

# **BIDDING REQUIREMENTS**

## **FOR SMALL PROJECTS (U.S.)**

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# INVITATION TO BID (U.S.)

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

1. Broderick & Henderson Construction (801) 225-9213
2. Dynamic Construction (801) 318-9711
3. Majestic Builders (801) 798-2162
4. Painter Building (801) 556-9794
5. Oasis Builders (801) 466-1000
6. SRFCO Inc. (801) 224-1581
7. Stone River Construction (801) 636-3217
8. Warner & Associates Inc. (801) 794-0024

**2. PROJECT:**

Lakeridge 1, 3, 4

**3. LOCATION:**

158 East 1100 South, Orem, UT 84058

**4. OWNER:**

Corporation of the Presiding Bishop of  
The Church of Jesus Christ of Latter-day Saints, a Utah corporation sole  
c/o American Fork Project Management Office, 110 East Main, American Fork, Utah

**5. CONSULTANT:**

Knell Architects, P.C.  
45 East 300 North  
Provo, Utah 84606

**6. DESCRIPTION OF PROJECT:**

- A. Construction of an accessible ramp to the Rostrum and associated work.
- 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 60 calendar days and will be as noted in the Agreement.

**9. BID OPENING:** Sealed bids will be received at (time and date at place). Bids will be publicly opened at (time and date at place).

**10. BIDDING DOCUMENTS:**

- A. Bidding Documents may be examined at the following plan room locations:
  - 1) Mountainlands Area Plan Room  
583 W 3560 S, Suite 4  
Salt Lake City, Utah 84115  
Office (801) 288-1188 Fax (801) 288-1184  
Contact: Mike Luke

- 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.)

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## 1. DOCUMENTS:

- A. Bidding Documents include Bidding Requirements and proposed Contract Documents. Proposed Contract Documents consist of:
  - 1) Agreement Between Owner and Contractor for Small Project (U.S.)
  - 2) Other documents included by reference
  - 3) Addenda.
- B. Bidding Requirements are those documents identified as such in proposed Project Manual.
- C. Addenda are written or graphic documents issued prior to execution of the Contract which modify or interpret the Bidding Documents. They become part of the Contract Documents as noted in the Agreement Between Owner and Contractor for Small Project (U.S.) upon execution of the Agreement by Owner.

## 2. BIDDER'S REPRESENTATIONS:

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

## 3. BIDDING DOCUMENTS:

- A. Copies
  - 1) Owner will provide the Bidding Documents as set forth in the Invitation to Bid.
  - 2) Partial sets of Bidding Documents will not be issued.
- B. Interpretation or Correction of Bidding Documents
  - 1) Bidders will request interpretation or correction of any apparent errors, discrepancies, and omissions in the Bidding Documents.
  - 2) Corrections or changes to Bidding Documents will be made by written Addenda.
- C. Substitutions and Equal Products
  - 1) Equal products may be approved upon compliance with Contract Document requirements.
  - 2) Base bid only on materials, equipment, systems, suppliers or performance qualities specified in the Bidding documents.
  - 3) Where a specified product is identified as a "quality standard", products of other manufacturers that meet the performance, properties, and characteristics of the specified "quality standard" may be used without specific approval as a substitute.
- D. Addenda. Addenda will be sent to bidders and to locations where Bidding Documents are on file no later than one week prior to bid opening or by fax no later than 48 hours prior to bid opening.

## 4. BIDDING PROCEDURES:

- A. Form and Style of Bids
  - 1) Use Owner's Bid Form.
  - 2) Bid will be complete and executed by authorized representative of Bidder.
  - 3) Do not delete from or add to the information requested on bid form.
- B. Submission of Bids
  - 1) Submit bid in sealed opaque envelope containing only bid form.
  - 2) It is bidder's sole responsibility to see that its bid is received at or before the specified time. Bids received after specified bid opening time may be returned to bidders unopened.
  - 3) No oral, facsimile transmitted, telegraphic, or telephonic bids, modifications, or cancellations will be considered.
- C. Modification or Withdrawal of Bid
  - 1) Bidder guarantees there will be no revisions or withdrawal of bid amount for 45 days after bid opening.
  - 2) Prior to bid opening, bidders may withdraw bid by written request or by reclaiming bid envelope.
  - 3) Prior to bid opening, bidder may mark and sign on the sealed envelope that bidder acknowledges any or all Addenda.

**5. CONSIDERATION OF BIDS:**

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

**6. FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR:**

- A. Agreement form will be "Agreement Between Owner and Contractor for Small Project (U.S.)" provided by Owner.

**7. MISCELLANEOUS:**

- A. Pre-Bid Conference. A pre-bid conference may be held at a time and place to be announced.
- B. Examination Schedule for Existing Building and Site
  - 1) Contact Lynn Adams, FM, Orem Central FM Group 801-420-3713

END OF DOCUMENT

# **INFORMATION AVAILABLE TO BIDDERS (U.S.)**

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## **1. ASBESTOS-CONTAINING MATERIAL (ACM)**

- A. The building upon which work is being performed has not yet been examined for asbestos-containing material.
- B. If contractor suspects any asbestos containing material, stop work immediately and notify architect.

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# BID FORM

FOR GENERAL CONTRACT WORK (U.S.)

**PROJECT IDENTIFICATION:**

**OWNER:**

Corporation of the Presiding Bishop of the Church of Jesus Christ of Latter-day Saints, a Utah corporation sole ("Owner")

**CONSULTANT:**

## BID

1. In submitting this Bid, Bidder represents that:
  - a. If this Bid is accepted, Bidder will enter into an agreement with Owner to perform and furnish the Work described in the Bidding Documents for the Bid Price and within the Time of Substantial Completion indicated in this Bid and in accordance with the other terms and conditions of the Contract Documents.
  - b. Bidder has carefully examined the Bidding Documents consisting of the Project Manual containing the Bidding Requirements, the Conditions of the Contract, and the Specifications, entitled \_\_\_\_\_, the Drawings entitled \_\_\_\_\_ and dated \_\_\_\_\_, and including sheets numbered \_\_\_\_\_, and addenda numbers \_\_\_\_\_.
  - c. Bidder has examined the site of the work, existing conditions, and all other conditions affecting the work on the above-named Project.
  - d. Bidder has carefully correlated the information known to Bidder and information and observations obtained from visits to the site with the Bidding Documents.
  - e. Bidder is familiar with federal, State, and local laws and regulations applicable to Project.
  - f. Bidder guarantees there will be no revisions or withdrawal of bid amount for forty-five (45) days after the bid opening.
  
2. Bidder hereby proposes to furnish all materials, labor, equipment, tools, transportations, services, licenses, fees, permits, etc., required by said documents to complete the Work described by the Contract Documents for the lump-sum of: \_\_\_\_\_ Dollars (\$ \_\_\_\_\_).
  
3. Bidder agrees to achieve substantial completion of the Work within the number of days indicated in the Invitation to Bid.

RESPECTFULLY SUBMITTED:

_____	Signature	
_____	Printed name	
_____	Title	
_____	Company name	
_____	Business Address	
_____	City, State, and Zip Code	
_____	Telephone	Fax
_____	Contact Email Address	

\_\_\_\_\_ Date

\_\_\_\_\_ License No.

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

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

1. **Property/Project.**

Property/Project Number: \_\_\_\_\_  
Property Address (“Project Site”): \_\_\_\_\_  
Project Type: \_\_\_\_\_  
Project Name (“Project”): \_\_\_\_\_  
Stake Name: \_\_\_\_\_

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

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

- a. This Agreement;
- b. Supplementary Conditions for Small Project Agreement Between Owner and Contractor (U.S.);
- c. The Specifications (Division 01 and Divisions \_\_\_\_\_);
- d. Drawings entitled and dated \_\_\_\_\_;
- e. Addendum No. with date(s) \_\_\_\_\_;
- f. All written Field Changes, written Construction Change Directives and written Change Orders when prepared and signed by Owner and Contractor.

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

5. **Payment.**

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

6. **Extras and Change Orders.** Owner may order changes in the Work by altering, adding to, or deducting from the Work. In the event of such a change, the Contract Sum and/or the time of completion will be adjusted to reflect the change by means of a written Change Order signed by Contractor and Owner. Contractor will not commence work on any change until either: (a) Contractor and Owner have executed a Change Order; or (b) Owner has issued a written order for the change acknowledging that there is a dispute regarding the compensation adjustment relating to the change. If Contractor proceeds with a change in the Work without complying with the preceding sentence, Contractor agrees that it will not be entitled to any additional compensation for such change.
7. **Warranty and Correction of Work.** For all Work, services, labor, materials, products, and equipment provided under the Contract Documents, Contractor provides and extends to Owner all statutory, common law, and standard industry warranties as well as those warranties set forth in Owner's Contract Documents. Unless a longer period is specified by Owner's Contract Documents or otherwise, Contractor, at a minimum and in addition to all other warranties, warrants all Work under the Contract Documents for at least one year. Specifically, and without limitation, Contractor will promptly correct at its own expense:
  - a. any portion of the Work which
    - 1) fails to conform to the requirements of the Contract Documents, or
    - 2) is rejected by the Owner as defective or because it is damaged or rendered unsuitable during installation or resulting from failure to exercise proper protection.
  - b. any defects due to faulty materials, equipment, or workmanship which appear within a period of one year from the date of completion of the Work or within such longer period of time as may be prescribed by law or the terms of any applicable special warranty required by the Contract Documents.
8. **Time of Completion.** Contractor will complete the Work and have it ready for Owner's inspection within \_\_\_\_\_ (\_\_\_\_\_) calendar days from Notice to Proceed issued by Owner. Time is of the essence. If Contractor is delayed at any time in the progress of the Work by any act or neglect of Owner, or by changes in the Work, or by strikes, lockouts, unusual delay in transportation, unavoidable casualties, or acts of nature beyond Contractor's control, then the time for completion will be extended by the time that completion of the Work is delayed. However, Contractor expressly waives any damages for any such delays.
9. **Owner Provided Items.** Owner may provide furnishings, equipment, and/or other items for the Project. Contractor will install items furnished by Owner and/or receive, store, and protect such items on site until the date Owner accepts the Project.
10. **Product Requirements.** Contractor will provide products that comply with Contract Documents, are undamaged, and, unless otherwise indicated, are new and unused at time of installation. Contractor will provide products complete with accessories, trim, finish, safety guards, and other devices and details needed for complete installation and for intended use and effect.
11. **Permits, Surveys, and Taxes.** Contractor will obtain and pay for all permits and licenses, and also pay any applicable taxes. Contractor will also obtain and pay for any surveys it needs to perform the Work.
12. **Independent Contractor Relationship.** Contractor is not an agent or employee of Owner but is an independent contractor.
13. **Comply with Laws.** Contractor will comply, and ensure that all subcontractors comply, with all applicable laws, ordinances, rules, regulations, covenants, and restrictions.
14. **Indemnity and Hold Harmless.**
  - a. Contractor will indemnify and hold harmless Owner and Owner's representatives, employees, agents, architects, and consultants from and against any and all claims, liens, damages, liability, demands, costs, judgments, awards, settlements, causes of action, losses and expenses (collectively "Claims" or "Claim"), including but not limited to attorney fees, consultant fees, expert fees, copy costs, and other expenses, arising out of or resulting from performance of or failure to perform the Work, attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of real or personal property, including loss of use

resulting therefrom, except to the extent that such liability arises out of the negligence of Owner, its representatives, agents, and employees. This indemnity includes, without limitation, indemnification of Owner from all losses or injury to Owner's property, except to the extent that such loss or injury arises out of the negligence of Owner, its representatives, agents, and employees. This indemnity applies, without limitation, to include Claims occurring both during performance of the Work and/or subsequent to completion of the Work. In the event that any Claim is caused in part by a party indemnified hereunder, that party will bear the cost of such Claim to the extent it was the cause thereof. In the event that a claimant asserts a Claim for recovery against any party indemnified hereunder, the party indemnified hereunder may tender the defense of such Claim to Contractor. If Contractor rejects such tender of defense and it is later determined that the negligence of the party indemnified hereunder did not cause all of the Claim, Contractor will reimburse the party indemnified hereunder for all costs and expenses incurred by that party in defending against the Claim. Contractor will not be liable hereunder to indemnify any party for damages resulting from the sole negligence of that party.

- b. In addition to the foregoing, Contractor will be liable to defend Owner in any lawsuit filed by any Subcontractor relating to the Project. Where liens have been filed against Owner's property, Contractor (and/or its bonding company which has issued bonds for the Project) will obtain lien releases and record them in the appropriate county and/or local jurisdiction and provide Owner with a title free and clear from any liens of Subcontractors. In the event that Contractor and/or its bonding company are unable to obtain a lien release, Owner in its absolute discretion may require Contractor to provide a bond around the lien or a bond to discharge the lien, at Contractor's sole expense.
  - c. In addition to the foregoing, Contractor will indemnify and hold Owner harmless from any claim of any other contractor resulting from the performance, nonperformance or delay in performance of the Work by Contractor.
  - d. The indemnification obligation herein will not be limited by a limitation on the amount or type of damages, compensation or benefits payable by or for Contractor or a Subcontractor under workers compensation acts, disability benefit acts, or other employee benefit acts.
15. **Work Restrictions.** Contractor will ensure that Contractor, its agents, employees, and subcontractors:
- a. Do not use or consume alcohol or cannabis, or illegally use drugs, on the Project Site or enter on or perform any Work on the Project Site while under their influence.
  - b. Do not smoke or vape anything on the Project Site. Do not use tobacco in any form on the Project Site.
  - c. Do not perform Work on the Project Site on Sundays except for emergency work.
  - d. Refrain from using profanity or being discourteous or uncivil to others on the Project Site or while performing Work under this Agreement.
  - e. Do not view or allow pornographic or other indecent materials on the Project Site.
  - f. Do not play obnoxious and/or loud music on the Project Site. Do not play any music within existing facilities.
  - g. Refrain from wearing immodest, offensive, or obnoxious clothing, while on the Project Site.
  - h. Do not bring weapons on the Project Site.
16. **Safety Hazards.** Contractor will ensure that no work or services will be performed that may pose an undue safety hazard to Contractor, Contractor's employees, or any other person.
17. **Contractor's Insurance.** Prior to performing any work, Contractor will obtain and maintain during the term of this Agreement the following insurance:
- a. Workers Compensation Insurance or evidence of exemption.
  - b. Employers Liability Insurance with minimum limits of the greater of \$500,000 E.L. each accident, \$500,000 E.L. disease-each employee, \$500,000 E.L. disease-policy limit or as required by the law of the state in which the Project is located.
  - c. Commercial General Liability Insurance – ISO Form CG 00 01 (12/07) or equivalent Occurrence policy which will provide primary coverage to the additional insureds (the Owner and the Architect) in the event of any Occurrence, Claim, or Suit with:
    - 1) Limits of the greater of: Contractor's actual coverage amounts or the following:
      - a) \$2,000,000 General Aggregate;
      - b) \$2,000,000 Products - Comp/Ops Aggregate;

- c) \$1,000,000 Personal and Advertising Liability;
  - d) \$1,000,000 Each Occurrence; and
  - e) \$50,000 Fire Damage to Rented Premises (Each Occurrence)
- 2) Endorsements attached to the General Liability policy including the following or their equivalent:
- a) ISO Form CG-25-03 (05/09), Amendment of Limits of Insurance (Designated Project or Premises) describing the Agreement and specifying limits as shown above.
  - b) ISO Form CG 20 10 (07/04), Additional Insured – Owners, Lessees, Or Contractors (Form B), naming Owner and Architect as additional insureds.
- d. Automobile Liability Insurance, with:
- 1) Combined Single Limit each accident in the amount of no less than \$500,000; and
  - 2) Coverage applying to "Any Auto" or its equivalent.

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

18. **Resolution of Disputes.** In the event there is any dispute arising under the Contract Documents which cannot be resolved by agreement between the parties, either party may submit the dispute with all documentation upon which it relies to Director of Architecture, Engineering, and Construction, 50 East North Temple, Salt Lake City, Utah 84150, who will convene a dispute resolution conference within thirty (30) days. The dispute resolution conference will constitute settlement negotiations and any settlement proposal made pursuant to the conference will not be admissible as evidence of liability. In the event that the parties do not resolve their dispute pursuant to the dispute resolution conference, either party may commence legal action to resolve the dispute. Any such action must be commenced within six (6) months from the first day of the dispute resolution conference or be time barred. Submission of the dispute to the Director as outlined above is a condition precedent to the right to commence legal action to resolve any dispute. In the event that either party commences legal action to adjudicate any dispute without first submitting the dispute to the Director, the other party will be entitled to obtain an order dismissing the litigation without prejudice and awarding such other party any costs and attorney fees incurred by that party in obtaining the dismissal, including without limitation copy costs, and expert and consultant fees and expenses. Pending final resolution of a dispute hereunder, Contractor will proceed diligently with the performance of its obligations pursuant to this Agreement.
19. **Termination by Contractor.** In the event Owner materially breaches any term of the Contract Documents, Contractor will promptly give Written Notice of the breach to Owner. If Owner fails to cure the breach within ten (10) days of the Written Notice, Contractor may terminate this Agreement by giving Written Notice to Owner and recover from Owner the percentage of the Contract Sum represented by the Work completed on the Project site as of the date of termination together with any out of pocket loss Contractor has sustained with respect to materials and equipment as a result of the termination prior to completion of the Work, less any offsets. Contractor will not be entitled to unearned profits or any other compensation or damages as a result of the termination and hereby waives any claim therefor. Contractor will provide to Owner all warranty, as built inspection, and other close out documents as well as materials that Contractor has in its possession or control at the time of termination. Without limitation, Contractor's indemnities and obligations as well as all warranties relative to Work provided through the date of termination survive a termination hereunder.
20. **Termination by Owner for Cause.** Should Contractor fail to timely provide Owner with the certificates of insurance, make a general assignment for the benefit of its creditors, fail to apply enough properly skilled workmen or specified materials to properly prosecute the Work in accordance with Contractor's schedule, or otherwise materially breach any provision of the Contract Documents, then Owner may, without any prejudice

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

21. **Termination by Owner for Convenience.** Notwithstanding any other provision contained in the Contract Documents, Owner may, without cause and in its absolute discretion, terminate this Agreement at any time. In the event of such termination, Contractor will be entitled to recover from Owner the percentage of the Contract Sum equal to the percentage of the Work which Owner and/or its architect determines has been completed on the Project site as of the date of termination together with any out of pocket loss Contractor has sustained with respect to materials and equipment as a result of the termination prior to completion of the Work, less any offsets. Contractor will not be entitled to unearned profits or any other compensation as a result of the termination and hereby waives any claim therefor. Contractor will provide to Owner all warranty, as built, inspection, and other close out documents as well as materials that Contractor has in its possession or control at the time of termination. Owner may, in Owner's sole discretion, take legal assignment of subcontracts and other contractual rights of Contractor. Without limitation, Contractor's indemnities and obligations as well as all warranties relative to Work provided through the date of termination survive a termination hereunder.
22. **Enforcement.** In the event either party commences legal action to enforce or rescind any term of this Agreement, the prevailing party will be entitled to recover its attorney fees, costs and legal expenses, including without limitation all copy costs and expert and consultant fees and expenses, incurred in that action and on all appeals, from the other party.
23. **Ownership of Materials, Products, and Intellectual Property Rights.** Owner will retain ownership and intellectual property rights in all plans, designs, drawings, documents, concepts, and materials provided by or on behalf of Owner to Contractor and to all work products of Contractor and its subcontractors for products, services, and Work provided under this Agreement, such products, services, and Work of Contractor and its subcontractors constituting works made for hire. Neither Contractor nor its subcontractors will reuse any portion of such items provided by Owner or work products developed by Contractor or its subcontractors for Owner pursuant to this Agreement or disclose any such items to any third party without the prior written consent of Owner. Owner may withhold its consent in its absolute discretion. Contractor shall obtain the written agreement of each of its subcontractors to the terms of this section prior to permitting the subcontractor to perform any services contemplated by this Agreement.
24. **Comply with Intellectual Property Rights of Others.** Contractor represents and warrants that no Work or services (with its means, methods, goods, and services attendant thereto), provided to Owner will infringe or violate any right of any third party and that Owner may use and exploit such Work, means, methods, goods, and services without liability or obligation to any person or entity (specifically and without limitation, such Work, means, methods, goods, and services will not violate rights under any patent, copyright, trademark, or other intellectual property right or application for the same).
25. **Ownership and Use of Renderings and Photographs.** Renderings, photographs, and/or other images of or representing the services, Work, or any improvement on or relative to the Project Site, whether created before, during, or at completion of construction (and whether created by Owner, Contractor, or Contractor's subcontractors), are the property of the Owner. Contractor hereby transfers and assigns to Owner all

ownership and intellectual property rights that Contractor and/or its subcontractors may have in and to all such renderings, photographs, and other images. The Owner reserves all rights including copyrights and other intellectual property rights to such renderings, photographs, and other images. No such renderings, photographs, or other images shall be used or distributed without written consent of the Owner.

