a. Lintels.

1.2 REFERENCES

A. Reference Standards:
   1. American Society For Testing And Materials:
      a. ASTM A36/A36M-14, ‘Standard Specification for Carbon Structural Steel'.
      b. ASTM A53/A53M-12, ‘Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless'.
      c. ASTM A500/A500M-13, ‘Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes'.

PART 2 - PRODUCTS

2.1 COMPONENTS

A. Materials:
   1. Miscellaneous Steel:
      a. Meet requirements of ASTM A36/A36M for the following:
         1) Lintels.

B. Finishes:
   1. Galvanized.

PART 3 - EXECUTION: Not Used

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):
      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).
      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. Furnishing and installing of other fasteners are specified in individual Sections where installed.

1.2 REFERENCES

A. Reference Standards;
   1. APA-The Engineered Wood Association:
      a. APA AFG-01: Adhesives for Field-Gluing Plywood to Wood Framing (September 1974).
   2. ASTM International:
      a. ASTM A153/A153M-09, 'Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware'.
      b. ASTM D3498-03(2011), 'Standard Specification for Adhesives for Field-Gluing Plywood to Lumber Framing for Floor Systems'.
      c. ASTM F1667-11a, 'Standard Specification for Driven Fasteners: Nails, Spikes, and Staples'.

1.3 SUBMITTALS

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

PART 2 - PRODUCTS

2.1 MANUFACTURED UNITS

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

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

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

PART 3 - EXECUTION

3.1 ERECTION

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

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

END OF SECTION

SECTION 06 1100

WOOD FRAMING

PART 1 - GENERAL

1.1 SUMMARY

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

B. Products Installed But Not Furnished Under This Section:
   1. Roof related blocking, wood nailers, and curbs.
   2. Wood panel product sheathing.

1.2 REFERENCES

A. Reference Standards:
   1. National Institute of Standards and Technology (NIST), Technology Administration, U. S. Department of Commerce:
      a. Voluntary Product Standard DOC PS 20-05, 'American Softwood Lumber Standard'.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Pre-Installation Conference:
   1. Participate in 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) Scope of Work.

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.

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. 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. Lumber shall be S4S.
      e. Preservative Treated Plates / Sills:
         1) 2x4 (38 mm by 64 mm): Standard and better Douglas Fir, Southern Pine, or HemFir, or StrandGuard by iLevel by Weyerhaeuser Boise, ID www.ilevel.com. (LSL 1.3 E)
         2) 2x6 (38 mm by 140 mm) And Wider: No. 2 or or MSR 1650f - 1.5e Douglas Fir, Southern Pine, HemFir, or StrandGuard by iLevel by Weyerhaeuser, Boise, ID www.ilevel.com. (LSL 1.3 E).

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

C. See drawings for additional requirements.

2.2 ACCESSORIES

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

B. Furring Strips:
   1. Utility or better.

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 and Contract Drawings.

END OF SECTION

SECTION 06 2001

COMMON FINISH CARPENTRY REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Furnish and install sealants required for items installed under this Section, as described in Contract Documents.
   2. Furnish and install following items as described in Contract Documents:

B. Products Installed But Not Furnished Under This Section:
   1. Plastic Laminate Countertops.
   2. Selected Building Specialties.
   3. Miscellaneous as specified elsewhere.

C. Related Requirements:
   1. Section 06 1100: 'Wood Framing' for furring and blocking.
   2. Section 06 4005: 'Plastic Laminate' for countertops.
   3. Section 07 9213: 'Elastomeric Joint Sealants' for quality of sealants, submittal and installation requirements.
   4. Sections in Division 10: Furnishing of Specialties.

1.2 REFERENCES

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

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION

3.1 EXAMINATION

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

3.2 PREPARATION

A. Items Installed But Not Furnished Under This Section: Install in accordance with requirements specified in Section furnishing item.

3.3 INSTALLATION

A. Special Techniques:

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

B. General Architectural Woodwork Installation:
1. Fabricate work in accordance with measurements taken on Project site.
2. Scribe, miter, and join accurately and neatly to conform to details.
3. Exposed surfaces shall be machine sanded, ready for finishing.
4. Allow for free movement of panels.
5. Countersink nails. Countersink screws and plug those exposed to view.
6. Attach custom casework as specified in Sections under 06 4000 Heading: 'Furnishing of Architectural Woodwork' to wall blocking with #10 x 3 inch (76 mm) minimum Cabinet Screws. Attach wall cabinets with screws equally spaced horizontally not to exceed 12 inches (305 mm) O.C. with 3 inch (76 mm) maximum spacing at cabinet edges.