26. **Public Statements.** Contractor will not make any statements or provide any information to the media about the Project or Work without the prior written consent of Owner. If Contractor receives any requests for information from media, Contractor will refer such requests to Owner.
27. **Confidentiality.** Contractor shall ensure that Contractor and its subcontractors, and the employees, agents and representatives of Contractor and its subcontractors, maintain in strict confidence, and shall use and disclose only as authorized by Owner all Confidential Information of Owner that Contractor receives in connection with the performance of this Agreement. Notwithstanding the foregoing, Contractor may use and disclose any information to the extent required by an order of any court or governmental authority, but only after it has notified Owner and Owner has had an opportunity to obtain reasonable protection for such information in connection with such disclosure. For purposes of this Agreement, "Confidential Information" means:
- The name or address of any affiliate, customer or contractor of Owner or any information concerning the transactions of any such person with Owner;
  - Any contracts, agreements, business plans, budgets or other financial information, renderings, photographs, and materials provided by Owner, relating to the Work or any improvement on the Project Site to the extent such has not been made available to the public by the Owner;
  - Any other information that is marked or noted as confidential at the time of its disclosure.
28. **No Commercial Use of Transaction or Relationship.** Without the prior written consent of Owner, which Owner may grant or withhold in its sole discretion, neither Contractor nor Contractor's affiliates, officers, directors, agents, representatives, shareholders, members, Subcontractors, or employees shall make any private commercial use of their relationship to Owner or the Project, including, without limitation:
- By referring to the Owner or Project verbally or in any sales, marketing or other literature, letters, client lists, press releases, brochures or other written materials except as may be necessary for Contractor to perform Contractor's obligations under the terms of this Agreement;
  - By using or allowing the use of any photographs of the Work or Project or any part thereof, or of any service marks, trademarks or trade names or other intellectual property now or which may hereafter be associated with, owned by or licensed by Owner, in connection with any work, service or product; or
  - By contracting with or receiving money or anything of value from any person or commercial entity to facilitate such person or entity obtaining any type of commercial identification, advertising or visibility in connection with the Owner or Project.
- Notwithstanding the foregoing, Contractor may include a reference to Owner or the Project in a professional résumé or other similar listing of Contractor's references without seeking Owner's written consent in each instance, provided that such reference to Owner or the Project is included with at least several other similar references to projects of different owners and is given no more prominence than such other references.
29. **Entire Agreement.** This Agreement contains the entire and integrated agreement between the parties hereto and supersedes all prior negotiations, representations, or agreements, either written or oral, relating to the Project. This Agreement may be amended only by a writing signed by both parties. This Agreement will not be construed to create a contractual relationship of any kind between any persons or entities other than Owner and Contractor.
30. **Assignment.** Contractor will not assign any right or obligation hereunder without the prior written consent of the Owner, which consent may be granted or withheld in Owner's absolute discretion.
31. **Governing Law.** The parties acknowledge that the Contract Documents have substantial connections to the State of Utah. The Contract Documents will be deemed to have been made, executed, and delivered in Salt Lake City, Utah. To the maximum extent permitted by law, (i) the Contract Documents and all matters related to their creation and performance will be governed by and enforced in accordance with the laws of the State

of Utah, excluding conflicts of law rules, and (ii) all disputes arising from or related to the Contract Documents will be decided only in a state or federal court located in Salt Lake City, Utah and not in any other court or state. Toward that end, the parties hereby consent to the jurisdiction of the state and federal courts located in Salt Lake City, Utah and waive any other venue to which they might be entitled by virtue of domicile, habitual residence, place of business, or otherwise.

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

**OWNER:**

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

**CONTRACTOR:**

(company)

Signature: \_\_\_\_\_

Signature: \_\_\_\_\_

Print Name: \_\_\_\_\_

Print Name: \_\_\_\_\_

Title: \_\_\_\_\_

Title: \_\_\_\_\_

Address: \_\_\_\_\_

Address: \_\_\_\_\_

Telephone No: \_\_\_\_\_

Telephone No: \_\_\_\_\_

Facsimile No: \_\_\_\_\_

Facsimile No: \_\_\_\_\_

Email: \_\_\_\_\_

Email: \_\_\_\_\_

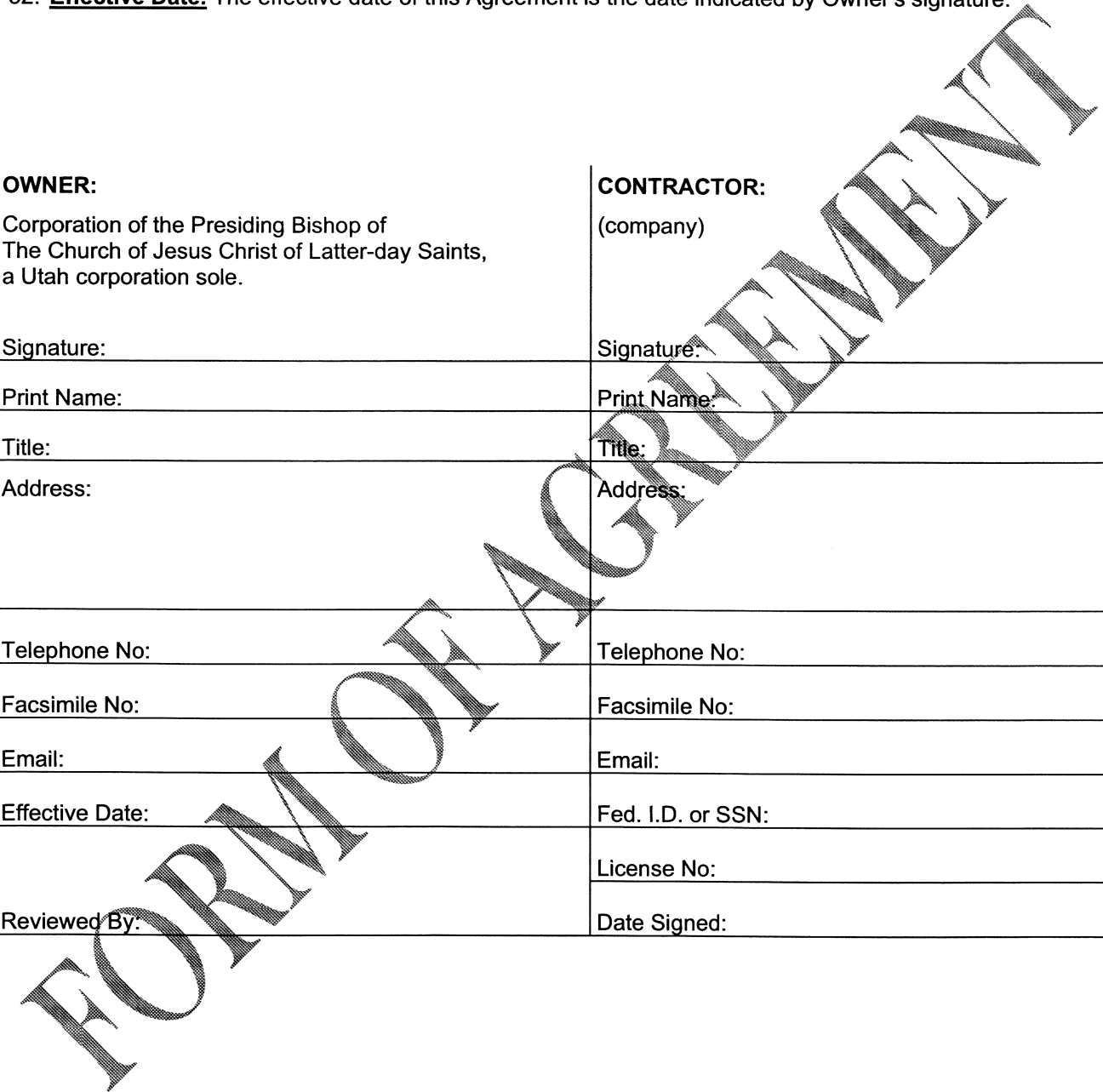
Effective Date: \_\_\_\_\_

Fed. I.D. or SSN: \_\_\_\_\_

License No: \_\_\_\_\_

Reviewed By: \_\_\_\_\_

Date Signed: \_\_\_\_\_





## **SUPPLEMENTARY CONDITIONS**

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

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#### **ITEM 1 - GENERAL**

1. Conditions of the Small Project Agreement Between Owner and Contractor (U.S.) apply to each Division of the Specifications.
2. Provisions contained in Division 01 apply to all Divisions of the Specifications.

#### **ITEM 2 - LIQUIDATED DAMAGES PAYABLE TO OWNER – Not Used**

#### **ITEM 3 - STATE SPECIFIC SUPPLEMENTARY CONDITIONS**

##### **Utah**

##### **UTAH STATE SALES TAX:**

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

1. Contractors should be exempt on purchases of material installed or converted into real property to be used by the Owner. The Contractor will furnish each vendor with a completed Exemption Certificate Form TC-721. The certificate will be prepared by the Contractor for each vendor in order to obtain the exemption.
2. The Owner's tax exempt number is 11871701-002-STC.

##### **UTAH NOTICE OF INTENT TO OBTAIN FINAL COMPLETION:**

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

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

##### **UTAH NOTICE OF COMPLETION:**

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

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

- b. The entry number of a preliminary notice on the same project that includes the tax parcel identification number of each parcel included in the Project and/or Project site; or
    - c. The entry number of the building permit issued for the Project.
  - B. Notwithstanding any other provision of the Contract Documents to the contrary, Contractor and Owner agree that any breach or failure to comply with this Section by the Contractor will constitute a breach of contract and the Contractor will be liable for any direct, indirect, or consequential damages to the Owner flowing from this breach.

#### **UTAH STATE PROGRESS PAYMENTS AND FINAL PAYMENT:**

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

#### **5. Payment**

- a. If the Contractor's Bid Proposal Amount is over \$100,000, Contractor will submit to Owner a schedule of values which allocates the Contractor's Bid Proposal Amount to various portions of the Work. This schedule, when accepted by Owner, will be used as a basis for reviewing Contractor's payment requests.
- b. Progress Payments: Not more than once each month, Contractor will submit a payment request to Owner. Owner will pay Contractor progress payments for work completed within fifteen (15) days after Owner receives:
  - 1. Contractor's progress payment request for work to date;
  - 2. A certification by Contractor that Contractor has paid for all labor, materials, and equipment relating to the Work covered by prior payment requests and that Contractor will pay for all labor, materials, and equipment relating to the Work covered by the current payment request; and
  - 3. Conditional Waiver and Release Upon Progress Payment documents submitted by Contractor (in content complying with Utah Code § 38-1a-802) executed by each of the subcontractors performing work and/or providing materials covered by the Contractor's progress payment request.
- c. Final Payment: Owner will make full and final payment of the Contract Sum due within thirty (30) days of the completion of all of the following requirements:
  - 1. Contractor has submitted its final payment request;
  - 2. Contractor has submitted a certification that Contractor has paid for all labor, materials, and equipment relating to the Work covered by prior payment requests and that Contractor will pay for all labor, materials, and equipment relating to the Work covered by the final payment request; and
  - 3. Contractor has submitted Waiver and Release Upon Final Payment documents (in content complying with Utah Code § 38-1a-802) executed by each of the subcontractors performing work and/or providing materials covered by the Contractor's final payment request.

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

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

- d. Owner may modify or reject any payment request if, in Owner's opinion, the Work for which payment is requested is not acceptable or is less complete than represented on the payment request.
- e. Upon receipt of any payment from Owner, Contractor will pay to each Subcontractor the amount paid to Contractor on account of such Subcontractor's portion of the Work.
- f. Contractor will maintain a copy of each payment request at the Project site for review by the Subcontractors.
- g. No payment made, either in whole or in part, by Owner will be construed to be an acceptance of defective or improper materials or workmanship.

END OF DOCUMENT

# Project Manual

## Lakeridge 1, 3, 4

158 East 1100 South, Orem, UT 84058

Project # 510140919010101

June 2019

THE CHURCH OF  
**JESUS CHRIST**  
OF LATTER-DAY SAINTS

ARCHITECTS:

**KNELL ARCHITECTS, P.C.**

45 EAST 300 NORTH, PROVO, UTAH 84606, (801) 373-6134

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

1. 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.
2. Comply with applicable laws and regulations.

**B. Work By Owner:**

1. 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.
2. 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.

**SECTION 01 1200 MULTIPLE CONTRACT SUMMARY****A. Separate Contracts:**

1. Contracts may be issued by Owner for performance of certain construction operations at Project site.
2. 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. Project Conditions:**

1. 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:
  - a. Confine operations to areas within Contract limits shown on Drawings. Do not disturb portions of site beyond Contract limits.
  - b. Do not allow alcoholic beverages, illegal drugs, or persons under their influence on Project Site.
  - c. Do not allow use of tobacco in any form on Project Site.
  - d. Do not allow pornographic or other indecent materials on site.

- e. Do not allow work on Project Site on Sundays except for emergency work.
  - f. Refrain from using profanity or being discourteous or uncivil to others on Project Site or while performing The Work.
  - g. Wear shirts with sleeves, wear shoes, and refrain from wearing immodest, offensive, or obnoxious clothing, while on Project Site.
  - h. Do not allow playing of obnoxious and loud music on Project Site. Do not allow playing of any music within existing facilities.
  - i. Do not build fires on Project Site.
  - j. 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.
2. Existing Facilities:
- a. Owner will occupy existing building, reasonably accommodate use of existing facilities by Owner. Clean Chapel at the end of each week to be ready for use on Sunday.

## **SECTION 01 3000 ADMINISTRATIVE REQUIREMENTS**

### **A. Administrative Requirements:**

1. Coordination:
  - a. Coordinate construction activities to ensure efficient and orderly installation of each part of the Work.
  - b. Coordinate construction operations that are dependent upon each other for proper installation, connection, and operation.
  - c. 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. Project Meetings And Conferences:**

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.
2. Pre-Installation Conferences.
  - a. Attend pre-installation conferences specified in Contract Document.

## **SECTION 01 3300 SUBMITTAL PROCEDURES**

### **A. Submittal Procedure:**

1. Coordination: Coordination preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently before performance of related construction activities to avoid delay.
2. Process Time: Allow sufficient review time so installation will not be delayed by time required to process submittals.
3. Identification: Place permanent label or title block on each submittal for identification. Include name of entity that prepared each submittal on label or title block.
4. Transmittal: Package each submittal appropriately for transmittal and handling.

### **B. Action Submittals:**

1. Product Data: Submit product data, as required by individual Sections of Specifications.
2. Shop Drawings: Submit shop drawings for review and designate (stamp) approval of shop drawings.

3. Samples: Samples used for comparison with actual component to be installed. Samples when accepted will be used for quality comparisons throughout course of construction.

C. Informational Submittals:

1. Informational submittals are design data, test reports, certificates, manufacturer's instructions, manufacturer's field reports, and other documentary data affirming quality of products and installations.
  - a. Return copies or PDF files marked with action taken and with corrections or modifications required.

D. Closeout Submittals:

1. Submittals that occur during project closeout.

## SECTION 01 3500 SPECIAL PROCEDURES

A. Quality Assurance:

1. Hot Work Permit (Available from Owner's Representative):
  - a. Required for doing hot work involving open flames or producing heat or sparks such as:
    - 1) Brazing.
    - 2) Cutting.
    - 3) Grinding.
    - 4) Soldering.
    - 5) Thawing pipe.
    - 6) Torch applied roofing.
    - 7) Welding.

## SECTION 01 4000 QUALITY REQUIREMENTS

A. Administrative Requirements:

1. Conflicting Requirements:
  - a. 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.
2. Minimum Quantity or Quality Levels:
  - a. 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.
3. 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.

B. Quality Assurance:

1. 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.
2. 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.
3. Notify Owner immediately if asbestos-containing materials or other hazardous materials are encountered while performing the Work.

C. Quality Control:

1. Quality Control Services:
  - a. Quality Control will be sole responsibility of Contractor.
    - 1) 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.
      - a) 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.

- b) Quality assurance performed by Owner will be used to validate Quality Control performed by Contractor.
- 2) 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.

D. 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. Administrative Requirements:

1. 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.
2. 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:
  - a. Avoid use of tools and equipment that produce harmful noise.
  - b. Restrict use of noisemaking tools and equipment to hours that will minimize complaints from persons or firms near site.
  - c. Protect the Work, materials, apparatus, and fixtures from injury due to weather, theft, and vandalism.
3. 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.

B. Temporary Barriers And Enclosures:

1. Erect adequate barricades, warning signs, and lights necessary to protect persons from injury or harm.
2. 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.
3. 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:

- a. 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.
  - b. 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').
  - c. 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.
  - d. 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.
  - e. 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. Utilities:
1. Electrical Power: Owner will provide electric power for construction activities within limits available at existing facility.
  2. Fire Protection: Exercise caution to avoid fire damage: Do not build fires on site.
  3. Heating, Cooling, And Ventilation:
    - a. 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.
  4. Lighting: Existing lighting system may be used by Contractor.
  5. Water Service: Contractor will use existing water supply for construction purposes to extent of existing facilities.

## **SECTION 01 6100 COMMON PRODUCT REQUIREMENTS**

- A. Administrative Requirements:
1. 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. Administrative Requirements:**

1. 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. Administrative Requirements:**

1. Deliver, store, and handle products according to manufacturer's recommendations, using means and methods that will prevent damage, deterioration, and loss, including theft.

##### **B. Delivery, Storage, and Handling:**

1. Delivery and Acceptable 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.
2. Storage and Handling Requirements:
  - a. Store products at site in manner that will simplify inspection and measurement of quantity or counting of units.
  - b. Store heavy materials away from Project structure so supporting construction will not be endangered.
  - c. 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. Administrative Requirements:**

1. Require installer of each major component to inspect both substrate and conditions under which the Work is to be done:
  - a. Notify Owner in writing of unsatisfactory conditions.
  - b. Do not proceed until unsatisfactory conditions have been corrected.

**B. Common Installation Provisions:**

1. Provide attachment and connection devices and methods necessary for securing the Work:
  - a. Secure the Work true to line and level.
  - b. Allow for expansion and building movement.
2. Recheck measurements and dimensions before starting each installation.
3. 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.
4. 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.

**C. Protection:**

1. 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.

**D. 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:**

4. Keep premises broom-clean during progress of the Work.
5. 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.
  1. Clean and maintain completed construction as frequently as necessary throughout construction period. Clean entire chapel and have it ready for Sunday Use each week unless agreed upon by Owner.
  2. 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. Administrative Requirements:**

1. Project Record Documents:
  - a. Do not use record documents for construction purposes:



- 1) Protect from deterioration and loss in secure, fire-resistive location.
  - 2) Provide access to record documents for reference during normal Working hours.
  - b. 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:
    - 1) Mark record sets with red erasable pencil. Use other colors to distinguish between variations in separate categories of the Work.
    - 2) Mark new information that is important to Owner, but was not shown on Contract Drawings.
    - 3) Note related Change Order numbers where applicable.
  2. As Built Record Drawings:
    - a. Provide two full-size sets of prints and PDF file of As Built Record Drawings to Facilities Management Office, printed from the updated AutoCAD drawing files or updated Revit model files, as specified by Owner, that have been modified to show actual dimensions and location of equipment, material, utility lines, and other work as actually constructed, based upon information provided by Contractor. Architect will submit updated As Built Record Drawings in PDF (ISO32000 format) to Owner. In addition, Architect will submit to Owner updated AutoCAD as built record drawing files with associated plot style tables or the Revit as built record model files, as specified by Owner.
- B. Operations And Maintenance Manual:
1. General:
    - a. Include closeout submittal documentation as required by Contract Documentation. Include only closeout submittals as defined in individual specification section.
    - b. Submittal Format: Digital copies unless otherwise noted, required for each individual specification section that include 'Closeout Submittals'.
  2. Project Manual:
    - c. 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.
      - (2) Show substitutions, selection of options, and similar information, particularly on elements that are concealed or cannot otherwise be readily discerned later by direct observation.
  3. Maintenance Contracts: (digital format only).
  4. Operations and Maintenance Data (digital format only):
    - a. Operations and maintenance submittals includes cleaning instructions, maintenance instructions, operations instructions, equipment list, and parts lists.
  5. Warranty Documentation: Digital format of final, executed warranties.
  6. Record Documentation:
    - a. Documentation includes Certifications, color and pattern selections, Manufacture Reports, Literature or cut sheets, Shop Drawings, Source Quality Control, Special Procedures, and Testing and Inspection Reports.
- C. 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.

**END OF SECTION**

**DIVISION 02: EXISTING CONDITIONS**

**02 4000 DEMOLITION AND STRUCTURE MOVING**

02 4119 SELECTIVE STRUCTURE DEMOLITION

END OF TABLE OF CONTENTS

**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.

**1.2 REFERENCES**

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

**1.3 ADMINISTRATIVE REQUIREMENTS**

- A. Coordination:
  - 1. Storage or sale of removed items or materials will not be permitted on-site.
- B. Pre-Installation Conference:
  - 1. Before beginning Selective Demolition work, in addition to requirements of Section 01 3100, meet on site to confirm work to be demolished, items to be salvaged or reused, and coordination with Owner.
- C. Scheduling:
  - 1. Indicate detailed sequence of selective demolition and removal work, with starting and ending dates for each activity, on Schedule specified in Section 01 3200.

**1.4 SUBMITTALS**

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

**1.5 QUALITY ASSURANCE**

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

## 1.6 FIELD CONDITIONS

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

## PART 2 - PRODUCTS: Not Used

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Verification Of Conditions:
  - 1. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
    - a. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- B. Evaluation And Assessment:
  - 1. Hazardous Materials:
    - a. It is not expected that hazardous materials will be encountered in the Work. Identified hazardous materials will be removed by Owner before start of the Work.
    - b. If materials suspected of containing hazardous materials are encountered, do not disturb and immediately notify Architect.
  - 2. Inventory and record condition of items to be removed and reinstalled and items to be removed and salvaged.
  - 3. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure nature and extent of conflict. Promptly submit written report to Architect.
  - 4. Engage a professional engineer to survey condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective demolition operations.
  - 5. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.

### 3.2 PREPARATION

- A. Temporary Facilities:
  - 1. Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
  - 2. Maintain fire-protection facilities in service during selective demolition operations.
- B. Temporary Shoring:
  - 1. Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.
  - 2. Strengthen or add new supports when required during progress of selective demolition.
- C. Utility Services:
  - 1. Existing Services/Systems: Maintain services/systems indicated to remain and protect them against damage during selective demolition operations.
  - 2. Service/System Requirements: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.
    - a. Arrange to shut off indicated utilities with utility companies.

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

### 3.3 SELECTIVE DEMOLITION

#### A. General:

1. Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
2. Demolish and remove existing construction only to extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
  - a. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
  - b. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
  - c. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain fire watch and portable fire-suppression devices during flame-cutting operations.
  - d. Maintain adequate ventilation when using cutting torches.
  - e. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
  - f. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
  - g. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
  - h. Dispose of demolished items and materials promptly.

#### B. Selective Demolition Procedures For Specific Materials:

1. Concrete: Demolish in sections. Cut concrete full depth at junctures with construction to remain and at regular intervals, using power-driven saw, then remove concrete between saw cuts.
2. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, then remove masonry between saw cuts.
3. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, then break up and remove.

#### C. Removed and Salvaged Items:

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

#### D. Removed and Reinstalled Items:

1. Clean and repair items to functional condition adequate for intended reuse. Paint equipment to match new equipment.
2. Pack or crate items after cleaning and repairing. Identify contents of containers.
3. Protect items from damage during transport and storage.
4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

- E. Existing Items to Remain:
  - 1. Protect construction indicated to remain against damage and soiling during selective demolition.
  - 2. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

### **3.4 CLEANING**

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

**END OF SECTION**

**DIVISION 03: CONCRETE**

**03 1000 CONCRETE FORMING AND ACCESSORIES**

03 1511 CONCRETE ANCHORS AND INSERTS

END OF TABLE OF CONTENTS

**SECTION 03 1511****CONCRETE ANCHORS AND INSERTS****PART 1 - GENERAL****1.1 SUMMARY**

- A. Products Furnished But Not Installed Under This Section:
1. Headed concrete anchor studs for concrete.
  2. Adhesive anchors and inserts for concrete.
  3. Drilled-in mechanical anchors for concrete.
  4. Screw anchors for concrete.
  5. Concrete anchors and inserts not specified elsewhere.
- B. Related Requirements:
1. Section 01 0000: 'General Requirements':
  2. Section 06 1100: 'Wood Framing' for installation of drilled in anchors.

**1.2 REFERENCES**

- A. Reference Standards:
1. American Concrete Institute:
    - a. ACI 548.12-12, 'Specification for Bonding Hardened Concrete and Steel to Hardened Concrete with an Epoxy Adhesive'.
  2. American National Standards Institute / American Welding Society (Following are specifically referenced for Structural Steel testing):
    - a. ANSI/AWS D1.1/D1.1M:2015, 'Structural Welding Code - Steel'.
  3. ASTM International:
    - a. ASTM A108-13, 'Standard Specification for Steel Bar, Carbon and Alloy, Cold Finished'.
    - b. ASTM A307-14, 'Standard Specification for Carbon Steel Bolts and Studs, 60 000 psi Tensile Strength'.
    - c. ASTM A563-15, 'Standard Specification for Carbon and Alloy Steel Nuts'.
    - d. ASTM A706/A706M-16, 'Standard Specification for Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement'.
    - e. ASTM F1554-15, 'Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength'.
    - f. ASTM F3125/F3125-15a, 'Standard Specification for High Strength Structural Bolts, Steel and Alloy Steel, Heat Treated, 120 ksi (830 MPa) and 150 ksi (1040 MPa) Minimum Tensile Strength, Inch and Metric Dimensions'.
  4. International Code Council (IBC):
    - a. IBC Chapter 17, 'Structural Tests and Special Inspections'.
    - b. ICC-ES Reports: 'ES Acceptance Criteria - Concrete Anchor Compendium':(ACC01, 2016).
      - 1) AC193, 'Acceptance Criteria For Mechanical Anchors in Concrete Elements' (approved Oct 2015).
      - 2) AC308 'Acceptance Criteria For Post-Installed Adhesive Anchors In Concrete Elements' (approved Jan 2016).
    - c. ICC/ESR-1056, 'Titen HD Screw Anchors' (reissued 03/2016).
    - d. ICC/ESR-1967, 'Hilti HIT HY 150 Max Adhesive Anchoring Systems' (reissued Jan 2013).

**1.3 SUBMITTALS**

- A. Action Submittals:
1. Product Data:



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

#### 1.4 QUALITY ASSURANCE

- A. Qualifications:
1. Manufacturer:
    - a. Having sufficient capacity to produce and deliver required materials without causing delay in work.
  2. Installer:
    - a. Acceptable to Manufacturer, experienced in performing work of this section and has specialized in installation of work similar to that required for this project.

#### 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Delivery And Acceptance Requirements:
1. Materials shall be delivered in original, unopened packages with labels intact.
- B. Storage And Handling Requirements:
1. Store materials protected from exposure to harmful weather conditions and as directed by Manufacturer.

### PART 2 - PRODUCTS

#### 2.1 MATERIALS

- A. Manufactured Units:
1. General:
    - a. Use hot-dipped galvanized or stainless steel with matching nuts and washers in exterior and moist interior applications unless indicated otherwise on Contract Drawings.
    - b. Install anchor bolts used to attach wood sill plates to foundation with 1/4 inch (6.4 mm) by 3 inch (76 mm) x 3 inch (76 mm) minimum adjustable plate washers and standard cut washers between wood sill plates and nuts.
    - c. Nut: Conform to requirements of ASTM A563, Grade A, Hex.
    - d. Conform to requirements of ASTM F3125/F3125 for chemical, physical and mechanical requirements for quenched and tempered bolts manufactured from steel and alloy steel.
  2. Threaded rod for adhesive anchors and cast-in anchors:
    - a. Conform to requirements of ASTM A307, Grade A or ASTM F1554.
  3. Adhesive Anchors:
    - a. Cartridge Injection Adhesive Anchors.
    - b. Products shall have current ICC ES Evaluation report conforming to current ICC ES Acceptance Criteria AC308 for concrete.
    - c. Rod diameter and embedment length as indicated on Drawings.
    - d. Type Two Acceptable Products:
      - 1) HIT-RE 500-SD Epoxy Adhesive by Hilti Fastening Systems, Tulsa, OK  
[www.us.hilti.com](http://www.us.hilti.com).
      - 2) PE1000+ by Powers Fasteners Inc., Brewster NY [www.powers.com](http://www.powers.com).

- 3) SET-XP Epoxy by Simpson Strong-Tie Co., Pleasanton, CA  
www.simpsonanchors.com.
- 4) Equal as approved by Architect before installation. See Section 01 6200.
4. Drilled-In Mechanical Anchors (Expansion Bolts):
  - a. Products shall have current ICC ES Evaluation report conforming to current ICC ES Acceptance Criteria AC193 for concrete.
  - b. Type Two Acceptable Products:
    - 1) KWIK Bolt TZ Expansion Anchor by Hilti Fastening Systems, Tulsa, OK  
www.us.hilti.com.
    - 2) KWIK-HUS EZ-I Internally Threaded Screw Anchor by Hilti Fastening Systems, Tulsa, OK  
www.us.hilti.com.
    - 3) HSL-3 Heavy Duty Expansion Anchor by Hilti Fastening Systems, Tulsa, OK  
www.us.hilti.com.
    - 4) HDA Undercut Anchor by Hilti Fastening Systems, Tulsa, OK  
www.us.hilti.com.
    - 5) Power-Stud +SD1 by Powers Fasteners Inc., Brewster NY  
www.powers.com.
    - 6) Strong-Bolt by Simpson Strong-Tie Co., Pleasanton, CA  
www.simpsonanchors.com.
    - 7) Equal as approved by Architect before installation. See Section 01 6200.
5. Screw Anchors:
  - a. Provide anchors with length identification markings conforming to ICC ES AC 193 for concrete.
  - b. Type Two Acceptable Products:
    - 1) Wedge-Bolt+ by Powers Fasteners Inc., Brewster NY  
www.powers.com.
    - 2) Titen HD Screws by Simpson Strong Tie Co, Dublin, CA  
www.strongtie.com.
    - 3) Equals as approved by Architect through shop drawing submittal before installation.  
See Section 01 6200.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

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

### **3.2 PREPARATION**

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

### **3.3 INSTALLATION**

- A. Drilled-In Anchors:
  1. General:

- a. Drill holes with rotary impact hammer drills using carbide-tipped bits or core drills using diamond core bits.
  - b. Unless otherwise shown on Drawings, drill holes perpendicular to concrete surface.
  - c. Where anchors are to be installed in cored holes, use core bits with matched tolerances specified by Manufacturer. Cored holes may only be used if acceptable to Manufacturer.
  - d. Perform anchor installation in accordance with Manufacturer's published instructions.
2. Adhesive Anchors:
- a. Clean holes in accordance with Manufacturer's published instructions before installation of adhesive:
    - 1) Follow Manufacturer's recommendations to ensure proper mixing of adhesive components.
  - b. Adhesive:
    - 1) Inject adhesive into holes proceeding from bottom of hole and progressing toward surface so as to avoid introduction of air pockets into adhesive.
    - 2) Inject sufficient adhesive into hole to ensure that annular gap is filled to surface.
    - 3) Remove excess adhesive from surface.
  - c. Shim anchors with suitable device to center anchor in hole. Do not disturb or load anchors before Manufacturer's specified cure time has elapsed.
  - d. Temperature:
    - 1) Observe Manufacturer's recommendations with respect to installation temperatures for adhesive anchors.
    - 2) Base material temperatures must be maintained above minimum temperatures allowed by Manufacturer for full required epoxy cure time.
3. Drilled-in Mechanical Anchors (Expansion Bolts):
- a. Protect threads from damage during anchor installation.
  - b. Set anchors to Manufacturer's recommended torque, using a torque wrench. Following attainment of ten (10) percent of specified torque, one hundred (100) percent of specified torque shall be reached within 7 or fewer complete turns of nut. If specified torque is not achieved within required number of turns, remove and replace anchor, unless otherwise directed by Architect.
4. Screw Anchors:
- a. Protect threads from damage during anchor installation.
  - b. Set anchors to Manufacturer's recommended torque, using a torque wrench.

### 3.4 FIELD QUALITY CONTROL

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

### 3.5 CLEANING

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

### 3.6 PROTECTION

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

**END OF SECTION**

**DIVISION 05: METALS**

**05 0500 COMMON WORK RESULTS OF METALS**

05 0523 METAL FASTENINGS

**05 1000 STRUCTURAL METAL FRAMING**

05 1200 STRUCTURAL STEEL FRAMING

**05 5000 METAL FABRICATIONS**

05 5215 STAINLESS STEEL HANDRAILS

END OF TABLE OF CONTENTS

**SECTION 05 0523****METAL FASTENING****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
  - 1. Quality of structural metal-to-metal, wood-to-metal, and wood-to-wood bolts used on Project.
  - 2. Requirements and standards for site welded metal-to-metal connections.
- B. Related Requirements:
  - 1. Section 03 1511: Cast-in-place and drilled-in anchor bolts.
  - 2. Furnishing and installing of structural bolts specified under Section concerned.
  - 3. Performance of welding specified under Section concerned.

**1.2 REFERENCES**

- A. Reference Standards:
  - 1. American National Standards Institute / American Welding Society:
    - a. ANSI/AWS D1.1/D1.1M:2010, 'Structural Welding Code - Steel'.
    - b. ANSI/AWS D1.3/D1.3M:2010, 'Structural Welding Code - Sheet Steel'.
  - 2. ASTM International:
    - a. ASTM A36/A36M-08, 'Standard Specification for Carbon Structural Steel'.
    - b. ASTM A307-10, 'Standard Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength'.
    - c. ASTM A325-10, 'Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength'.

**1.3 QUALITY ASSURANCE**

- A. Qualifications: Requirements of Section 01 4301 applies, but not limited to the following:
  - 1. Welders shall be certified 30 days minimum before beginning work on Project. If there is doubt as to proficiency of welder, Architect may require welder to take another test, at no expense to Owner. Certification shall be by Pittsburgh Laboratories or other authority approved by Architect.
- B. Certifications:
  - 1. Maintain welder's certifications on job-site.

**PART 2 - PRODUCTS****2.1 MANUFACTURED UNITS**

- A. Materials:
  - 1. Bolts And Threaded Fasteners:
    - a. Bolts: Conform to requirements of ASTM A307, Grade A.

**2.2 ACCESSORIES**

- A. Arc-Welding Electrodes: Type E70XX AWS Iron and Steel Arc-welding electrodes and meeting current AISC Specifications.

**PART 3 - EXECUTION**

**3.1 PERFORMANCE**

- A. Welding shall meet requirements of ANSI / AWS D1.1 and D1.3.
- B. Minimum weld sizes, unless detailed otherwise.
  - 1. Weld pipe columns to base plates and top plates with 1/4 inch (6 mm) fillet weld all around.

**END OF SECTION**

**SECTION 05 1200****STRUCTURAL STEEL FRAMING****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
  - 1. Furnish and install structural steel framing as part of building structure as described in Contract Documents.
- B. Related Requirements:
  - 1. Section 01 0000: 'General Requirements':
    - a. Section 01 4000: 'Quality Requirements' for administrative and procedural requirements for quality assurance and quality control.
    - b. Section 01 4301: 'Quality Assurance – Qualifications' establishes minimum qualification levels required.

**1.2 REFERENCES**

- A. Association Publications:
  - 1. American Institute of Steel Construction:
    - a. AISC 'Guide to Design Criteria for Bolted and Riveted Joints' (2nd Edition).
    - b. AISC 'Steel Construction Manual' (14th Edition).
- B. Reference Standards:
  - 1. American Concrete Institute:
    - a. ACI 318-14, 'Building Code Requirements for Structural Concrete' (ACI 318) and 'Commentary on Building Code Requirements for Structural Concrete' (ACI 318R).
    - b. ACI 318M-14, 'Building Code Requirements for Structural Concrete (ACI 318M) and Commentary' (ACI 319RM).
  - 2. American Institute of Steel Construction / The Society for Protective Coatings:
    - a. AISC 420-10/SSPC-QP 3, 'Certification Standard for Shop Application of Complex Protective Coating Systems'.
  - 3. American National Standards Institute / American Institute of Steel Construction:
    - a. ANSI/AISC 340-14, 'Specification for Structural Joints using High-Strength Bolts'.
    - b. ANSI/AISC 341-10, 'Seismic Provisions for Structural Steel Buildings'.
    - c. ANSI/AISC 358-10, 'Prequalified Connections for Special and Intermediate Steel Moment Frames for Seismic Applications'.
    - d. ANSI/AISC 360-10, 'Specification for Structural Steel Buildings'.
  - 4. American National Standards Institute / American Society for Nondestructive Testing (Following are specifically referenced for Structural Steel testing):
    - a. ANSI/ASNT CP-189-2011, 'Standard for Qualification and Certification of Nondestructive Testing Personnel'.
    - b. ANSI/ASNT SNT-TC-1A-2011, 'Personnel Qualification and Certification in Nondestructive Testing'.
  - 5. American National Standards Institute / American Welding Society (Following are specifically referenced for Structural Steel testing):
    - a. ANSI/AWS D1.1/D1.1M:2015, 'Structural Welding Code - Steel'.
    - b. ANSI/AWS D1.3/D1.3M:2008, 'Structural Welding Code - Sheet Steel'.
    - c. ANSI/AWS D1.4/D1.4M:2011, 'Structural Welding Code - Reinforced Steel'.
  - 6. American Welding Society:
    - a. AWS QC1:2007, 'Standard for AWS Certification of Welding Inspectors'.
  - 7. ASTM International:
    - a. ASTM A36/A36M-14, 'Standard Specification for Carbon Structural Steel.'

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

### 1.3 SUBMITTALS

- A. Action Submittals:
1. Product Data:
    - a. Submit product data and samples, if requested by Architect.
  2. Shop Drawings:
    - a. Shop drawings and calculations, prepared and stamped by structural engineer, shall include, but not be limited to, plans, elevations, and large scale details of typical sections, connections, joining, and accessories.
    - b. Show other fabricated work.

### 1.4 DELIVERY, STORAGE, AND HANDLING

- A. Delivery And Acceptance Requirements:
1. Deliver material to job site at such intervals as to insure uninterrupted progress of Work.
  2. Deliver anchor bolts, bearing plates and other items to be set by other Contractors shall be delivered to site in ample time for installation and with templates and/or setting instructions.
- B. Storage And Handling Requirements:
1. Structural steel shall not be handled until paint has thoroughly dried. Care must be exercised to avoid abrasions and other damage.
  2. Material shall be stocked out of mud and dirt and proper drainage shall be provided. Structural steel must be protected from damage or soiling by adjacent construction operations.

## PART 2 - PRODUCTS

### 2.1 COMPONENTS

- A. Materials:
1. Angles, Channels, and Miscellaneous steel parts of steel framing systems.
    - a. Meet requirements of ASTM A36/A36M.
    - b. S, HP, C, or TEE shapes in horizontal or vertical application, together with angles, plates, etc, as shown on Drawings.
  2. Columns, Beams 'W' shapes: Meet requirements of ASTM A992/A992M without supplementary requirements.
  3. Pipe Sleeves And Base Plates (Rostrum Riser Handrail):
    - a. 2 inch (50 mm) diameter pipe sleeve welded to base plate. Allow 1/2 inch (12.7 mm) minimum of grout around perimeter of pipe. Field verify sleeve length.