END OF SECTION

SECTION 06 4001

COMMON ARCHITECTURAL WOODWORK REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

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

B. Related Requirements:
   1. Section 06 1100: 'Wood Framing' for furring and blocking.
   2. Section 06 2001: 'Common Finish Carpentry Requirements' for Installation.
   3. Section 06 4005: ‘Plastic Laminate’.
   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. Approved VMR Fabricator:
         1) Fabricator First Submittal:
            a) Provide 1/4 inch (or larger) scale building layout and/or description of required room walls required for field dimension for Field Quality Control Submittal. Provide submittal before rough framing is completed.
         2) Fabricator Second Submittal:
            a) Provide shop drawings for cabinet and casework that are included for project showing details, casework locations and layout and required dimensions based on Field Quality Control Submittals for compliance to Contract Drawings for approval to Project Architect.

B. Informational Submittals:
   1. Field Quality Control Submittals:
      a. Contractor First Submittal:

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

b. Second Submittal:
1) Provide verification field dimensions and updated Contract Drawings after Rostrum floor framing and gypsum board is installed in Rostrum area as requested from First Submittal from Approved VMR Fabricator including the following:
   a) Field dimensions (finish wall dimensions) of all walls in rostrum area if included on project.
   b) Field dimensions of rostrum floor framing.

2. Qualification Statement:
a. Fabricator:
1) VMR Approved Fabricators:
   a) Provide Qualification documentation as part of VMR agreement process.

1.4 QUALITY ASSURANCE

A. Qualifications: Requirements of Section 01 4301 applies, but not limited to following:
1. Fabricator:
a. VMR Approved Fabricators:
1) Approval subject to VMR agreement process approval.
2) Submit documentation to Architect or Owner.

1.5 DELIVERY, HANDLING, AND STORAGE

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

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

1.6 WARRANTY

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

PART 2 - PRODUCTS

2.1 ASSEMBLIES

A. Design Criteria:
1. General:

a. AWS Custom Grade is minimum acceptable standard, except where explicitly specified otherwise, for materials, construction, and installation of architectural woodwork.

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

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

PART 3 - EXECUTION: Not Used

END OF SECTION

SECTION 06 4005

PLASTIC LAMINATE

PART 1 - GENERAL

1.1 SUMMARY

A. Products Furnished But Not Installed Under This Section:
   1. Plastic laminate on Rostrum.

B. Related Requirements:
   1. Section 06 2001: 'Common Finish Carpentry Requirements':
      a. Installation of wall-hung counters.

1.2 REFERENCES

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

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

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

1.3 SUBMITTALS

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

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

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

1.4 QUALITY ASSURANCE

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

PART 2 - PRODUCTS

2.1 MATERIALS

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

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

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

b) Horizontal (other than countertops): GP 38.
2) No raised lip on front edge.
b. Balancing Material: BK 20.
c. AWS Quality Grade: Premium.
2. Assemblies:
a. Countertops shall meet requirements of KCMA A161.1.
b. Adhesives for other than post-formed types shall be spray grade, high heat resistant, neoprene contact adhesive.
3. Color as selected by Architect from any of the acceptable manufacturers.

PART 3 - EXECUTION: Not Used

END OF SECTION

SECTION 06 4313

WOOD STAIRS

PART 1 - GENERAL

1.1 SUMMARY

A. Products Furnished But Not Installed Under This Section:
   1. Stair treads and risers to:
      a. Rostrum.

B. Related Requirements:
   1. Section 06 1100: 'Wood Framing' for stair stringers.
   2. Section 06 1636: 'Wood Panel Product Sheathing'.
   3. Section 06 2001: 'Common Finish Carpentry Requirements' for Installation.
   4. Section 06 4001: 'Common Architectural Woodwork Requirements'.

PART 2 - PRODUCTS

2.1 ASSEMBLIES

A. Materials:
   1. Treads:
      a. 5/4 inch (32 mm) clear Douglas Fir or Southern Pine, or 1-1/8 inch (28 mm) thick high density particle board preformed stair tread.
      b. Treads to have 1/2 inch (13 mm) radius at top outside edge.
   2. Risers: 4/4 inch (25 mm) clear Douglas Fir or Southern Pine, or 3/4 inch (19 mm) plywood meeting requirements specified in Section 06 1636.