- b. Cap bottom of sleeve forming closure as shown on Contract Drawings.
  - c. 8 inch (200 mm) x 16 inches (400 mm) x 1/4 inch (6.4 mm) steel base plate (expansion anchor bolts provide in Section 03 1511 'Concrete Anchors And Inserts').
- B. Fabrication:
- 1. Requirements: Structural metal shall be product of domestic mill.
  - 2. ANSI/AISC 360 shall serve as minimum standard.
  - 3. Fabricate items to be embedded in concrete or masonry according to approved details of work to be connected.
- C. Finishes: Shop prime structural steel.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

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

**END OF SECTION**

**SECTION 05 5215****STAINLESS STEEL HANDRAILS****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
  - 1. Furnish and install stainless steel handrails as described in Contract Documents:
    - a. Rostrum Ramp Riser Handrail.
- B. Products Furnished But Not Installed Under This Section:
  - 1. Anchoring sleeves in concrete for stainless steel pipe handrails.
- C. Related Requirements:
  - 1. Section 05 0523: 'Metal Fastening' for quality of welding.
  - 2. Section 06 1100: 'Wood Framing' for blocking for pipe handrail brackets.
  - 3. Section 06 4115: 'Rostrum Casework' for wood handrail attached to Rostrum Riser Handrail.
- D. Products Not Furnished And Not Installed Under This Section:
  - 1. Rostrum Ramp Riser Handrail pipe sleeves, base plates and anchor bolts.
- E. Related Requirements:
  - 1. Section 03 1511: 'Concrete Anchors And Bolts' for Rostrum Riser Handrail base plate expansion bolts as shown on Contract Drawings.
  - 2. Section 05 1200: 'Structural Steel Framing' for Rostrum Riser Handrail stainless posts to be set into metal pipe sleeves as shown on Contract Drawings.

**1.2 REFERENCES**

- A. Definitions:
  - 1. Non-magnetic Stainless Steel: Austenitic grade of stainless steel with low magnetic permeabilities and shows almost no response to a magnet when in annealed condition.
  - 2. Non-shrink Grout: Structural grout used for filling voids between elements that is formulated with cement, fine aggregates and admixtures. Admixtures are used to provide expansive properties of the material during curing. This expansion counteracts the natural tendency of cement grouts to shrink during curing.
  - 3. Peened: Nonslip textured gripping surface that is much easier to hold on to.
  - 4. Stainless Steel: Stainless steels are alloys of iron to which at least 10 percent chromium has been added to increase corrosion resistance and will not rust when exposed to weather. To obtain greater corrosion resistance, more nickel and chromium are added to the alloy. Along with iron and chromium, all stainless steels contain some carbon to make it stronger.
    - a. Austenitic Stainless Steel: Most popular of the stainless steels because of their ductility, ease of working and good corrosion resistance.
    - b. Stainless Steel Alloys:
      - 1) Type 304 (UNS S30400): Austenitic stainless steel with non-magnetic properties in annealed condition that provide good corrosion resistance to both chemical and atmospheric exposures, with high resistance to oxidations. Most common and widely used stainless steel.
- B. Reference Standards:
  - 1. ASTM International:
    - a. ASTM C1107/C1107M-14, 'Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink)'.

### 1.3 SUBMITTALS

#### A. Action Submittals:

1. Shop Drawings: Show fabrication and installation of handrails and railings including floor plans, elevations, sections, details of components, and attachments to other elements of The Work.

## PART 2 - PRODUCTS

### 2.1 ASSEMBLIES

#### A. Materials:

1. Pipe Sleeves: 2 inch (50 mm) diameter by 6 to 9 inch (150 to 225 mm) long non-magnetic stainless steel.
  - a. Handrails to Platform.
    - 1) Brackets, Flanges, Fittings, And Anchors:
      - a) Provide standard wall brackets, flanges, miscellaneous fittings, and anchors for connection of handrails and railings to other construction.
      - b) Provide inserts and other anchorage devices for connecting handrails and railing systems to concrete or masonry work.
2. Rostrum Riser Handrail (floor mounted).
  - a. Stainless steel bar.
  - b. Stainless steel mounting plate for hardwood handrail.
  - c. Sizes and configurations as indicated on Contract Drawings.

#### B. Fabrication:

1. Preassemble railing systems in shop to greatest extent possible to minimize field splicing and assembly.
2. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation. Use connections that maintain structural value of joined pieces.
3. Grind smooth welded joints and buff welds to same appearance as remainder of railing.
4. Form curves by bending pipe in jigs to produce uniform curvature for each configuration required. Maintain cylindrical cross-section of pipe throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of pipe.
5. Return pipe ends of wall mounted handrails into wall.
6. Welded Connections:
  - a. Fabricate railing system and handrail connections by welding.
  - b. Weld corners and seams continuously to comply with following:
    - 1) Use materials and methods that minimize distortion and develop of metals.
    - 2) At tee and cross intersections, notch ends of intersecting members to fit contour of pipe to which end is joined and weld all around.
    - 3) At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and so contours of welded surfaces match adjacent surfaces.

### 2.2 ACCESSORIES

#### A. Rail Setting Grout:

1. Commercial non-shrink grout conforming to requirements of ASTM C1107, Type B or Type C.
2. Type Two Acceptable Manufacturers:
  - a. Normal Construction Grout A by Bonsal American, Charlotte, NC [www.bonsal.com](http://www.bonsal.com).
  - b. Advantage 1107 Grout by Dayton Superior Specialty Chemicals, Kansas City, KS [www.daytonsuperiorchemical.com](http://www.daytonsuperiorchemical.com).
  - c. NS Grout by Euclid Chemical Co, Cleveland, OH [www.euclidchemical.com](http://www.euclidchemical.com)
  - d. 5 Star Special Grout 110 by Five Star Products Inc, Fairfield, CT [www.fivestarprouducts.com](http://www.fivestarprouducts.com).
  - e. Duragrout by L&M Construction Chemicals Inc, Omaha, NE [www.lmcc.com](http://www.lmcc.com).

- f. Sonneborn / BASF Building Systems, Shakopee, MN [www.chemrex.com](http://www.chemrex.com).
- g. Tamms Grout 621 by TAMMS Industries, Mentor, OH [www.tamms.com](http://www.tamms.com).
- h. U S Spec MP Grout by U S Mix Products Co, Denver, CO [www.usspec.com](http://www.usspec.com).
- i. CG-86 Grout by W R Meadows, Hampshire, IL [www.wrmeadows.com](http://www.wrmeadows.com).
- j. Equal as approved by Architect before use. See Section 01 6200.

### **PART 3 - EXECUTION**

#### **3.1 INSTALLATION**

- A. Touch up field welds to match finished material.

**END OF SECTION**

**DIVISION 06: WOOD, PLASTICS, AND COMPOSITES**

**06 0500 COMMON WORK RESULTS OF WOOD, PLASTICS, AND COMPOSITES**

06 0573 PRESERVATIVE WOOD TREATMENT

**06 1000 ROUGH CARPENTRY**

06 1011 WOOD FASTENINGS  
06 1100 WOOD FRAMING  
06 1636 WOOD PANEL PRODUCT SHEATHING

**06 2000 FINISH CARPENTRY**

06 2001 COMMON FINISH CARPENTRY REQUIREMENTS  
06 2210 MISCELLANEOUS WOOD TRIM

**06 4000 ARCHITECTURAL WOODWORK**

06 4001 COMMON ARCHITECTURAL WOODWORK REQUIREMENTS  
06 4005 PLASTIC LAMINATE  
06 4115 ROSTRUM CASEWORK  
06 4216 FLUSH WOOD PANELING  
06 4313 WOOD STAIRS  
06 4512 ARCHITECTURAL WOODWORK WOOD TRIM

END OF TABLE OF CONTENTS

**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](http://www.wolmanizedwood.com).
- b. Hoover Treated Wood Products, Thomson, GA [www.frtw.com](http://www.frtw.com).
- c. Osmose Inc, Griffin, GA [www.osmose.com](http://www.osmose.com).
- d. U S Borax Inc, Valencia, CA [www.borax.com/wood](http://www.borax.com/wood).
- e. Viance LLC, Charlotte, NC [www.treatedwood.com](http://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. Section 03 1511: 'Concrete Anchors and Inserts' for Quality of Anchors and Inserts.
  - 2. Section 05 0523: 'Metal Fastenings' for Quality of bolts used for Rough Carpentry.
  - 3. Furnishing and installing of other fasteners are specified in individual Sections where installed.

**1.2 REFERENCES**

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

**1.3 SUBMITTALS**

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

**PART 2 - PRODUCTS****2.1 MANUFACTURED UNITS**

- A. Description:
  - 1. Nail Terminology:



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

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

**B. Materials:**

**1. Fasteners:**

**a. General:**

- 1) Fasteners for preservative treated and fire-retardant-treated wood shall be of hot dipped zinc-coated galvanized steel, stainless steel, silicon bronzed, or copper. Coating weights for zinc-coated fasteners shall be in accordance with ASTM A153/A153M.

**b. Nails:**

- 1) Meet requirements of ASTM F1667.  
 2) Unless noted otherwise, nails listed on Drawings or in Specifications shall be common nail diameter, except 16d nails, which shall be box diameter.

**c. Wood Screws:**

**1) SDS Screws:**

- a) Category Four Approved Products. See Section 01 6200 for definitions of categories.

(1) SDS Screws by Simpson Strong Tie Co, Dublin, CA [www.strongtie.com](http://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](http://www.us.hilti.com).  
 b) Redhead Division of ITW, Wood Dale, IL [www.itw-redhead.com](http://www.itw-redhead.com) and Markham, ON [www.itwconstruction.ca](http://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](http://www.kcmetals.com).  
 2) Simpson Strong Tie Co, Dublin, CA [www.strongtie.com](http://www.strongtie.com).  
 3) United Steel Products Co Inc (USP), Montgomery, MN [www.uspconnectors.com](http://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. Miscellaneous structural steel elements.
  - 2. Structural composite lumber.
  - 3. Wood panel product sheathing.
- C. Related Requirements:
  - 1. Section 05 1223: 'Structural Steel For Buildings' for furnishing of miscellaneous structural steel.
  - 2. Section 06 0573: 'Preservative Wood Treatment' for quality of preservative wood treatment.
  - 3. Section 06 1636: 'Wood Panel Product Sheathing' for:
    - a. Pre-installation conference held jointly with Section 06 1100.
  - 4. Section 06 1712: 'Structural Composite Lumber - SCL'.
  - 5. Sections under 06 4000 Heading: 'Architectural Woodwork' for wall blocking requirements.
  - 6. Sections in Division 07: Roofing membranes for related blocking, wood nailers, and curbs.
  - 7. Section 08 4113: 'Aluminum-Framed Entrances And Storefronts':
    - a. Pre-installation conference held jointly with Section 06 1100.

**1.2 REFERENCES**

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

**1.3 ADMINISTRATIVE REQUIREMENTS**

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

**1.4 DELIVERY, STORAGE, AND HANDLING**

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

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

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

- A. Wood Framing List:
  - 1. Provide Category Three Approved Suppliers with wood framing list.
- B. Dimension Lumber:
  - 1. Design Criteria:
    - a. Meet requirements of PS 20 and National Grading Rules for softwood dimension lumber.
    - b. Bear grade stamp of WWPA, SPIB, or other association recognized by American Lumber Standards Committee identifying species of lumber by grade mark or by Certificate of Inspection.
    - c. Lumber 2 inches (50 mm) or less in nominal thickness shall not exceed 19 percent in moisture content at time of fabrication and installation and be stamped 'S-DRY', 'K-D', or 'MC15'.
    - d. Preservative Treated Plates / Sills:
      - 1) 2x4 (38 mm by 64 mm): Standard and better Douglas Fir, Southern Pine, or HemFir, or StrandGuard by iLevel by Weyerhaeuser Boise, ID [www.ilevel.com](http://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](http://www.ilevel.com). (LSL 1.3 E).
- C. Posts, Beams, And Timbers 5 Inches by 5 Inches (125 mm by 125 mm) And Larger:
  - 1. Design Criteria:
    - a. No. 1 or better Douglas Fir or Southern Pine.
- D. Lumber Ledgers:
  - 1. Design Criteria:
    - a. No. 2 Douglas Fir-Larch, or Southern Pine.
- E. See Contract Drawings for additional requirements.

### **2.2 ACCESSORIES**

- A. Blocking:
  - 1. Sound lumber without splits, warps, wane, loose knots, or knots larger than 1/2 inch (13 mm).
- B. Furring Strips:
  - 1. Utility or better.
- C. Sill Sealer:
  - 1. Closed-cell polyethylene foam, 1/4 inch (6 mm) thick by width of plate.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION**

- A. General:

1. Use preservative treated wood for wood members in contact with concrete or masonry, including wall, sill, and ledger plates, door and window subframes and bucks, etc.
- B. Interface With Other Work:
  1. Coordinate with other Sections for location of blocking required for installation of equipment and building specialties. Do not allow installation of gypsum board until required blocking is in place.
  2. Where manufactured items are to be installed in framing, provide rough openings of dimensions within tolerances required by manufacturers of such items. Confirm dimensions where not shown on Contract Drawings.
- C. Tolerances:
  1. Walls:
    - a. 1/4 inch (6 mm) in 20 feet (6 meters), non-cumulative in length of wall.
    - b. 1/8 inch (3 mm) in 10 feet (3 meters) with 1/4 inch (6 mm) maximum in height of wall.
    - c. Distances between parallel walls shall be 1/4 inch (6 mm) maximum along length and height of wall.
- D. Floors:
  1. Place with crown side up.
  2. Provide accurately fitted header and trimmer joists of same size as regular joists around floor openings, unless detailed otherwise, and support by steel joist hangers.
  3. Double joists under partitions that parallel run of joists.
- E. Accessory / Equipment Mounting And Gypsum Board Back Blocking (nailers) for Wood Framing):
  1. Furnish and install blocking in wood framing required for hardware, specialties, equipment, accessories, and mechanical and electrical items, etc.
  2. Furnish and install back blocking in wood framing required for joints in gypsum wallboard.
    - a. Install back blocking between I-joist framing members with equivalent of Simpson Z2 clips attached with four 10d x 1-1/2 inches (38 mm) nails at each end, two into 'I' joist and two into blocking.
    - b. Attach back blocking at trusses, stick framing, or walls with two 10d nails in each end of each piece of blocking.
- F. Accessory / Equipment Mounting And Standing & Running Trim Blocking (nailers) for Metal Framing):
  1. Furnish and install blocking in wood framing required for hardware, specialties, equipment, accessories, and mechanical and electrical items, etc.
  2. Attach blocking not installed with clips with two fasteners in each end of each piece of blocking.
- G. Furring Strips:
  1. On Wood or Steel: Nail or screw as required to secure firmly.
    - a. Ceiling:
      - 1) Attach furring strips to the underside of structural elements with #8 wood screws, of length to penetrate wood framing 1 inch (25 mm) minimum.

**END OF SECTION**

**SECTION 06 1636****WOOD PANEL PRODUCT SHEATHING****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
  - 1. Furnish and install wood panel product sheathing required for floors as described in Contract Documents.
- B. Related Requirements:
  - 1. Section 01 0000: 'General Requirements':
  - 2. Section 06 1100: 'Wood Framing' for:
    - a. Pre-installation conference held jointly with Section 06 1636.

**1.2 REFERENCES**

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

**1.3 ADMINISTRATIVE REQUIREMENTS**

- A. Pre-Installation Conference:
  - 1. Participate in pre-installation conference as specified in Section 06 1100.
  - 2. In addition to agenda items specified in Section 01 3100 and Section 06 1100, review following:
    - a. Review Section 01 4523 for Testing and Inspection administrative requirements and responsibilities and Field Quality Control inspection required of this section.
- B. Scheduling:
  - 1. Notify Testing Agency and Architect twenty-four (24) hours minimum before placing sheathing.

**1.4 DELIVERY, STORAGE, AND HANDLING**

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

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

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Performance:
1. Design Criteria:
    - a. Meet requirements of PS 1, PS 2, or PRP-133 (TECO). Except where plywood is specifically indicated on Contract Drawings, oriented strand board (OSB) is acceptable.
- B. Sheathing:
1. Sheathing:
    - a. Sheathing shall bear grade stamp from American Plywood Association (APA) or equal grading organization.
    - b. Sheathing shall not exceed 18 percent moisture content when fabricated or more than 19 percent when installed in Project.
    - c. Sheathing 23/32 inch (18.3 mm) thick and thicker used for single-layer subflooring shall be tongue and groove.
    - d. Sheathing used for same purpose shall be of same thickness. In all cases, thickness specified is minimum required regardless of span rating.
    - e. Minimum span ratings for given thicknesses shall be as follows:

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

### 2.2 ACCESSORIES

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

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. General:
1. Top of nail heads shall be flush with sheathing surface.
  2. Use of edge clips to provide spacing between sheathing panels is acceptable.
- B. Floor Sheathing:
1. Floor Sheathing: 1 Layer Subflooring (floors accessible to public).
    - a. Apply bead of glue to structural supports. Lay face grain / strength axis across supports and with panel continuous over two supports minimum.
    - b. Allow expansion gap of at least 1/2 inch (12.5 mm) at walls.

- c. Tongue and Groove.
  - d. Nail Spacing.
    - 1) As indicated on Contract Drawings.
  - e. Thickness:
    - 1) As indicated on Contract Drawings.
  - f. Do not install any piece of bottom layer floor sheathing with shortest dimension of less than 24 inches (600 mm).
2. Subflooring: 2 Layers Subflooring.
- a. Bottom layer:
    - 1) Glue subflooring layers together along lines of structural supports.
    - 2) Leave 1/32 inch (1 mm) gap at side and end joints.
    - 3) Nail as per floor sheathing nailing requirements.
    - 4) Thickness:
      - a) 19/32 inch actual (15 mm) minimum thickness, except where specifically noted otherwise.
    - 5) Do not install any piece of single layer floor sheathing with shortest dimension of less than 24 inches (600 mm).
  - b. Top layer:
    - 1) Stagger joints of second layer subflooring so they do not line up with joints of first layer subflooring, but do align with intermediate structural member (for example, align with field nailing of bottom subflooring layer).
    - 2) Glue subflooring layers together along lines of structural supports.
    - 3) Leave 1/32 inch (1 mm) gap at side and end joints.
    - 4) Nail at 6 inch (150 mm) centers on ends and 12 inch (300 mm) centers on intermediate structural members.
    - 5) Thickness:
      - a) 19/32 inch actual (15 mm) minimum thickness, except where specifically noted otherwise.
    - 6) Do not install any piece of single layer floor sheathing with shortest dimension of less than 24 inches (600 mm).

### 3.2 FIELD QUALITY CONTROL

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

### 3.3 PROTECTION

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

**END OF SECTION**



**SECTION 06 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.
- B. Products Installed But Not Furnished Under This Section:
1. Architectural Woodwork.
  2. Casings, stops, handrails, and jambs.
  3. Hardwood Base.
  4. Hardwood Trim for wall covering.
  5. Miscellaneous Wood Trim.
  6. Rostrum Casework.
  7. Rostrum Ramp Handrail.
  8. Selected Building Specialties.
  9. Selected Equipment.
  10. Wood Stairs.
  11. Wood Veneer Paneling.
  12. Miscellaneous as specified elsewhere.
- C. Related Requirements:
1. Section: 05 5215: 'Stainless Steel Handrails' for Rostrum Riser Handrail and Rostrum Ramp Handrail.
  2. Section 06 1100: 'Wood Framing' for furring and blocking.
  3. Section 06 1636: 'Wood Panel Product Sheathing'.
  4. Section 06 2210: 'Miscellaneous Wood Trim'.
    - a. Wood Trim.
  5. Sections under 06 4000 Heading: Furnishing of Architectural Woodwork.
    - a. Section 06 4001: 'Common Architectural Woodwork Requirements':
      - 1) Approved Fabricators.
      - 2) Quality of wood materials to be used in Finish Carpentry.
    - b. Section 06 4005: 'Plastic Laminate' for countertops.
    - c. Section 06 4114: 'Wood-Veneer-Faced Architectural Cabinets'.
      - 1) Custom Casework:
    - d. Section 06 4115: 'Rostrum Casework'.
    - e. Section 06 4216: 'Flush Wood Paneling'.
    - f. Section 06 4313: 'Wood Stairs'.
    - g. Section 06 4512: 'Architectural Woodwork Wood Trim'.
  6. Section 07 9213: 'Elastomeric Joint Sealants' for quality of sealants, submittal and installation requirements.

**1.2 REFERENCES**

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

1. Grade: Unless otherwise noted, this term means Grade rules for Economy, Custom, and/or Premium Grade:
  - a. Economy Grade: The lowest acceptable grade in both material and workmanship requirements, and is for work where price outweighs quality considerations.
  - b. Custom Grade: Typically specified for and adequately covers most high-quality architectural woodwork, providing a well-defined degree of control over a project's quality of materials, workmanship, or installation.
  - c. Premium Grade: The highest Grade available in both material and workmanship where the highest level of quality, materials, workmanship, and installation is required.