PART 3 - EXECUTION: Not Used

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 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 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 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 LDS 3/28" C by Active Equipment Co.
         a) Provide the appropriate model for (3) 6" risers with 12" treads. Field verify height of existing Rostrum framing 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 prime coated.
   b. 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: 7'-11 1/4" (2 420 mm).
   b. Width: 44 inches (1 118 mm).
   c. Depth: 36 inches (915 mm).

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.

1.2 REFERENCES

A. Reference Standards:
   1. National Fire Protection Association / American National Standards Institute:
      a. NFPA 70-2011, National Electric Code (NEC).
   2. National Electrical Manufacturing Association Standards (NEMA):
      a. NEMA 250-2014, ‘Enclosure for Electrical Equipment (1000 Volts Maximum)’.

1.3 SUBMITTALS

A. Action Submittals:
   1. Product Data:
      a. Provide following information for each item of equipment:
         1) Catalog Sheets.
         2) Assembly details or dimension drawings.
         3) Installation instructions.
         4) Manufacturer's name and catalog number.
         5) Name of local supplier.
      b. Furnish such information for following equipment:
         1) Section 26 2726: 'Wiring Devices' for lighting control and dimmer equipment.
         2) Section 26 2816: 'Enclosed Switches And Circuit Breakers'.
         3) Section 26 5100: 'Interior Lighting Fixtures'.

B. Informational Submittals:
   1. Test And Evaluation Reports:
      a. Report of site tests, before Substantial Completion.
   2. Qualification Statement:
      a. Electrical Subcontractor:
         1) Provide Qualification documentation if requested by Architect or Owner.
      b. Installer:
         1) Provide Qualification documentation if requested by Architect or Owner.

C. Closeout Submittals:

1. Include following in Operations And Maintenance Manual specified in Section 01 7800:
    a. Operations and Maintenance Data:
        1) Provide operating and maintenance instructions for each item of equipment submitted under Product Data.
    b. Record Documentation:
        1) Manufacturers documentation:
            a) Manufacturer's literature.
            b) Include copy of approved shop drawings.

1.4 QUALITY ASSURANCE

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

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

PART 2 - PRODUCTS

2.1 SYSTEMS

A. Performance:
1. Design Criteria:
    a. Materials and equipment provided under following Sections shall be by same Manufacturer:
        1) Section 26 2417: Panelboards.
        2) Section 26 2816: Enclosed Switches And Circuit Breakers.

PART 3 - EXECUTION

3.1 INSTALLERS

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

3.2 EXAMINATION

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

3.3 INSTALLATION

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

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

3.4 FIELD QUALITY CONTROL

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

3.5 CLOSEOUT ACTIVITIES

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

END OF SECTION

SECTION 26 0519

LINE-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 SUMMARY

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

B. Related Requirements:
   1. Section 23 0933: 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. Cord Sets For Ranges: Three pole, 4 wire grounding, 125/250V, NEMA 14-50P plug, 48 inch (1 200 mm) cord length minimum.

D. 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 (600 mm) of bearing points. Do not bore holes in vertical framing members outside center 1/3 of member width. Holes shall be one inch diameter maximum.
4. Conceal cables within ceilings and walls of finished areas. Cables may be exposed in unfinished areas but not run on floors of mechanical equipment spaces or in such a way that they obstruct access to, operation of, or servicing of equipment.
5. Install exposed cables parallel to or at right angles to building structure lines.
6. Keep cables 6 inches (150 mm) minimum from hot water pipes.
7. Do not support cables from mechanical ducts or duct supports without Architect's written approval.
8. Prohibited procedures:
   a. Boring holes for installation of cables in vertical truss members.
   b. Notching of structural members for installation of cables.

END OF SECTION

SECTION 26 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 03 3111: 'Normal Weight Structural Concrete'.
      a. Pre-installation conference held jointly with other concrete related sections.
   2. Section 26 0501: 'Common Electrical Requirements'.
   3. Section 26 4301: 'Surge Protection Devices'.

1.2 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 Architect's inspection of grounding conductor installation before placement of concrete.

1.3 QUALITY ASSURANCE

A. Regulatory Agency Sustainability Approvals: Requirements of Section 27 1501 applies, but is not limited to following:
   1. Cable assemblies shall be UL / CE Listed and CSA Certified. Cables shall be a distinctive green or green/yellow in color, and all jackets shall be UL, VW-1 flame rated.
   2. Grounding shall conform to all required Commercial Building Grounding and Bonding Requirements for Telecommunications, Electrical Codes, and Manufacturer's grounding requirements.