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

#### **A. Manufacturers:**

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

B. Glue: Waterproof and of best quality.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

#### **A. Verification Of Conditions:**

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

### **3.2 PREPARATION**

#### **A. Surface Preparation:**

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

- B. 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.
- C. Installation for Accessories:

**END OF SECTION**

**SECTION 06 2210****MISCELLANEOUS WOOD TRIM****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
  - 1. Furnish and install wood trim not specified elsewhere as described in Contract Documents.
- B. Related Requirements:
  - 1. Section 06 1100: 'Wood Framing' for wall blocking required for Wood Trim.
  - 2. Section 06 2001: 'Common Finish Carpentry Requirements':
    - a. Installation of Wood Trim.
  - 3. Section 06 4001: 'Common Architectural Woodwork Requirements':
    - a. Approved Fabricators.
    - b. General standards for materials and fabrication of Architectural Woodwork.
  - 4. Section 06 4216: 'Flush Wood Paneling'.
  - 5. Section 06 4512: 'Architectural Woodwork Wood Trim'.
  - 6. Section 09 9324: 'Interior Clear-Finished Hardwood'.

**1.2 REFERENCES**

- A. Association Publications:
  - 1. Architectural Woodwork Institute / Architectural Woodwork Manufacturers Association of Canada / Woodwork Institute, 46179 Westlake Drive, Suite 120, Potomac Falls, VA [www.awinet.org](http://www.awinet.org).
    - a. Architectural Woodwork Standards (AWS), 2nd Edition, 2014.
- B. Definitions:
  - 1. Grade: Unless otherwise noted, this term means Grade rules for Economy, Custom, and/or Premium Grade:
    - a. Custom Grade: Typically specified for and adequately covers most high-quality architectural woodwork, providing a well-defined degree of control over a project's quality of materials, workmanship, or installation.
  - 2. Plain-Sawn: A hardwood figure developed by sawing a log lengthwise at a tangent to the annual growth rings. It appears as U-shaped or straight markings in the board's face.

**1.3 SUBMITTALS**

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

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

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

- A. Design Criteria:
  1. General:
    - a. Meet requirements of Section 06 4001 for general standards for materials and fabrication of Architectural Woodwork.
  2. Clear Finished Hardwood:
    - a. Match materials specified in Section 06 4512.
    - b. Match finish specified in Section 06 4512 and match Owner selected sample as specified in Section 09 9324.
  3. Clear Finished Paneling: Match materials specified in Sections 06 4216.
  4. Opaque Finished Hardwood: Hardwood allowed by AWS Custom Grade.
  5. Opaque Finished Softwood: Solid stock Pine, C or better, S4S.
  6. Opaque Finished Paneling: Paneling allowed by AWS Custom Grade.

### **2.2 SOURCE QUALITY CONTROL**

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

## **PART 3 - EXECUTION: Not Used**

**END OF SECTION**

**SECTION 06 4001****COMMON ARCHITECTURAL WOODWORK REQUIREMENTS****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
  - 1. General standards for materials and fabrication of Architectural Woodwork and for hardware associated with Architectural Woodwork.
- B. Related Requirements:
  - 1. Section 06 1100: 'Wood Framing' for furring and blocking.
  - 2. Section 06 2001: 'Common Finish Carpentry Requirements' for Installation.
  - 3. Section 06 2210: 'Miscellaneous Wood Trim'.
  - 4. Section 06 4005: 'Plastic Laminate'.
  - 5. Section 06 4115: 'Rostrum Casework'.
  - 6. Section 06 4512: 'Architectural Woodwork Wood Trim'.
  - 7. Section 06 6001: 'Miscellaneous Plastic Fabrications'.
  - 8. 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](http://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****1.4 SUBMITTALS**

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

## 1.5 QUALITY ASSURANCE

- A. Qualifications: Requirements of Section 01 4301 applies, but not limited to following:
1. Fabricator:
    - a. Fabricator Firm specializing in performing work of this section.
      - 1) Firm experience in supplying products indicated for this Project.
      - 2) Firm with sufficient production capacity to produce required units.
      - 3) Firm will comply with specifications and Contract Documents for this Project.
      - 4) Minimum five (5) years experience in Woodwork installations.
      - 5) Minimum five (5) satisfactorily completed installations in past three (3) years of projects similar in size, scope, and installation procedures required for this project before bidding.
    - b. Upon request by Architect or Owner, submit documentation.

## 1.6 DELIVERY, HANDLING, AND STORAGE

- A. Delivery And Acceptance Requirements:
1. Assemble architectural woodwork at Architectural Woodwork Fabricator's plant and deliver ready for erection insofar as possible.
  2. Protect architectural woodwork from moisture and damage while in transit to job site.
  3. Report damaged materials received within two (2) days from delivery at project site.
- B. Storage And Handling Requirements:
1. Unload and store in place where it will be protected from moisture and damage and convenient to use.

## PART 2 - PRODUCTS

### 2.1 FABRICATORS

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

### 2.2 ASSEMBLIES

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

- e) Normal grain variations, such as cats eye, bird's eye, burl, curl, and cross grain are not considered defects.
- 3) Use maximum lengths possible, but not required to exceed 10 feet (3 meters) without joints. No joints shall occur closer than 72 inches (1 800 mm) in straight runs exceeding 18 feet (3 600 mm). Runs between 18 feet (3 600 mm) and 10 feet (3 meters) may have no more than one joint. No joints shall occur within 72 inches (1 800 mm) of outside corners nor within 18 inches (450 mm) of inside corners.
- 4) Moisture content shall be six (6) percent maximum at fabrication. No opening of joints due to shrinkage is acceptable.

**B. Fabrication:**

1. Follow Architectural Woodwork Standards (AWS) for fabrication of Architectural Woodwork.
2. Tolerances:
  - a. No planer marks (KCPI) allowed. Sand wood members and surfaces with 100 grit or finer.
  - b. Maximum Gap: None allowed.
  - c. Flushness Variation: 0.015 inch (0.4 mm) maximum.
  - d. Sanding Cross Scratches: 1/4 inch (6 mm) maximum.
  - e. Plug screw holes. Screw locations not to be visible beyond 18 inches (450 mm).
3. Fabricate work in accordance with measurements taken on job site.
4. 'Ease' sharp corners and edges of exposed members to promote finishing and protect users from splinters. 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 at Rostrum and Ramp Railing.
- B. Related Requirements:
  - 1. Section 06 2001: 'Common Finish Carpentry Requirements':
  - 2. Section 06 4001: 'Common Architectural Woodwork Requirements':
    - a. General standards for materials and fabrication of Architectural Woodwork.

**1.2 REFERENCES**

- A. Association Publications:
  - 1. Architectural Woodwork Institute / Architectural Woodwork Manufacturers Association of Canada / Woodwork Institute, 46179 Westlake Drive, Suite 120, Potomac Falls, VA [www.awinet.org](http://www.awinet.org).
    - a. Architectural Woodwork Standards (AWS), 2nd Edition, 2014.
- B. Definitions:
  - 1. Flame Spread: The propagation of flame over a surface.
    - a. Flame Spread Index: The numerical value assigned to a material tested in accordance with ASTM E84 or UL 723.
  - 2. 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.
  - 3. High-Pressure Decorative Laminate (HPDL): Laminated thermosetting decorative sheets intended for decorative purposes. Also known as Plastic Laminate.
  - 4. Smoke-Developed Index: The numerical value assigned to a material tested in accordance with ASTM E84 or UL 723.
- C. Reference Standards:
  - 1. ASTM International:
    - a. ASTM E84-18, 'Standard Test Method for Surface Burning Characteristics of Building Materials'.
    - b. ASTM E162-15a, 'Standard Test Method for Surface Flammability of Materials Using a Radiant Heat Energy Source'.
  - 2. Kitchen Cabinet Manufacturers Association:
    - a. ASTM/KCMA A161.1-2012, 'Performance And Construction Standards For Kitchen And Vanity Cabinets'.
  - 3. National Electrical Manufacturer's Association / American National Standards Institute:
    - a. ANSI/NEMA LD-3-2005, 'High Pressure Decorative Laminates'.
  - 4. Underwriters Laboratories, Inc.:
    - a. UL 723: 'Standard for Safety Test for Surface Burning Characteristics of Building Materials'; (10th Edition).

**1.3 SUBMITTALS**

- A. Action Submittals:
  - 1. Product Data:

- a. Color selections.
  - b. Manufacturer's technical data sheet.
- B. Informational Submittals:
- 1. Certificates:
    - a. Provide Manufacturer's certification of compliance to ANSI/NEMA LD 3.
  - 2. Test And Evaluation Reports:
    - a. Test reports: Certified test reports showing compliance with specified performance characteristics and physical properties for Quality Assurance if requested by Owner or Architect.
- C. Closeout Submittals:
- 1. Include following in Operations And Maintenance Manual specified in Section 01 7800:
    - a. Record Documentation:
      - 1) Manufacturers documentation:
        - a) Manufacturer's literature for plastic laminate.
        - b) Color selections.

## 1.4 QUALITY ASSURANCE

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

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Fabricators:
- 1. Approved Fabricators. See Section 06 4001 for Category Three Approved Fabricators.
- B. Manufacturers:
- 1. Type Two Acceptable Manufacturers:
    - a. Formica, Cincinnati, OH [www.formica.com](http://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](http://www.nevamar.com).
    - c. Pionite Decorative Surfaces, Auburn, ME [www.pionite.com](http://www.pionite.com).
    - d. WilsonArt, Temple, TX [www.wilsonart.com](http://www.wilsonart.com) or WilsonArt International Inc, Mississauga, ON (905) 565-1255.
    - e. Equal as approved by Architect before bidding. See Section 01 6200.
- C. Plastic Laminates:
- 1. Design Criteria:
    - a. Balancing Material: BK 20.
    - b. AWS Quality Grade: Premium.
  - 2. Assemblies:
    - a. Adhesives for other than post-formed types shall be spray grade, high heat resistant, neoprene contact adhesive.
  - 3. Category Four Approved Colors. See Section 01 6200 for definition of Categories. Match existing Rostrum Rail Plastic Laminate from the following:
    - a. Formica.

- b. Nevamar.
- c. Pionite.
- d. WilsonArt.

**PART 3 - EXECUTION: Not Used**

**END OF SECTION**

**SECTION 06 4115****ROSTRUM CASEWORK****PART 1 - GENERAL****1.1 SUMMARY**

- A. Products Furnished But Not Installed Under This Section:
1. Rostrum casework as described in Contract Documents consisting of the following:
    - a. Modification of existing Chapel Pulpit (with adjustable lift mechanism).
    - b. Modesty Rail.
    - c. Ramp Landing Sidewall.
    - d. Riser Steps Sidewall.
    - e. Rostrum Riser Handrail (floor mounted).
    - f. Sacrament Table.
    - g. Wood Handrails and Handrail Brackets.
- B. Related Requirements:
1. Section 05 5215: 'Stainless Steel Handrails' for floor mounted Rostrum Riser Handrail and Rostrum Ramp Handrail.
  2. Section 06 1100: 'Wood Framing' for wall blocking required for Rostrum Casework.
  3. Section 06 2001: 'Common Finish Carpentry Requirements':
    - a. Installation of Rostrum Casework.
  4. Section 06 4001: 'Common Architectural Woodwork Requirements':
    - a. Approved Fabricators.
    - b. General standards for materials and fabrication of Architectural Woodwork.
    - c. Action Submittals for shop drawings from Fabricator.
    - d. Field Quality Control Submittals for field dimensions provided to Fabricator from Contractor.
  5. Section 09 9324: 'Interior Clear-Finished Hardwood'.

**1.2 REFERENCES**

- A. Association Publications:
1. Architectural Woodwork Institute / Architectural Woodwork Manufacturers Association of Canada / Woodwork Institute, 46179 Westlake Drive, Suite 120, Potomac Falls, VA [www.awinet.org](http://www.awinet.org).
    - a. Architectural Woodwork Standards (AWS), 2nd Edition, 2014.
- B. Definitions:
1. Face Veneer: The outermost exposed wood veneer surface of a veneered wood door, panel, or other component exposed to view when the project is completed.
  2. 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.
  3. Plain-Sawn: A hardwood figure developed by sawing a log lengthwise at a tangent to the annual growth rings. It appears as U-shaped or straight markings in the board's face.
  4. Running Match: Each panel face is assembled from as many veneer leaves as necessary. Any portion left over from one panel may be used to start the next.
- C. Reference Standards:
1. International Electrotechnical Commission (IEC):
    - a. IEC 60529 (ed. 2.1 b:2001), 'Degrees of protection provided by enclosures (IP Code).
  2. International Organization for Standards (ISO):

- a. ISO 3746:2010, 'Acoustics - Determination of sound power levels and sound energy levels of noise sources using sound pressure - Survey method using an enveloping measurement surface over a reflecting plane'.

### 1.3 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
  1. Coordinate the efforts of the various trades affected by the Work of this Section.
  2. Coordinate completion of 2x6 (50mm x 100mm) wall blocking for rostrum casework.
  3. Coordinate completion of electrical and audio video wiring with rostrum casework.
  4. Coordinate completion of rostrum casework.
- B. Sequencing:
  1. Install rostrum casework after following as been completed:
    - a. Adjacent millwork.
    - b. Adjacent walls and ceilings are finished.

### 1.4 SUBMITTALS

- A. Action Submittals:
  1. Shop Drawings:
    - a. As specified in as specified in Action Submittals in Section 06 4001 'Common Architectural Woodwork Requirements'.
  2. Samples:
    - a. Interior Hardwood for Transparent Finish:
      - 1) Before performing work of this Section, prepare Control Sample, to match sample available from Owner, to be used as finishing standard for interior clear finished hardwood as specified in Section 09 9324.
      - 2) Design Criteria:
        - a) Provide 8 inch by 10 inch (200 mm by 255 mm) sample of Red Oak to match Owner provided stain color selected for Project.
        - b) Control Sample will be used as performance standard for evaluating finish provided.
- B. Informational Submittals:
  1. Source Quality Control Submittals:
    - a. Samples:
      - 1) Interior Hardwood for Transparent Finish:
        - a) Owner will provide Control Sample from project for finish.
  2. Field Quality Control Submittals:
    - a. Field dimensions:
      - 1) Contractor Responsibility:
        - a) Provide field dimensions of Rostrum area to Approved Fabricator as specified in Field Quality Control Submittal in Section 06 4001 'Common Architectural Woodwork Requirements'.
- C. Closeout Submittals:
  1. Include following in Operations And Maintenance Manual specified in Section 01 7800:
    - a. Warranty Documentation:
      - 1) Final, executed copy of Warranty.

### 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Delivery And Acceptance Requirements:
  1. Assemble Rostrum Casework at Architectural Woodwork Fabricator's plant and deliver ready for erection insofar as possible.

2. Protect Rostrum Casework from moisture and damage while in transit to job site.
3. Report damaged materials received.

B. Storage And Handling Requirements:

1. Unload and store in secure place where it will be protected from moisture and damage and convenient to use.

## 1.6 WARRANTY

A. Adjustable Lift Mechanism:

1. Lift Manufacturer's warranty against defects in materials and workmanship.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURED UNITS

A. Description:

1. Rostrum casework consists:
  - a. Chapel Pulpit modifications (with adjustable lift mechanism).
  - b. Modesty Rail.
  - c. Ramp Landing Sidewall.
  - d. Riser Steps Sidewall.
  - e. Rostrum Riser Handrail (floor mounted).
  - f. Wood Handrails and Handrail Brackets.
2. Rostrum casework as described in Contract Documents consisting of the following:
  - a. Moveable Chapel Pulpit (without adjustable lift mechanism) with Side Panels.

B. Design Criteria:

1. AWS Custom Grade is minimum acceptable standard for materials, construction, and installation of architectural woodwork.
2. Interior Hardwood for Transparent Finish. Furnish factory-finish matching Owner selected sample for Rostrum Casework:
  - a. Design Criteria:
    - 1) Factory-finish to match Owner selected sample as specified in Section 09 9324.
  - b. Match existing Project Color Scheme:
    - 1) Control Sample provided by Owner:
      - a) Control Sample will be existing wood item from Project.

C. Materials:

1. Rostrum Casework as described in Contract Documents.
  - a. Material:
    - 1) Solid Wood: Plain sawn Red Oak.
    - 2) Paneling: Panel Product with plain sliced Red Oak veneer.
  - b. Rostrum Rail:
    - 1) Running match construction.
    - 2) Fabricator Option:
      - a) Option A: One (1) 3/4 inch (19 mm) 'A' face veneer panel product both sides.
      - b) Option B: Two (2) 1/2 inch (12.7 mm) 'A' face veneer one side panel product laminated together.
  - c. End (Wing) Supports:
    - 1) No butcher block (edge grain construction) permitted.
2. Wood handrails and brackets.

D. Fabrications:

1. Following Architectural Woodwork Standards (AWS) for fabrication of Rostrum casework.
2. Fabricators:

- a. Approved Fabricators. See Section 06 4001 for Category Three Approved Fabricators.

## 2.2 ACCESSORIES

### A. Adjustable Pulpit Mechanism:

1. Description:
  - a. Lift Mechanism for raising and lowering pulpit / podium lecterns including but not limited to following components:
    - 1) Column assembly.
    - 2) Control box.
    - 3) Control cable.
    - 4) Control relay assembly.
    - 5) Lift Actuator.
2. Design Criteria:
  - a. General:
    - 1) Identification:
      - a) Each unit shall have tag permanently attached giving Model Number and Manufacturer's name, phone number, and address.
    - 2) Service Life:
      - a) Estimated service life of Lift Mechanism shall be one (1) million cycles plus/minus ten (10) percent.
    - 3) Sound:
      - a) Lift mechanism must operate at not more than 48db(A) measured per ISO 3746.
  - b. Dimension Requirements:
    - 1) Provide Lift Mechanism within lectern neck and engage not more than 18 inches (450 mm) and not less than less than 17 inches (430 mm).
    - 2) Provide Lift Mechanism to fit inside lectern (size is based which Manufacturer provided original pulpit mechanism):
      - a) 8-3/4 to 9 inch (222 to 230 mm) square by 18 inch (450 mm).
    - 3) Do not exceed 3 inches (75 mm) minimum or 6 inches (150 mm) maximum space from bottom of lectern to top of pulpit base.
  - c. Safety switch assembly.
  - d. Switches, condensers, etc, shall be only those supplied by Manufacturer.
  - e. Surge Protector.
3. Column Assembly:
  - a. General:
    - 1) Construct Lift Mechanism with inner and outer column.
    - 2) Inner column must be fixed to base plate of Lift Mechanism.
    - 3) Connect outer column to inner column with system of roller bearings to provide vertical motion but limit lateral motion.
  - b. Material:
    - 1) Construct inner and outer column dimensionally stable material for presence of variable humidity levels (typically aluminum).
    - 2) Protect inner and outer column from oxidation with an electrolytic coating such as powder coat paint or anodize.
4. Control Box:
  - a. General:
    - 1) Electrical components of unit shall be UL/ULC, CSA, and/or TUV listed or recognized where such listing or recognition is available.
    - 2) Actuator and power supply must meet requirements of IEC 60529 for IP51 protection.
    - 3) Cut-off mechanism must automatically reset after operation.
  - b. Power Supply:
    - 1) Power supply for operating motor of actuator must be separate from actuator and Lift Mechanism.
    - 2) Power supply mains cable must be available with molded plug end for interface with standard outlets without use of adapters.
    - 3) Power supply must meet worldwide voltage and frequency requirements.
5. Control Cable:

- a. Separate interconnection cables used to connect screw actuator, control switch and power to power supply unit.
  - b. Interconnection cables must be uniquely sized, keyed, and pinned so that incorrect connection to power supply unit cannot be completed.
  - c. Locking mechanism must be supplied to prevent interconnection cables from being removed from the power supply without disabling lock mechanism.
6. Lifting Actuator:
- a. Provide movable outer column with screw type actuator.
    - 1) Outer column must not be physically connected to screw type actuator.
  - b. Screw Type Actuator:
    - 1) Provide sealed and lubricated for life of actuator.
    - 2) Provide end of stroke limit switches contained with actuator.
    - 3) Provide brake mechanism to prevent screw from back driving under load.
    - 4) Actuator must extend and/or retract at minimum speed of 1/2 inch (12.7 mm) per second.
7. Safety Switch Assembly:
- a. Provide adjustable cut-off mechanism to limit weight that Lift Mechanism can carry during extension:
    - 1) Lift Mechanism to carry total weight of 55 lb (24.9 kg) to 65 lb (29.5 kg) including weight of pulpit lectern and neck assembly.
  - b. Provide adjustable cut-off mechanism to limit force that may be transmitted to an obstruction object during retraction:
    - 1) Force should not exceed 3 lbs (1.36 kg) when measured between top of pulpit cabinet and front left corner of lectern.
8. Category Four Approved Product. See Section 01 6200 for definitions of Categories and Section 01 4301 for Qualification Requirements:
- a. Manufacturer Contact List:
    - 1) Mark Eaton LLC, American Fork, UT [www.markeatonllc.com](http://www.markeatonllc.com).
      - a) Contact Information: Mark Eaton (801) 756-5639.
    - 2) Techna-Base, Inc., Pleasant Grove, UT.
      - a) Contact Information: Dewey Lundahl (801) 785-6477 or (801) 361-2289 (cell).
  - b. Approved Product:
    - 1) Mark Eaton:
      - a) Model LDS2005A by Mark Eaton.
    - 2) Techna-Base.
      - a) Model PL-120 (120 VAC) or Model PL-220 (220 VAC).