B. Qualifications: Requirements of Section 01 4301 applies, but is not limited to following:
   1. Installers Qualifications:
      a. Grounding and Bonding:
         1) Licensed electrical contractor shall perform installation and termination of main bonding conductor to building service entrance ground.
         2) Licensed in State that Work is to be performed.

PART 2 - PRODUCTS

2.1 SYSTEM

A. Manufacturers:
   1. Type One Acceptable Products:
      a. 'Cadweld' by Erico International, Solon, OH www.erico.com.
      b. 'ThermOweld' by Continental Industries, Tulsa, NE www.conind.com.
      c. Equal as approved by Architect before bidding. See Section 01 6200.

B. Performance:
   1. Design Criteria:
      a. Size materials as shown on Drawings and in accordance with applicable codes.
      b. Bonding System Workmanship:
         1) The ground/earthing system shall be designed for high reliability and shall meet following criteria:
            a) Local electrical codes shall be adhered to.
            b) All grounding/earthing conductors shall be copper.
            c) Regulatory Agency Sustainability Approvals requirements are required.
      c. Rack and Cabinet Grounding/Earthing:
         1) Equipment and racks shall be bonded in accordance with methods prescribed in ANSI/TIA-942.
         2) All grounding backbone should be #6 AWG copper cable.
         3) In telecommunications spaces with small number of racks or cabinets, rack/cabinet grounding/earthing jumper cable directly to telecommunications ground bus is permitted. Large spaces shall utilize mesh Common Bonding network, or overhead grounding backbone.
         4) Equipment racks, housings, messenger cables, and raceways:
            a) Connect cabinets, racks, frames and terminal boards to single-point ground which is connected to building ground system proper sized, bonded and tested green insulated copper grounding conductor.

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.
   4. Telecommunications ground bus bar (TGB): copper.
      a. Grounding bus bar:
         1) Technology Room shall be provided with telecommunications ground bus bar (TGB).
         2) Ground loop current potential is minimized between telecommunications equipment and electrical system to which it is attached.
      b. All racks, metallic backboards, cable sheaths, metallic strength members, splice cases, cable trays, etc. entering or residing in Technology Room shall be grounded to respective TGB using minimum #6 AWG stranded copper bonding conductor and compression connectors.

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. Electrical service, its equipment and enclosures.
   2. Conduits and other conductor enclosures.
   3. Neutral or identified conductor of interior wiring system.
   4. Main panelboard, power and lighting panelboards.
   5. Non-current-carrying metal parts of fixed equipment such as motors, starter and controller cabinets, instrument cases, and lighting fixtures.

C. Grounding connection to main water supply shall be accessible for inspection and made within 6 inches (150 mm) of point of entrance of water line to building. Provide bonding jumpers across water meter and valves to assure electrical continuity.

D. Provide concrete-encased electrode system by embedding 20 feet (6.10 m) minimum of No. 2/0 bare copper conductor in concrete footing that is in direct contact with the earth, 2 inches (50 mm) minimum below concrete surface. Extend No. 2/0 copper conductor to main panel as shown on Drawings.

E. Ground identified common conductor of electrical system at secondary side of main transformer supplying building. Ground identified grounded (neutral) conductor of electrical system on supply side of main service disconnect.

F. 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.

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

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

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

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

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

L. Ground cabinet of transformers to conduit and ground wires, if installed. Bond transformer secondary neutral conductor to cabinet.

M. TGB shall be 1/4 inch (6.4 mm) thick x 2 inches (50 mm) high x 12 inches (305 mm) long installed with insulated standoffs at location directed.

N. Ground rack to TGB using #6 copper conductor and compression connector.

3.2 FIELD QUALITY CONTROL

A. Field Inspections:
   1. Notify Architect for inspection two (2) days minimum before placing concrete over grounding conductor.

END OF SECTION

SECTION 26 0533

RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

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

B. Related Requirements:
1. Section 23 0933: 'Electric and Electronic Control System for HVAC' for concealed raceway and extensions for temperature control system.
2. Section 26 0501: 'General Electrical Requirements'.