### 2.3 SOURCE QUALITY CONTROL

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

### PART 3 - EXECUTION: Not Used

**END OF SECTION**



**SECTION 06 4216****FLUSH WOOD PANELING****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
  - 1. Quality requirements for AWS custom grade hardwood veneer paneling.
- B. Related Requirements:
  - 1. Section 06 4001: Common Architectural Woodwork Requirements.

**1.2 REFERENCES**

- A. Association Publications:
  - 1. Architectural Woodwork Institute / Architectural Woodwork Manufacturers Association of Canada, 46179 Westlake Drive, Suite 120, Potomac Falls, VA [www.awinet.org](http://www.awinet.org).
    - a. Architectural Woodwork Standards (AWS), 2nd Edition, 2014.
- B. Definitions:
  - 1. Balanced-Match: A common term in book-matching that uses two or more leaves of uniform width on the face of a panel, wherein the two outermost leaves in a panel or face are of the same width.
  - 2. Book-Match: Matching between adjacent veneer leaves on one panel face. Every other piece of veneer is turned over so that the adjacent leaves are "opened" as two pages in a book. The fibers of the wood, slanting in opposite directions in the adjacent leaves, create a characteristic light and dark effect when the surface is seen from an angle.
  - 3. Face Veneer: The outermost exposed wood veneer surface of a veneered wood door, panel, or other component exposed to view when the project is completed.
  - 4. Grade: Unless otherwise noted, this term means Grade rules for Economy, Custom, and/or Premium Grade:
    - a. Custom Grade: Typically specified for and adequately covers most high-quality architectural woodwork, providing a well-defined degree of control over a project's quality of materials, workmanship, or installation.
  - 5. Plain-Sawn: A hardwood figure developed by sawing a log lengthwise at a tangent to the annual growth rings. It appears as U-shaped or straight markings in the board's face.

**PART 2 - PRODUCTS****2.1 MATERIALS**

- A. AWS Custom Grade Hardwood Panels:
  - 1. Panel Product 3/8 inch (9.5 mm) thick.
  - 2. For Transparent Finishes:
    - a. Face Veneer: Plain sliced Red Oak meeting requirements of AWS Grade A, 1/50 inch (0.5 mm) thick minimum immediately before finishing.
    - b. Balancing Backer Veneer: Any compatible veneer.
    - c. Matching of veneer leaves: Bookmatch.
    - d. Veneer matching within panel face: Center and balanced matched.
    - e. Veneer matching from panel to panel: Sequence match.
  - 3. For Opaque Finishes:
    - a. Face Veneer: 1/16 inch (1.6 mm) thick Birch or Poplar, or MDO.
    - b. Balancing Backer Veneer: Any compatible veneer.

- B. Solid trim shall be plain sawn wood to match face veneer.

**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 05 5214: 'Galvanized Steel Pipe and Tube Railings' for custom metal handrails.
  - 2. Section 06 1100: 'Wood Framing' for stair stringers.
  - 3. Section 06 1636: 'Wood Panel Product Sheathing'.
  - 4. Section 06 2001: 'Common Finish Carpentry Requirements' for Installation.
  - 5. Section 06 4001: 'Common Architectural Woodwork Requirements'.
  - 6. Section 06 4115: 'Rostrum Casework' for wood handrails at Rostrum.

**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 06 4512****ARCHITECTURAL WOODWORK WOOD TRIM****PART 1 - GENERAL****1.1 SUMMARY**

- A. Products Furnished But Not Installed Under This Section:
1. Casings, stops, handrails, and jambs.
  2. Chair rails.
  3. Hardwood base.
  4. Hardwood handrail at Rostrum Riser and/or Rostrum Ramp.
  5. Hardwood trim for wall covering.
- B. Related Requirements:
1. Section 05 5215: Stainless steel used in Rostrum Riser Handrail and Rostrum Ramp Handrail.
  2. Section 06 1100: 'Wood Framing' for wall blocking required for Wood Trim.
  3. Section 06 2001: 'Common Finish Carpentry Requirements':
    - a. Installation of Wood Trim.
  4. Section 06 2210: Remaining Wood Trim.
  5. Section 06 4001: 'Common Architectural Woodwork Requirements':
    - a. General standards for materials and fabrication of Architectural Woodwork.
  6. Section 09 9324: 'Interior Clear-Finished Hardwood'.

**1.2 REFERENCES**

- A. Association Publications:
1. Architectural Woodwork Institute / Architectural Woodwork Manufacturers Association of Canada / Woodwork Institute, 46179 Westlake Drive, Suite 120, Potomac Falls, VA [www.awinet.org](http://www.awinet.org).
    - a. Architectural Woodwork Standards (AWS), 2nd Edition, 2014.
- B. Definitions:
1. Grade: Unless otherwise noted, this term means Grade rules for Economy, Custom, and/or Premium Grade.
    - a. Custom Grade: Typically specified for and adequately covers most high-quality architectural woodwork, providing a well-defined degree of control over a project's quality of materials, workmanship, or installation.
  2. Plain Slicing: Most commonly used for hardwood plywood. The log is cut in half, and one half is placed onto a carriage and moved up and down past a fixed knife to produce the veneers. Veneer is sliced parallel to the pith of the log and approximately tangent to the growth rings to achieve flat-cut veneer. Each piece is generally placed in a stack and kept in order. One half log, sliced this way, is called a "flitch".
  3. Plain-Sawn: A hardwood figure developed by sawing a log lengthwise at a tangent to the annual growth rings. It appears as U-shaped or straight markings in the board's face.
  4. Running Trim: Generally combined in the term "standing and running trim" and refers to random, longer length trims delivered to the jobsite (e.g., baseboard, chair rail, crown molding).

**1.3 SUBMITTALS**

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

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

B. Informational Submittals:

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

- A. Manufacturers:
1. Approved Fabricators. See Section 06 4001 for Approved Fabricators.
- B. Performance / Design Criteria: Conform to requirements of Section 06 4001 'Common Architectural Woodwork Requirements'.
1. Glue: Waterproof and of best quality.
  2. Factory-finish to match Owner selected sample as specified in Section 09 9324.
- C. Architectural Woodwork Wood Trim:
1. Interior Hardwood For Transparent Finish:
    - a. Design Criteria:
      - 1) Solid wood shall be plain sawn Red Oak.
      - 2) Paneling shall be panel product with plain sliced Red Oak veneer.
      - 3) Finish to match Owner selected sample as specified in Section 09 9324.
    - b. Match existing Project Color Scheme:
      - 1) Control Sample provided by Owner:
        - a) Control Sample will be existing wood item from Project.
  2. Interior Wood For Opaque, Painted Finish:
    - a. Applies to ceiling trim only.
    - b. Solid wood shall be any species allowed by AWS Custom grade.

### **2.2 SOURCE QUALITY CONTROL**

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

## **PART 3 - EXECUTION Not Used**

**END OF SECTION**

**DIVISION 07: THERMAL AND MOISTURE PROTECTION**

**07 9000 JOINT PROTECTION**

07 9213 ELASTOMERIC JOINT SEALANTS

END OF TABLE OF CONTENTS

**SECTION 07 9213****ELASTOMERIC JOINT SEALANTS****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
  - 1. Furnish and install sealants not specified to be furnished and installed under other Sections.
  - 2. Quality of sealants to be used on Project not specified elsewhere, including submittal, material, and installation requirements.
  
- B. Related Requirements:
  - 1. Removing existing sealants specified in Sections where work required.
  - 2. Furnishing and installing of sealants is specified in Sections specifying work to receive new sealants.

**1.2 REFERENCES**

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

- b. Federal Specifications:
    - 1) Type:
      - a) Type I: Self-leveling, pour grade.
        - (1) Compound which has sufficient flow to give smooth level surface when applied in horizontal joint at 40 deg F (4.4 deg C).
      - b) Type II: Non-sag, gun grade
        - (1) Compound which permits application in joints on vertical surfaces without sagging (slumping) at temperatures 40 deg F (4.4 deg C) and 122 deg. F (50 deg. C).
      - c) Type NS: Non-sag, gun grade.
        - (1) Non-sag shall be a compound which permits application in joints on vertical surfaces without sagging (slumping) at temperatures between -20 deg F and 122 deg. F (- 29 and 50 deg. C).
    - 2) Class:
      - a) Class A: Compounds resistant to 50 percent total joint movement (includes Type I and Type II).
        - (1) Capable of resisting compression-extension cycling of plus and minus 25 percent of nominal half inch width.
      - b) Class B: Compounds resistant to 25 percent total joint movement (includes Type I and Type II).
        - (1) Capable of resisting compression-extension cycling of plus and minus 12 1/2 percent of nominal half inch width.
  - 2. Silicone: Any member of family of polymeric products whose molecular backbone is made up of alternating silicon and oxygen atoms and which has pendant hydrocarbon groups attached to silicon atoms. Used primarily as a sealant. Offers excellent resistance to water and large variations in temperature (minus 100 deg F to + 600 deg F) (minus 73.3 deg C to + 316 deg C).
- B. Reference Standards:
- 1. American Association of State and Highway Transportation Officials:
    - a. AASHTO T 132-87(2013), 'Standard Method of Test for Tensile Strength of Hydraulic Cement Mortars'.
  - 2. ASTM International:
    - a. ASTM C639-15, 'Standard Test Method for Rheological (Flow) Properties of Elastomeric Sealants'.
    - b. ASTM C661-15, 'Standard Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer'.
    - c. ASTM C679-15, 'Standard Test Method for Tack-Free Time of Elastomeric Sealants'.
    - d. ASTM C719-14, 'Standard Test Method for Adhesion and Cohesion of Elastomeric Joint Sealants Under Cyclic Movement (Hockman Cycle)'.
    - e. ASTM C793-05(2010), 'Standard Test Method for Effects of Laboratory Accelerated Weathering on Elastomeric Joint Sealants'.
    - f. ASTM C794-15a, 'Standard Test Method for Adhesion-in-Peel of Elastomeric Joint Sealants'.
    - g. ASTM C920-14a, 'Standard Specification for Elastomeric Joint Sealants'.
    - h. ASTM C1135-15, 'Standard Test Method for Determining Tensile Adhesion Properties of Structural Sealants'.
    - i. ASTM C1184-14, 'Standard Specification for Structural Silicone Sealants'.
    - j. ASTM C1193-16, 'Standard Guide for Use of Joint Sealants'.
    - k. ASTM C1248-08(2012), 'Standard Test Method for Staining of Porous Substrate by Joint Sealants'.
    - l. ASTM C1330-02(2013), 'Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid Applied Sealants'.
    - m. ASTM C1481-12 'Standard Guide for Use of Joint Sealants with Exterior Insulation & Finish Systems (EIFS)'.
    - n. ASTM D412-15a, 'Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension'.
    - o. ASTM D2202-00(2014), 'Standard Test Method for Slump of Sealants'.
    - p. ASTM D2240-15, 'Standard Test Method for Rubber Property-Durometer Hardness'.
    - q. ASTM D5893-10, 'Standard Specification for Cold Applied, Single Component, Chemically Curing Silicone Joint Sealant for Portland Cement Concrete Pavements'.



- r. ASTM E119-16a, 'Standard Test Methods for Fire Tests of Building Construction and Materials'.
- 3. Federal Specifications:
  - a. Federal Specification TT-S-001543A (CON-NBS), 'Sealing Compound: Silicone Rubber Base (for Calking, Sealing & Glazing in Buildings and Other Structures)' (9 Jun 1971).
  - b. TT-S-00230C (CON-NBS), 'Sealing compound: Elastomeric Type, Single Component (For Calking, Sealing, And Glazing In Buildings And Other Structures.' (2 Feb 1970).
- 4. Government Services Administration (GSA), Commercial Item Descriptions (CID):
  - a. GSA CID A-A-272A, 'Sealing Compound: Silicone Rubber Base (For Caulking, Sealing, and Glazing in Buildings and Other Structures)'.
  - b. GSA CID A-A-1556, 'Sealing Compound Elastomeric Type, Single Component (For Caulking, Sealing, and Glazing in Buildings and Other Structures)'.

### 1.3 ADMINISTRATIVE REQUIREMENTS

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

### 1.4 SUBMITTALS

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

### 1.5 QUALITY ASSURANCE

- A. Qualifications:
  - 1. Manufacturer: Company specializing in manufacturing products specified in this section with minimum ten (10) years documented experience.
  - 2. Applicator Qualifications:
    - a. Company specializing in performing work of this section.
    - b. Provide if requested, reference of projects with minimum three (3) years documented experience, minimum three (3) successfully completed projects of similar scope and complexity, and approved by manufacturer.
    - c. Designate one (1) individual as project foreman who shall be on site at all times during installation.
- B. Preconstruction Testing:

1. Pre-construction testing is not required when sealant manufacturer can furnish data acceptable to Architect based on previous testing for materials matching those of the Work.
- C. Mockups:
1. Provide mockups including sealant and joint accessories to illustrate installation quality and color if requested by Architect or Project Manager.
    - a. Incorporate accepted mockup as part of Work.

## 1.6 DELIVERY, STORAGE, AND HANDLING

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

## 1.7 FIELD CONDITIONS

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

## 1.8 WARRANTY

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

## PART 2 - PRODUCTS

### 2.1 SYSTEMS

- A. Manufacturers:
1. Manufacturer Contact List:
    - a. Dow Corning Corp., Midland, MI [www.dowcorning.com](http://www.dowcorning.com).
    - b. Franklin International, Inc. Columbus, OH [www.titebond.com](http://www.titebond.com).
    - c. GE Sealants & Adhesives (see Momentive Performance Materials Inc.).
    - d. Laticrete International Inc., Bethany, CT [www.laticrete.com](http://www.laticrete.com).
    - e. Momentive Performance Materials Inc. (formally GE Sealants & Adhesives), Huntersville, NC [www.ge.com/silicones](http://www.ge.com/silicones).
    - f. Sherwin-Williams, Cleveland, OH [www.sherwin-williams.com](http://www.sherwin-williams.com).
    - g. Sika Corporation, Lyndhurst, NJ [www.sikaconstruction.com](http://www.sikaconstruction.com) or Sika Canada Inc, Pointe Claire, QC [www.sika.ca](http://www.sika.ca).

- h. Tremco, Beachwood, OH [www.tremcosealants.com](http://www.tremcosealants.com) or Tremco Ltd, Toronto, ON (800) 363-3213.

B. Materials:

1. Design Criteria:

- a. Compliance: Meet or exceed requirements of these standards:
- 1) ASTM C920: Elastomeric joint sealant performance standard.
  - 2) ASTM C639 or ASTM D2202: Flow (sag or slump).
  - 3) ASTM C661 or ASTM D2240: Durometer hardness (shore A).
  - 4) ASTM C679 or ASTM C794: Tack free time (peel strength).
  - 5) ASTM C719: Joint movement capability.
  - 6) ASTM C793: Effects of accelerated weathering.
  - 7) ASTM C1135 or ASTM D412: Tensile adhesion strength.
  - 8) ASTM C1184: Structural silicone sealants.
  - 9) ASTM C1248: Staining.
  - 10) ASTM D412: Modulus.
  - 11) ASTM D5893: Silicone Joint Sealant for Concrete Pavements.
  - 12) Federal Specification TT-S-001543A.
  - 13) Federal Specification TT-S-00230C.
  - 14) GSA CID A-A-272A.
  - 15) GSA CID A-A-1556.
- b. Comply with Manufacturer's ambient condition requirements.
- c. Sealants must meet Manufacturer's shelf-life requirements.
- d. Sealants must adhere to and be compatible with specified substrates.
- e. Sealants shall be stable when exposed to UV, joint movements, and particular environment prevailing at project location.
- f. Primers (Concrete, stone, masonry, and other nonporous surfaces typically do not require a primer. Aluminum and other nonporous surfaces except glass require use of a primer. Installer Option to use Adhesion Test to determine if primer is required or use primer called out in related sections):
- 1) Adhesion Test:
    - a) Apply silicone sealant to small area and perform adhesion test to determine if primer is required to achieve adequate adhesion. If necessary, apply primer at rate and in accordance with Manufacturer's instructions. See 'Field Quality Control' in Part 3 of this specification for Adhesive Test.
    - 2) If Primer required, shall not stain and shall be compatible with substrates.
    - 3) Allow primer to dry before applying sealant.

2. Sealants At Exterior Building Elements:

- a. Description:
- 1) Weathersealing expansion, contraction, perimeter, and other movement joints which may include all or part of the following for project:
    - a) Aluminum storefront window.
- b. Design Criteria:
- 1) Meet following standards for Sealant:
    - a) ASTM C920: Type S, Grade NS, Class 50 Use NT, M, G, A.
  - 2) Limitations:
    - a) Do not use below-grade applications.
    - b) Do not use on surfaces that are continuously immersed or in contact with water.
    - c) Do not use on wet, damp, frozen or contaminated surfaces.
    - d) Do not use on building materials that bleed oils, plasticizers or solvents, green or partially vulcanized rubber gaskets or tapes.
  - 3) Color:
    - a) Architect to select from Manufacturer's standard colors.
    - b) Match building elements instead of window (do not use white that shows dirt easily).
- c. Category Four Approved Products. See Section 01 6200 for definitions of Categories:
- 1) Dow Corning:
    - a) Primer: 1200 Prime Coat.
    - b) Sealant: 791 Silicone Weatherproofing Sealant.
  - 2) Momentive Performance Materials (formerly, GE Sealants & Adhesives):

- a) Primer: SS4044 Primer.
    - b) Sealant: GE SCS2000 SilPruf Silicone Sealant & Adhesive.
  - 3) Tremco:
    - a) Primer:
      - (1) Metal surface: No. 20 primer.
      - (2) Porous surfaces: No. 23 primer.
    - b) Sealant: Spectrum 1 Silicone Sealant.
- 3. Sealants At Exterior Sheet Metal And Miscellaneous:
  - a. Description:
    - 1) Weathersealing expansion, contraction, perimeter, and other movement joints which may include all or part of the following for project:
      - a) Flashings.
      - b) Gutters.
      - c) Penetrations in soffits and fascias.
      - d) Roof vents and flues.
      - e) Lightning protection components.
  - b. Design Criteria:
    - 1) Meet following standards for Sealant:
      - a) ASTM C920: Type S Grade NS, Class 25 (min) Use NT, M, G, A and O.
    - 2) Limitations:
      - a) Do not use below-grade applications.
      - b) Do not use on surfaces that are continuously immersed or in contact with water.
      - c) Do not use on wet, damp, frozen or contaminated surfaces.
      - d) Do not use on building materials that bleed oils, plasticizers or solvents, green or partially vulcanized rubber gaskets or tapes.
  - c. Category Four Approved Products. See Section 01 6200 for definitions of Categories:
    - 1) Dow Corning: 790 Silicone Building Sealant.
    - 2) Momentive Performance Materials (formerly, GE Sealants & Adhesives): GE SCS2350 Silicone Elastomeric Sealant.
    - 3) Tremco: Tremsil 600 Silicone Sealant.
- 4. General Interior Sealants:
  - a. General:
    - 1) Inside perimeters of windows.
    - 2) Miscellaneous gaps between substrates.
  - b. Design Criteria:
    - 1) Meet ASTM C920, Type S, Grade NS, NT, and Class 25 test requirements.
    - 2) 100 percent silicone sealant.
  - c. Non-Paintable Sealant (Installer Option A):
    - 1) Category Four Approved Product. See Section 01 6200 for definitions of Categories:
      - a) Dow Corning: Tub, Tile, And Silicone Sealant.
      - b) Laticrete: Latasil Silicone Sealant.
      - c) Momentive Performance Materials (formerly, GE Sealants & Adhesives): GE SCS2800 SilGlaze II Silicone Sealant.
      - d) Sherwin Williams: White Lightning Silicone Ultra Low Odor Window and Door Sealant.
      - e) Tremco: Tremsil 200 Silicone Sealant.
      - f) Franklin International: Titebond 2601 (White) 2611 (Clear) 100% Silicone Sealant.
  - d. Paintable Sealant (Installer Option B):
    - 1) Category Four Approved Product. See Section 01 6200 for definitions of Categories:
      - a) Momentive Performance Materials (formerly, GE Sealants & Adhesives): GE SCS7000 Paintable Silicone Sealant.

## 2.2 ACCESSORIES

### A. Bond Breaker Tape:

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

- B. Joint Backing:
  - 1. Comply with ASTM C1330.
  - 2. Flexible closed cell, non-gassing polyurethane or polyolefin rod or bond breaker tape as recommended by Sealant Manufacturer for joints being sealed.
  - 3. Oversized 25 to 50 percent larger than joint width.
- C. Joint Cleaner:
  - 1. Non-corrosive and non-staining type as recommended by Sealant Manufacturer, compatible with joint forming materials.
- D. Masking Tape:
  - 1. Non-staining, non-absorbent tape product compatible with joint sealants and adjacent joint surfaces.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

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

### **3.2 PREPARATION**

- A. Surface Preparation:
  - 1. Remove existing joint sealant materials where specified.
    - a. Clean joint surfaces of residual sealant and other contaminates capable of affecting sealant bond to joint surface using manufacturer's recommended joint preparation methods.
    - b. Repair deteriorated or damaged substrates as recommended by Sealant Manufacturer to provide suitable substrate. Allow patching materials to cure.
  - 2. Surfaces shall be clean, dry, free of dust, oil, grease, dew, frost or incompatible sealers, paints or coatings that may interfere with adhesion. Prepare substrates in accordance with Manufacturer's instructions:
    - a. Porous surfaces: Clean by mechanical methods to expose sound surface free of contamination and laitance followed by blasting with oil-free compressed air.
    - b. Nonporous surfaces: Use two-cloth solvent wipe in accordance with ASTM C1193. Allow solvent to evaporate prior to sealant application.
    - c. High-pressure water cleaning: Exercise care that water does not enter through failed joints.
    - d. Primers:
      - 1) Primers enhance adhesion ability.
      - 2) Use of primers is not a substitution for poor joint preparation.
      - 3) Primers should be used always in horizontal application where there is ponding water.
  - 3. Field test joints in inconspicuous location.
    - a. Verify joint preparation and primer required to obtain optimum adhesion of sealants to joint substrate.
    - b. When test indicates sealant adhesion failure, modify joint preparation primer, or both and retest until joint passes sealant adhesion test.
  - 4. Masking: Apply masking tape as required to protect adjacent surfaces and to ensure straight bead line and facilitate cleaning.

- B. Joints:
  - 1. Prepare joints in accordance with ASTM C1193.
    - a. Clean joint surfaces of contaminants capable of affecting sealant bond to joint surface using Manufacturer's recommended instructions for joint preparation methods.
    - b. Remove dirt, dust, oils, wax, paints, and contamination capable of affecting primer and sealant bond.
    - c. Clean concrete joint surfaces to remove curing agents and form release agents.
- C. Protection:
  - 1. Protect elements surrounding the Work of this section from damage or disfiguration.

### 3.3 APPLICATION

- A. General:
  - 1. Apply silicone sealant in accordance with Manufacturer's instructions.
  - 2. Do not use damaged or deteriorated materials.
  - 3. Install primer and sealants in accordance with ASTM C1193 and Manufacturer's instructions.
  - 4. Apply primer where required for sealant adhesion.
  - 5. Install sealants immediately after joint preparation.
  - 6. Do not use silicone sealant as per the following:
    - a. Apply caulking/sealant at temperatures below 40 deg F (4 deg C).
    - b. Below-grade applications.
    - c. Brass and copper surfaces.
    - d. Materials bleeding oils, plasticizers, and solvents.
    - e. Structural glazing and adhesive.
    - f. Surfaces to be immersed in water for prolonged time.
- B. Joint Backing:
  - 1. Install joint backing to maintain sealant joint ratios recommended by Manufacturer.
  - 2. Install without gaps, twisting, stretching, or puncturing backing material. Use gage to ensure uniform depth to achieve correct profile, coverage, and performance.
  - 3. Rod for open joints shall be at least 1-1/2 times width of open joint and of thickness to give solid backing. Backing shall fill up joint so depth of sealant bite is no more than 3/8 inch (9.5 mm) deep.
- C. Bond Breaker:
  - 1. Install bond breaker where joint backing is not used or where backing is not feasible.
    - a. Apply bond-breaker tape in shallow joints as recommended by Sealant Manufacturer.
- D. Sealant:
  - 1. Apply sealant with hand-caulking gun with nozzle of proper size to fit joints. Use sufficient pressure to insure full contact to both sides of joint to full depth of joint. Apply sealants in vertical joints from bottom to top.
  - 2. Fill joint opening to full and proper configuration.
  - 3. Apply in continuous operation.
  - 4. Tool joints immediately after application of sealant if required to achieve full bedding to substrate or to achieve smooth sealant surface. Tool joints in opposite direction from application direction, i.e., in vertical joints, from the top down. Do not 'wet tool' sealants.
  - 5. Depth of sealant bite shall be 1/4 inch (6 mm) minimum and 1/2 inch (12.7 mm) maximum, but never more than one half or less than one fourth joint width.
- E. Caulk gaps between painted or coated substrates and unfinished or pre-finished substrates. Caulk gaps larger than 3/16 inch (5 mm) between painted or coated substrates.

### 3.4 TOLERANCES

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

### 3.5 FIELD QUALITY CONTROL

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

### 3.6 CLEANING

- A. Remove masking tape and excess sealant.
- B. Clean adjacent materials, which have been soiled, immediately (before setting) as recommended by Manufacturer.
- C. Waste Management: Dispose of products in accordance with manufacturer's recommendation.

**END OF SECTION**

## **DIVISION 08: OPENINGS**

### **08 4000 ENTRANCES, STOREFRONTS, AND CURTAIN WALLS**

08 4113 ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

END OF TABLE OF CONTENTS



**SECTION 08 4113****ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
  - 1. Furnish and install aluminum storefront entry and window systems including, plastic glazing, and caulking, as described in Contract Documents and including the following:
    - a. Remove existing storefront door and replace with frames and plastic glazing.
- B. Related Requirements:
  - 1. Section 01 1100: 'Summary Of Work' for cores for High Security Cylinders are excluded from Contract and provided by Owner. This specification establishes quality of materials and installation of those items for information of Contractor, Architect, and Owner's Representatives.
  - 2. Section 07 9213: 'Elastomeric Joint Sealant' for quality of sealants.

**1.2 REFERENCES**

- A. Association Publications:
  - 1. American Architectural Manufacturers Association (AAMA):
    - a. AAMA SFM 1-14, 'Aluminum Store Front and Entrance Manual'.
    - b. AAMA 501-15, 'Methods of Test for Exterior Walls'.
    - c. AAMA 609 & 610-15, 'Cleaning and Maintenance Guide for Architecturally Finished Aluminum' (combined documents).
    - d. AAMA 611-14, 'Voluntary Standards for Anodized Architectural Aluminum'.
    - e. AAMA 2605-13, 'Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels'.
- B. Reference Standards:
  - 1. ASTM International:
    - a. ASTM B221-14, 'Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes'.
    - b. ASTM B456-11, 'Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium'.
    - c. ASTM B633-15, 'Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel'.
    - d. ASTM C920-14a, 'Standard Specification for Elastomeric Joint Sealants'.
    - e. ASTM C1184-14, 'Standard Specification for Structural Silicone Sealants'.
    - f. ASTM E283-04(2012), 'Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen'.
    - g. ASTM E330/E330M-14, 'Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference'.
    - h. ASTM E331-00(2009), 'Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference'.
    - i. ASTM E1996-14a, 'Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Windborne Debris in Hurricanes'.
  - 2. International Building Code (IBC):
    - a. Chapter 10, 'Means of Egress'.
    - b. Chapter 16, 'Structural Design'.
      - 1) Section 1609 'Wind Loads'.
  - 3. International Code Council / American National Standards Institute:
    - a. ICC / ANSI A117.1-2009, 'Accessible and Usable Buildings and Facilities'.

4. National Fenestration Rating Council (NFRC):
  - a. NFRC 100-2014, 'Procedure for Determining Fenestration Product U-factors'.
5. National Fire Protection Association / American National Standards Institute:
  - a. NFPA 101-2015, 'Life Safety Code'.

### 1.3 ADMINISTRATIVE REQUIREMENTS

- A. Pre-Installation Conference:
  1. Participate in pre-installation conference as specified in Section 06 1100.
    - a. Schedule pre-installation conference one (1) week before scheduled installation of storefront system.
    - b. In addition to requirements of Section 01 3100, review following:
      - 1) Review rough opening requirements:
        - a) Existing Building:
          - (1) Field verify rough openings before fabrication of storefront entrances.
      - 2) Review installation scheduling, coordination, placement of doors.
      - 3) Review low-energy door operator location and requirements.
      - 4) Review delivery, storage, and handling requirements.
      - 5) Review 'Examination' requirements before sliding door installation.
      - 6) Review 'Finish' door and hardware requirements.
      - 7) Review 'Protection' responsibilities.
      - 8) Review 'Cleaning' responsibilities.
      - 9) Review safety issues.

### 1.4 SUBMITTALS

- A. Action Submittals:
  1. Product Data:
    - a. Manufacturer's literature.
      - 1) Storefront entry system.
      - 2) Low-energy door operator.
    - b. Color and finish.
  2. Shop Drawings:
    - a. Clearly mark components to identify their location in Project.
    - b. Show locations, sizes, etc, of hardware reinforcing.
- B. Informational Submittals:
  1. Qualification Statement:
    - a. Installer:
      - 1) Provide Qualification documentation if requested by Architect or Owner.
- C. Closeout Submittals:
  1. Include following in Operations And Maintenance Manual specified in Section 01 7800:
    - a. Operations and Maintenance Data:
      - 1) Maintenance, adjustment, and repair instructions.
    - b. Warranty Documentation:
      - 1) Final, executed copy of Warranty.
        - a) Storefront warranty.
        - b) Storefront closers.
        - c) Low-energy door operator.
    - c. Record Documentation:
      - 1) Manufacturers documentation:
        - a) Manufacturer's literature or cut sheets for storefront system and for each item of hardware.
        - b) Manufacturer's literature of cut sheets for low-energy door operators.
        - c) Color and finish selections.
        - d) Parts lists.

## 1.5 QUALITY ASSURANCE

- A. Regulatory Agency Sustainability Approvals:
1. Storefront System Performance Requirements:
    - a. Provide test reports from AAMA accredited laboratories certifying performances if requested:
      - 1) Air Leakage: Meet requirements of ASTM E283.
      - 2) Limit air leakage through assembly to 0.06 CFM/min/sq ft (.00003 m<sup>3</sup>/sm<sup>2</sup>) of wall area at 6.24 PSF (300 Pa) as measured in accordance with ASTM E283.
      - 3) Water Resistance: No water leakage when measured in accordance with ASTM E331 with static test pressure of 8PSF (384 Pa) as defined by AAMA 501.
      - 4) Dynamic Water Resistance: No water leakage, when measured in accordance with AAMA 501 with dynamic test pressure of 8 PSF (384 Pa).
      - 5) Limit mullion wind load deflection of L/175 with full recovery of glazing materials, when measured in accordance with ASTM E330/E330M.
      - 6) System shall not deflect more than 1/8 inch (3 mm) at center point, or 1/16 inch (1.58 mm) at enter point of horizontal member, once dead load points have been established.
      - 7) System shall accommodate expansion and contraction movement due to surface temperature differential of 180 deg F (82 deg C).
      - 8) Seismic testing shall conform to AAMA recommended static test method for evaluating performance of curtain walls and storefront wall systems due to horizontal displacements associated with seismic movements and building sway.
    2. Provide wind load and impact testing by testing laboratory when required by local codes and jurisdictions:
      - 1) Wind Driven Rain.
        - a) Miami-Dade Protocol: Product Approval:
          - (1) PA 201, 'Large Missile Impact Test'.
          - (2) PA 202, 'Structural Pressure, Air, Water, and Forced Entry Testing'.
          - (3) PA 203, 'Cyclic Wind Pressure Loading'.
- B. Qualifications: Requirements of Section 01 4301 applies, but not limited to following:
1. Manufacturer Qualifications:
    - a. Provide aluminum entrances and storefront systems produced by firm experienced in manufacturing systems that are similar to those indicated for this project and have record of successful in service performance.
  2. Fabricator Qualifications:
    - a. Provide aluminum entrances and storefront systems fabricated by a firm experienced in producing systems that are similar to those indicated for this Project, and have record of successful in service performance.
    - b. Fabricator shall have sufficient production capacity to produce components required without causing delay in progress of the Work.
  3. Installer Qualifications:
    - a. Minimum three (3) years experience in storefront installations.
    - b. Minimum five (5) satisfactorily completed projects of comparable quality, similar size, and complexity in past three (3) years before bidding.
    - c. Upon request, submit documentation.

## 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Delivery And Acceptance Requirements:
1. Deliver all parts of door, together with hardware, in original, unopened packages with labels intact to Project at same time.
- B. Storage And Handling Requirements:
1. Store in clean, dry location, indoors in Manufacturer's unopened packaging until ready for installation and in accordance with Manufacturer's instructions.
  2. Stack framing components in a manner that will prevent bending and avoid significant or permanent damage.
  3. Protect materials and finish from damage during storage, handling and installation.

**PART 2 - PRODUCTS****2.1 ASSEMBLIES**

- A. Manufacturers:
1. Category One VMR Approved Manufacturers. See Section 01 6200 for definitions of Categories:
    - a. Kawneer North America, Norcross, GA, [www.kawneer.com/kawneer/north\\_america](http://www.kawneer.com/kawneer/north_america).
      - 1) Contact Information: Bart Daniels cell (385) 214-4650 [bart.daniels@alcoa.com](mailto:bart.daniels@alcoa.com).
- B. General:
1. In addition to requirements shown or specified, comply with:
    - a. Applicable provisions of AAMA SFM 1, 'Aluminum Store Front and Entrance Manual' for design, materials, fabrication and installation of component parts.
- C. Design Criteria:
1. Storefront System suitable for outside or inside plastic glazing.
- D. Materials:
1. Framing Components and Accessories:
    - a. Aluminum Extrusions:
      - 1) 6063-T6 aluminum alloy or meet requirements of ASTM B221, alloy GS 10a T6.
      - 2) Anchors, Clips, and Accessories:
        - a) Aluminum, nonmagnetic stainless steel, or zinc-coated steel or iron complying with ASTM B633 for SC 3 severe service conditions or other suitable zinc coating; provide sufficient strength to withstand design pressure indicated (properly isolated steel from aluminum).
      - 3) Fasteners:
        - a) Aluminum, nonmagnetic stainless steel or other materials to be non-corrosive and compatible with aluminum window members, trim hardware, anchors, and other components.
      - 4) Glazing Gasket:
        - a) Compression-type design with replaceable extruded EPDM rubber.
      - 5) Reinforcing Members:
        - a) Aluminum, nonmagnetic stainless steel, or nickel/chrome-plated steel complying with ASTM B456 for Type SC 3 severe service conditions, or zinc-coated steel or iron complying with ASTM B633 for SC 3 severe service conditions or other suitable zinc coating; provide sufficient strength to withstand design pressure indicated.
      - 6) Sealant:
        - a) Structural Sealant meeting requirements of ASTM C1184 for fabrication within storefront system:
          - (1) Permanently elastic, non-shrinking, and non-migrating type for joint size and movement.
          - (2) Single-component neutral-curing silicone formulation compatible with system components specifically formulated and tested for use as structural sealant and approved by structural-sealant manufacturer for use in aluminum-framed systems indicated.
          - (3) Color: Black.
        - b) Joint Sealants used at perimeter of storefront framing system: Elastomeric Sealant as specified in Section 07 9213.
        - c) Provide sealants for use inside of the weatherproofing system that have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
      - 7) Tolerances:
        - a) Tolerances for wall thickness and other cross-sectional dimensions of storefront members in compliance with AA Aluminum Standards and Data.
    - b. Storefront Framing System:
      - 1) Brackets and Reinforcements:

- a) Manufacturer's standard high-strength aluminum with non-staining, nonferrous shims for aligning system components.
  - 2) Fasteners and Accessories:
    - a) Manufacturer's standard corrosion-resistant, non-staining, non-bleeding fasteners and accessories compatible with adjacent materials.
  - 3) Perimeter Anchors:
    - a) When steel anchors are used, provide insulation between steel material and aluminum material to prevent galvanic action.
  - c. Finish:
    - 1) Match existing bronze frames.
  - d. Category Four Approved Products. See Section 01 6200 for definitions of Categories:
    - 1) Non-Thermal, 2 inch (50 mm) Sightline:
      - a) Double Stack header at exterior doors only if shown on Contract Drawings.
      - b) Single Glazed:
        - (1) AR450 by Arcadia.
        - (2) Trifab VG 450 by Kawneer.
2. Storefront windows:
- a. Aluminum:
    - 1) 6063-T6 aluminum alloy or meet requirements of ASTM B221, alloy GS 10a T6.
  - b. Bottom Rails:
    - 1) 10 inches minimum by 1-3/4 inches by 0.125 inches (254 mm minimum by 45 mm by 3.175 mm) thick nominal.
  - c. Construction:
    - 1) Manufacturer's standard.
  - d. Glazing Stops:
    - 1) Snap-in type with neoprene bulb-type glazing. Units shall be glazed from exterior side.
  - e. Weatherstripping:
    - 1) Neoprene bulb-type.
    - 2) Category Four Approved Products. See Section 01 6200 for definitions of Categories:
      - a) Peri-Plus Seal (PPS) by Arcadia.
      - b) Sealair by Kawneer.
  - f. Framing System Gaskets and Sealants:
    - 1) Manufacturer's standard, recommended by manufacturer for joint type:
    - 2) Sealants: As specified in Framing Components and Accessories.
  - g. Factory Finishing:
    - 1) Dark Bronze Finish (match existing):
      - a) Class I Color Anodic Finish: AA-M12C22A42/44 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; integrally colored or electrolytically deposited color coating 0.70 mils (0.01778 mm) or thicker), complying with AAMA 611.
  - h. Category Four Approved Products. See Section 01 6200 for definitions of Categories:
    - 1) Non-Thermal:
      - a) MS362 Medium Stile by Arcadia.
      - b) 350 Medium Stile by Kawneer.
3. Glazing:
- a. Plastic Glazing:
    - 1) 1/4 inch (6 mm) thick pebbled plexiglass to match existing plastic glazing.
    - 2) Color as selected by Architect.
    - 3) Acceptable Manufacturer: Altuglas International, Philadelphia, PA [www.plexiglas.com](http://www.plexiglas.com)
    - 4) Equal as approved by Architect prior to installation.
  - b. Glazing Gaskets:
    - 1) Compression-type design with replaceable extruded EPDM rubber.
  - c. Spacers and Setting Blocks: Elastomeric.
  - d. Bond-Breaker (Sealer) Tape: Standard TFE-fluorocarbon or polyethylene material to which sealants will not develop adhesion.
  - e. Glazing Sealant:
    - 1) Structural Sealant meeting requirements of ASTM C1184:
      - a) Permanently elastic, non-shrinking, and non-migrating type for joint size and movement.