PART 2 - PRODUCTS

2.1 SYSTEM

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

B. Materials:
   a. Sizes:
      1) 3/4 inch (19 mm) for exterior use, unless indicated otherwise.
      2) 1/2 inch (13 mm) for interior use, unless indicated otherwise.
   b. Types: Usage of each type is restricted as specified below by product.
      1) Galvanized rigid steel or galvanized intermediate metal conduit (IMC) is allowed for use in all areas. Where in contact with earth or concrete, wrap buried galvanized rigid steel and galvanized IMC conduit and fittings completely with vinyl tape.
      2) Galvanized Electrical Metallic Tubing (EMT), Flexible Steel Conduit, and Electrical Non-Metallic Tubing (ENT):
         a) Allowed for use only in indoor dry locations where it is:
            (1) Not subject to damage.
            (2) Not in contact with earth.

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

2. Raceway And Conduit Fittings:
a. Rigid Steel Conduit And IMC: Threaded and designed for conduit use.
b. EMT:
1) Compression type.
2) Steel set screw housing type.
c. PVC Conduit:
1) PVC type. Use PVC adapters at all boxes.
2) PVC components, (conduit, fittings, cement) shall be from same Manufacturer.
d. Flexible Steel Conduit: Screw-in type.
e. Liquid-tight Flexible Metal Conduit: Sealtite type.
f. Expansion fittings shall be equal to OZ Type AX sized to raceway and including bonding jumper.
g. Prohibited Fitting Materials:
1) Crimp-on, tap-on, indenter type fittings.
2) Cast set-screw fittings for EMT.
3) Spray (aerosol) PVC cement.

3. Outlet Boxes:
a. Galvanized steel of proper size and shape are acceptable for all systems. Where metal boxes are used, provide following:
1) Provide metal supports and other accessories for installation of each box.
2) Equip ceiling and bracket fixture boxes with fixture studs where required.
3) Equip outlets in plastered, paneled, and furred finishes with plaster rings and extensions to bring box flush with finish surface.
b. Non-metallic boxes may be used only for control voltage wiring systems.
c. Telephone / data outlet boxes shall be single device outlet boxes.
d. HVAC Instrumentation And Control:
1) Junction boxes in mechanical equipment areas shall be 4 inches (100 mm) square.
2) Boxes for remote temperature sensor devices shall be recessed single device.
3) Boxes for thermostats shall be 4 inches (100 mm) square with raised single device cover.

4. Air-Vapor Barrier Boxes:
a. Pre-molded polyethylene box installed in all exterior framing walls (thermal envelope) around recessed outlet boxes.
b. Class Two Quality Standard:
1) Approved Manufacturer. See Section 01 6200 for definitions of Classes.
a) Lessco Low Energy Systems Supply Company, Inc., Campbellsport, WI www.lessco-airtight.com.

PART 3 - EXECUTION

3.1 EXAMINATION

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

3.2 INSTALLATION

A. Interface With Other Work:
   1. Coordinate with Divisions 22 and 23 for installation of raceway for control of plumbing and HVAC equipment.
   2. Coordinate with Division 27 for installation of raceway for sound system.
   3. Before rough-in, verify locations of boxes with work of other trades to insure that they are properly located for purpose intended.
      a. Coordinate location of outlet for water 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.
   4. Install pull wires in raceways installed under this Section where conductors or cables are to be installed under other Divisions.

B. General:
   1. Sound system electrical components furnished by Division 27 and installed under this Section include following items:
      a. Speaker mounting rings.
      b. Speaker enclosures.

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. Install insulated bushings on each end of raceway 1-1/4 inches (32 mm) in diameter and larger, and on all raceways where cables emerge. Install expansion fittings where raceways cross building expansion joints.
   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 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.
   8. Underground Raceway And Conduit:
      a. Bury underground raceway installed outside building 24 inches (600 mm) deep minimum.
      b. Bury underground conduit in planting areas 24 inches (600 mm) deep minimum. It is permissible to install conduit directly below concrete sidewalks, however, conduit must be buried 24 inches (600 mm) deep at point of exit from planting areas.

9. 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.
10. 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. 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 boxes.
   a. Follow Manufacturer’s installation instructions.
   b. Care should be taken to cut above grade vapor barrier and seal around recessed outlet boxes to minimize air infiltration.
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.

E. Support speaker enclosures and mounting rings from structure or ceiling suspension system.

END OF SECTION

SECTION 26 2726

WIRING DEVICES

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Furnish and install wiring devices complete with plates as described in Contract Documents.

B. Related Requirements:
   1. Section 26 0501: 'Common Electrical Requirements'.
   2. Section 27 1116: 'Communications Cabinets, Racks, Frames, and Enclosures'.
   3. Section 27 1501: 'Communications Horizontal Cabling' for cables for telephone and data systems.

PART 2 - PRODUCTS

2.1 COMPONENTS

A. Manufacturers:
   1. Manufacturer Contact List:
      a. Cooper Wiring Devices, Peachtree City, GA www.cooperwiringdevices.com.
      b. General Electric Industrial Systems, Charlotte, NC www.geindustrial.com.
      c. Hubbell Building Automation, Austin, TX www.hubbell-automation.com.
      d. Hubbell Inc, Milford, CT www.hubbell-wiring.com or Hubbell Canada Inc, Pickering, ON (800) 263-4622 or (905) 839-4332.
      e. Hunt Control Systems Inc, Fort Collins, CO www.huntdimming.com.
      f. Intermatic Inc, Spring Grove, IL www.intermatic.com.
      g. Leviton Manufacturing Co, Little Neck, NY www.leviton.com or Leviton Manufacturing of Canada Ltd, Pointe-Claire, QB (800) 461-2002 or (514) 954-1840.
      h. Lightolier Controls, Dallas, TX www.lolcontrols.com or Lightolier CFI, Lachine, QB (800) 565-5486 or (514) 636-0670.
      i. Lutron Electronics Co Inc, Coopersburg, PA www.lutron.com.
      j. Novitas Inc, Peachtree City, GA www.novitas.com.
      k. Ortronics, New London, CT www.ortronics.com.
      l. Paragon Electric Co Inc, Carol Stream, IL www.icca.invensys.com/paragon or Paragon Electric, Mississauga, ON (800) 951-5526 or (905) 890-5956.
      m. Pass & Seymour, Syracuse, NY www.passandseymour.com or Pass & Seymour Canada Inc, Concord, ON (905) 738-9195.
      n. Red Dot div of Thomas & Betts, Memphis, TN www.tnbcom.
      o. Schneider Electric North America, Palatine, IL www.schneider-electric.com (847) 397-2600.
      p. Sensorswitch, Wallingford, CT www.sensorswitch.com.
      q. Siemon Company, Watertown, CT www.siemon.com.
      r. Square D Co, Palatine, IL www.squared.com.
      s. Suttle, Hector, MN www.suttleonline.com.
      t. Tork Inc, Mount Vernon, NY www.tork.com.
      u. Watt Stopper Inc, Santa Clara, CA www.wattstopper.com.
   2. Product Options:
      a. Faces shall be nylon where available.
      b. Devices of single type shall be from same Manufacturer.
      c. Devices are listed as white. Use white devices on light colored walls, brown on dark colored walls, and black on black walls.

B. Switches:
   1. Standard Style:
      a. Category Four Approved Products. See Section 01 6200 for definitions of Categories:
         1) 20 AMP, single pole for furnace disconnect:
            a) Cooper: 2221V.
            b) Hubbell: HBL1221-I.
            c) Pass & Seymour: 20AC1-I.
            d) Leviton: 1221-2I.

C. Receptacles:
   1. Standard Style:
      a. 15 AMP, specification grade, back and side wired, self grounding, tamper resistant.
      b. Verified by UL to meet Fed Spec WC-596F.
      c. Category Four Approved Products. See Section 01 6200 for definitions of Categories:
         1) Cooper: TR5262.
         2) Hubbell: BR20.
         3) Leviton: TBR20.
         4) Pass & Seymour: TR20.
   2. Ground Fault Circuit Interrupter (GFCI):
      a. 15 AMP, specification grade.
      b. Category Four Approved Products. See Section 01 6200 for definitions of Categories:
         1) Cooper: GF15W.
         2) Hubbell: GF5252WA.
         3) Leviton: 8599-W.
         4) Pass & Seymour: 1594-W.
   3. Weatherproof In-Use Receptacle Covers:
      a. NEMA 3R rated.
      b. Cast aluminum.
      c. Compatible with GFCI receptacles.
      d. Complete with weather resistant gaskets and stainless steel screws.
      e. Category Four Approved Products. See Section 01 6200 for definitions of Categories:
         1) Hubbell: WP26MH, horizontal; WP26M, vertical.
         2) Intermatic: WP1010HMC, horizontal; WP1010MC, vertical.
         3) Red Dot: CKMG, horizontal; CKMGV, vertical.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install devices flush with walls, straight, and solid to box.

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. Disconnects For Furnace Units And Unit Heaters: Provide manual starter with thermal overload relay. Provide overload relay to match motor full load amps.
   6. Enclosures:
      a. Interior: NEMA / CEMA Type 1 when indoors.
      b. Exterior: NEMA / CEMA Type 3R when outdoors.
   7. 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 (1.6 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