- b) Single-component neutral-curing silicone formulation compatible with system components specifically formulated and tested for use as structural sealant and approved by structural-sealant manufacturer for use in aluminum-framed systems indicated.
  - c) Color: Black.
  - 2) Weather Sealant:
    - a) ASTM C920 for Type S, Grade NS, Class 25, Uses NT, G, A, and O; single-component neutral-curing formulation that is compatible with structural sealant and other system components with which it comes in contact; recommended by structural-sealant, weather seal sealant, and aluminum-framed-system manufacturers for this use.
    - b) Color: Match structural sealant.
  - 3) Provide sealants for use inside of the weatherproofing system that have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- E. Fabrication:
- 1. Construction shall meet Manufacturer's recommendations.
  - 2. Fabricate components that, when assembled, have following characteristics:
    - a. Profiles sharp, straight, and free of defects or deformations.
    - b. Accurately fit joints; make joints flush, hairline and weatherproof.
    - c. Means to drain water passing joints, condensation within framing members, and moisture migrating within system to exterior.
    - d. Physical and thermal isolation of glazing from framing members.
    - e. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
    - f. Provisions for field replacement of glazing.
    - g. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.
    - h. Framing members shall be internally reinforced and secured at head and sill as necessary for structural performance requirements and for hardware attachment.
  - 3. Fabricate in factory to dimensions required to fit framed openings detailed on Contract Documents. Joints shall be tightly closed.
  - 4. Mortise in manner to give maximum hardware-door connection strength and neatness of appearance. Adequately reinforce with back plates or rivnuts to hold pivots and closers.
  - 5. Mechanically Glazed Framing Members: Fabricate for flush glazing without projecting stops.
  - 6. Structural-Sealant-Glazed Framing Members: Include accommodations for using temporary support device to retain glazing in place while structural sealant cures.
  - 7. Storefront Framing: Fabricate components for assembly using manufactures standard installation instructions.
  - 8. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

## **PART 3 - EXECUTION**

### **3.1 INSTALLERS**

- A. Performance Standard Installers: See Section 01 6200 for definitions of Categories. See Section 01 4301 and 'Quality Assurance' in Part 1 'General' for Installer Qualifications of this specification:
  - 1. General Contractor responsible for Installer(s), verification of qualifications, and performance. Contact VMR Approved Manufacturer's Representative specified in Part 2 'Products' of this specification for potential installers if desired.

### **3.2 EXAMINATION**

- A. Verification Of Conditions:

1. Verify that framed openings comply with Contract Document requirements.
2. Verify floor is level across entire width of automatic door opening.
3. Verify sill conditions are level and/or sloped away from openings as specified.
4. Verify wall framing is dry, clean, sound, and free of voids and offsets, construction debris, sharp edges or anything that will prevent a successful installation of storefront system.
5. Notify Architect and Owner in writing if framed openings are not as agreed upon.
  - a. Do not install storefront entry and window frames until deficiencies in framed openings have been corrected to allow installation of standard entries and windows.
  - b. Commencement of Work by installer is considered acceptance of substrate.

### 3.3 INSTALLATION

#### A. General:

1. Installation shall meet or exceed all applicable federal, state and local requirements, referenced standards and conform to codes and ordinances of authorities having jurisdiction.
2. All installation shall be in accordance with manufacturer's published recommendations and in accordance with approved shop drawings.
3. Do not install damaged components. Fit frame joints tight, free of burrs and distortion. Rigidly secure non-movement joints.
4. Isolate metal surfaces in contact with incompatible metal or corrosive substrates, including wood, by applying sealer tape to prevent electrolytic action.

#### B. Set plumb, square, level, and in correct alignment and securely anchor to following tolerances:

1. Variation from plane: Limit to 1/8 inch (3 mm) in 12 feet (3.6 meters); 1/4 inch (6 mm) over total length.
2. Offset from Alignment: For surfaces abutting in line, limit offset to 1/16 inch (1.6 mm).
3. Offset at Corners: For surfaces meeting at corner, limit offset to 1/32 inch (0.8 mm).
4. Diagonal measurements: Limit difference between diagonal measurements to 1/8 inch (3 mm).

#### C. Install doors without warp or rack. Adjust doors and hardware to provide 90 degree operation, tight fit at contact points and smooth operation.

#### D. Install exterior window units with through wall sill flashing.

#### E. Sealants:

1. Apply in accordance with Section 07 9213 'Elastomeric Joint Sealant' requirements.
2. Caulk joints between frames and walls, both interior and exterior to provide weather tight installation.

### 3.4 FIELD QUALITY CONTROL

#### A. Field Tests And Inspections:

#### 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 including removal and replacement of glazing that has been broken, chipped, cracked, abraded, or damaged during construction period at no additional cost to the Owner.

### 3.5 ADJUSTING

- #### A. Adjust swing doors for proper operation after glazing entry. After repeated operation of completed installation, re-adjust door for optimum operating condition and safety if required.

### 3.6 PROTECTION

- A. During Installation:
  - 1. Installer's Responsibility:
    - a. During installation, all adjacent work shall be protected from damage.
- B. After Installation:
  - 1. General Contractor's Responsibility:
    - a. Institute protective measures required throughout remainder of construction period to ensure that aluminum entrances and storefronts will be without damage or deterioration, other than normal weathering, at time of acceptance.

### 3.7 CLEANING

- A. General:
  - 1. Installer's Responsibility:
    - a. Follow Manufacturer's written recommendations for cleaning and maintenance or guidelines of AAMA 609 & 610 'Cleaning and Maintenance Guide for Architecturally Finished Aluminum' (combined documents). Avoid damaging protective coatings and finishes.
    - b. Clean glazing and aluminum surfaces, inside and out, promptly after installation. Remove excess glazing and sealant compounds, dirt, and other substances. Exercise care to avoid damage to coatings.
    - c. Remove nonpermanent labels, protective films, and clean surfaces following recommended procedures.
      - 1) Do NOT remove permanent ANSI/AAMA/CSA or NFRC labels.
- B. Waste Management:
  - 1. Upon completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

**END OF SECTION**



## **DIVISION 09: FINISHES**

### **09 0500 COMMON WORK RESULTS FOR FINISHES**

09 0503 FLOORING SUBSTRATE PREPARATION

### **09 6000 FLOORING**

09 6816 SHEET CARPET: BACK CUSHION, DIRECT GLUE

### **09 9000 PAINTS AND COATINGS**

09 9001 COMMON PAINTING AND COATING REQUIREMENTS

09 9324 INTERIOR CLEAR-FINISHED HARDWOOD

END OF TABLE OF CONTENTS

**SECTION 09 0503****FLOORING SUBSTRATE PREPARATION****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
1. Preparing floor substrate to receive flooring as described in Contract Documents.
  2. Remove existing carpet and prepare floor as described in Contract Documents.
  3. Remove, protect, and store rostrum seating and piano. Reinstall rostrum seating and piano after carpet installation.
  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 7800: 'Closeout Submittals'.
  7. Section 03 3111: 'Cast-In-Place Structural Concrete' for installation tolerances for concrete slabs.
  8. Section 09 6816: 'Sheet Carpeting'.

**1.2 REFERENCES**

- A. Association Publications:
1. American Concrete Institute, Farmington Hills, MI [www.concrete.org](http://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](http://www.icri.org).
    - a. ICRI Certification: 'Concrete Slab Moisture Testing Technician, Tier 2, Grade 1'.
- B. Reference Standards:
1. ASTM International:
    - a. ASTM F710-11, 'Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring'.
    - b. ASTM F1869-16, 'Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride'.
    - c. ASTM F2170-16, '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.

#### **1.4 SUBMITTALS**

#### **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.

#### **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. 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 marks 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.

**END OF SECTION**

**SECTION 09 6816****SHEET CARPETING: Back Cushion, Direct Glue****PART 1 - GENERAL****1.1 SUMMARY**

- A. Section Includes But Is Not Limited To:
1. Coordination, sequencing, and scheduling installation of Owner-Furnished carpet, carpet base, carpet accessories, leveling compounds as described in Contract Documents and including following:
    - a. Pre-Installation Conference held in conjunction with Section 09 6813.
    - b. Maintain Building Ambient Conditions including normal levels of humidity, lighting, heating, and air conditioning for acceptability for beginning floor preparation and carpet installation.
    - c. Protection of carpet after installation of carpeting as required.
- 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.
  2. Section 09 0503: 'Flooring Substrate Preparation' for:
    - a. Floor substrate preparation.
    - b. Removal of furniture including rostrum seating.
    - c. Pre-installation conference for Sections under 09 6000 heading 'Flooring.'

**1.2 REFERENCES**

- A. Association Publications:
1. The Carpet and Rug Institute (CRI), Dalton, GA [www.carpet-rug.org](http://www.carpet-rug.org). Standard for Installation Specification of Commercial Carpet:
    - a. CRI Indoor Air Quality (IAQ):
      - 1) CRI Green Label Plus Certification.
- B. Reference Standards:
1. The Carpet and Rug Institute (CRI):
    - a. CRI 104, 'Standard For Installation of Commercial Carpet' (Sept 2015).
    - b. CRI TM-102, 'School Carpet Minimum Average Specifications'.

**1.3 ADMINISTRATIVE REQUIREMENTS**

- A. Coordination:
1. Coordinate completion of carpet installation with other trades.
- B. Pre-Installation Conference:
1. Participate in MANDATORY pre-installation conference as specified in Section 09 0503 and held jointly with Section 09 6813 pre-installation conference.
  2. Schedule pre-installation conference before installation of flooring system.
  3. Conference may be held at project site or another convenient site. Participants may also attend by video or audio conference if approved by Project Manager.
  4. Schedule conference after substrate preparation and ONE (1) week before installation of flooring system.
  5. In addition to agenda items specified Section 01 3100 and Section 09 0503, review following:
    - a. Review Owner's Representative schedule for furnishing and installation carpet.

- b. Review Flooring Manufacturer's installation conditions verification procedure and requirements.
  - c. Review Building Ambient Conditions including normal levels of humidity, lighting, heating, and air conditioning for acceptability for beginning floor preparation and carpet installation.
  - d. Removal of furniture including rostrum seating.
  - e. Review cleaning and disposal requirements.
  - f. Review protection requirements of carpet after installation of carpeting.
- C. Scheduling:
1. Notify Flooring Installer when Building Ambient Conditions requirements are met before installation of flooring system.
  2. 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.
- 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. Category One Approved Carpet Manufacturers:
      - 1) Approval subject to 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 65° - 95° F (18° - 35° C) with maximum relative humidity of 65%.
    - b) Substrate surface temperature should not be less than 65° F (18° C) at time of installation.
    - c) Do not allow temperature of indoor carpeted areas to fall below 50° F (10° C), regardless of age of installation.
  - 2) Maintain fresh air ventilation after installation for seventy-two (72) hours minimum or until lingering odors are gone.

#### 2. Concrete Slab:

##### a. General:

- 1) Do not install carpet over concrete slabs until slabs have cured and are sufficiently dry to bond with adhesive.

## 1.8 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 platform ('affected carpet area'). Such cure must preserve as uniform a blended appearance, acceptable to Carpet Manufacturer and Owner, as exists throughout Installation Site at time of breach.
- 2) If carpet defect or installation defect continues to appear after three (3) separate notices for correction from Owner, replace carpet where defects have occurred.
- e. If Carpet Manufacturer follows installation requirements of Section 09 0503 'Floor Substrate Preparation' Carpet Manufacture accepts liability of carpet installation for said given time as outlined in Special Warranty regardless of any climate or condition changes affecting RH levels of floor substrate.
2. Special Warranty:
  - a. Sheet Carpeting:
    - 1) General:
      - a) Appearance Retention to be provided with Special Warranty requirements if not already included in Standard Warranty.
    - 2) Meetinghouse, Mission Office, and O&M / R&I:
      - a) Owner Carpet Program Product: Provide twenty (20) year minimum or Carpet Manufacturer's better Warranty on carpet system.

## PART 2 - PRODUCTS

### 2.1 OWNER-FURNISHED PRODUCTS

- A. Category One Approved Manufacturers. See Section 01 6200 for definitions of Categories:
  1. Materials supplied for carpet installation shall be complete package from specified Carpet Manufacturer:
    - a. Lees, Division of Mohawk Carpets, Glasgow, VA:
      - 1) Contact Information: Help Line (800) 523-5555 or (801) 397-5626.
    - b. Mannington Commercial Carpets, Calhoun, GA:
      - 1) Contact Information: Help Line Voice Mail (800) 241-2262, ext 8045 or Mannington Installation Services, email lds@mannington.com or (855) 466-2664.
    - c. Tandus Centiva: Dalton, GA www.tandus-centiva.com.
      - 1) Contact Information: Tracy Riddle - cell (801) 580-5147 fax (866) 861-7522 Tracy.Riddle@Tarkett.com.
- B. Materials:
  1. Carpet:
    - a. Category One Approved Manufacturer and Color / Patterns. See Section 01 6200 for definitions of Categories: Match existing carpet.
  2. Carpet Base:
    - a. 4-1/2 inch (115 mm) wide base without cushion backing:
      - 1) Top edge of base serged with 1-1/4 inch (32 mm) polyester binding fabric.
      - 2) Roll edges of binding fabric under and sew along top edge of carpet cove base.
    - b. Carpet:
      - 1) Category One Approved Products. See Section 01 6200 for definitions of Categories: Match existing carpet.

### 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.

## **PART 3 - EXECUTION**

### **3.1 APPROVED INSTALLER**

- A. Category One Approved Installer. See Section 01 6200 for definitions of Categories:
1. Flooring Services Inc., Sandy, UT [www.flooringservices.com](http://www.flooringservices.com).
    - a. Contact Marie Davis, Account Manager, office (801) 487-3600, cell (801) 631-9152 email [marie@flooringservices.com](mailto:marie@flooringservices.com).

### **3.2 EXAMINATION**

- A. Verification of Conditions:
1. Verify required ambient conditions inside building for required normal levels of humidity, lighting, heating, and air conditioning have been maintained for at least forty-eight (48) hours before and during carpet installation and seventy-two (72) after installation of carpet.
- 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 rostrum seating, and pianos to identify condition and anchorage system of each. Make written record of existing marks 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 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. 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.
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 on Rostrum, parallel to Rostrum seating.
  - g. 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.

#### C. 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.

### 3.5 FIELD QUALITY CONTROL

#### A. Field Inspections:

##### 1. Carpeting:

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

#### B. Non-Conforming Work:

##### 1. Carpeting:

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

### 3.6 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).

### 3.7 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 9001****COMMON PAINTING AND COATING REQUIREMENTS****PART 1 - GENERAL****1.1 SUMMARY****A. Includes But Not Limited To:**

1. Common procedures and requirements for field-applied painting and coating.

**B. Related Requirements:**

1. Section 05 0503: 'Shop-Applied Metal Coatings' for quality of shop priming of steel and iron.
2. Section 07 9213: 'Elastomeric Joint Sealants' for quality of Elastomeric Joint Sealants.
3. Sections under 09 9000 heading 'Paints and Coatings'.
  - a. Pre-Installation conferences held jointly with Section 09 9001.

**1.2 REFERENCES****A. Definitions:**

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

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

3. **Properly Painted Surface:**

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

**B. Reference Standards:**

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

### 1.3 ADMINISTRATIVE REQUIREMENTS

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

### 1.4 SUBMITTALS

- A. Action Submittals:
1. Product Data:
    - a. Include following information for each painting product, arranged in same order as in Project Manual.
      - 1) Manufacturer's cut sheet for each product indicating ingredients and percentages by weight and by volume, environmental restrictions for application, and film thicknesses and spread rates.
      - 2) Provide one (1) copy of 'MPI Approved Products List' showing compliance for each MPI product specified.
        - a) MPI Information is available from MPI Approved Products List using the following link: <http://www.paintinfo.com/mpi/approved/index.shtml>.
      - 3) Confirmation of colors selected and that each area to be painted or coated has color selected for it.
  2. Samples: Provide two 4 inch by 6 inch (100 mm by 150 mm) minimum draw-down cards for each paint or coating color selected for this Project.
- B. Informational Submittals:
1. Manufacturer Instructions:
    - a. Manufacturer's substrate preparation instructions and application instruction for each painting system used on Project.
  2. Qualification Statement:
    - a. Applicator:
      - 1) Provide Qualification documentation if requested by Architect or Owner.
- C. Closeout Submittals:
1. Include following in Operations And Maintenance Manual specified in Section 01 7800:
    - a. Record Documentation:
      - 1) Manufacturer's documentation:
        - a) Manufacturer's cut sheet for each component of each system.
        - b) Schedule showing rooms and surfaces where each system was used.
- D. Maintenance Materials Submittals:
1. Extra Stock Materials:

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

## 1.5 QUALITY ASSURANCE

- A. Regulatory Agency Sustainability Approval:
  1. Conform to work place safety regulations and requirements of those authorities having jurisdiction for storage, mixing, application and disposal of all paint and related hazardous materials.
  2. Paint and painting materials shall be free of lead and mercury, and have VOC levels acceptable to local jurisdiction.
  3. Master Painters Institute (MPI) Standards:
    - a. Products: Comply with MPI standards indicated and listed in 'MPI Approved Products List'.
    - b. Preparation and Workmanship: Comply with requirements in 'MPI Architectural Painting Specification Manual' for products and coatings indicated.
- B. Qualifications:
  1. Applicator: Requirements of Section 01 4301 applies, but not limited to following:
    - a. Minimum five (5) years experience in painting installations.
    - b. Minimum five (5) satisfactorily completed projects of comparable quality, similar size, and complexity in past three (3) years before bidding.
    - c. Maintain qualified crew of painters throughout duration of the Work.
    - d. Upon request, submit documentation.
- C. Field Samples:
  1. Before application of any paint system, meet on Project site with Architect, Owner's representative, and Manufacturer's representative. Architect may select one (1) surface for application of each paint system specified. This process will include establishing acceptable substrate conditions required for Project before application of paints and coatings.
  2. Apply paint systems to surfaces indicated by Architect following procedures outlined in Contract Documents and Product Data submission specified above.
  3. After approval of samples, proceed with application of paint system throughout Project. Approved samples will serve as standard of acceptability.

## 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Delivery And Acceptance Requirements:
  1. Deliver specified products in sealed, original containers with Manufacturer's original labels intact on each container.
  2. Deliver amount of materials necessary to meet Project requirements in single shipment.
- B. Storage And Handling Requirements:
  1. Store materials in single place.
  2. Keep storage area clean and rectify any damage to area at completion of work of this Section.
  3. Maintain storage area at 55 deg F (13 deg C) minimum.

## 1.7 FIELD CONDITIONS

- A. Ambient Conditions:
  1. Perform painting operations at temperature and humidity conditions recommended by Manufacturer for each operation and for each product for both interior and exterior work.
  2. Apply painting systems at lighting level of 540 Lux (50 foot candles) minimum on surfaces to be painted.
    - a. Inspection of painting work shall take place under same lighting conditions as application.

- b. If painting and coating work is applied under temporary lighting, deficiencies discovered upon installation of permanent lighting will be considered latent damage as defined in MPI Manual, PDCA P1-92.

## **PART 2 - PRODUCTS**

### **2.1 SYSTEMS**

- A. Performance:
  1. Design Criteria:
    - a. Provide materials for use within each coating system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
    - b. All materials, preparation and workmanship shall conform to requirements of 'Architectural Painting Specification Manual' by Master Painters Institute (MPI).
    - c. All paint manufacturers and products used shall be as listed under Approved Product List section of MPI Painting Manual.
    - d. Provide Premium Grade systems (2 top coats) as defined in MPI Architectural Painting Specification Manual, except as otherwise indicated.
    - e. Where specified paint system does not have Premium Grade, provide Budget Grade.
    - f. Provide products of same manufacturer for each coat in coating system.
    - g. Where required to meet LEED (Leadership in Energy and Environmental Design) program requirements, use only MPI listed materials having an "L" rating designation.
- B. Materials:
  1. Materials used for any painting system shall be from single manufacturer unless approved otherwise in writing by painting system manufacturers and by Architect. Include manufacturer approvals in Product Data submittal.
  2. Linseed oil, shellac, turpentine, and other painting materials shall be pure, be compatible with other coating materials, bear identifying labels on containers, and be of highest quality of an approved manufacturer listed in MPI manuals. Tinting color shall be best grade of type recommended by Manufacturer of paint or stain used on Project.

## **PART 3 - EXECUTION**

### **3.1 APPLICATORS**

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

### **3.2 EXAMINATION**

- A. Verification Of Conditions:
  1. Directing applicator to begin painting and coating work will indicate that substrates to receive painting and coating materials have been previously inspected as part of work of other Sections and are complete and ready for application of painting and coating systems as specified in those Sections.
- B. Pre-Installation Testing:
  1. Before beginning work of this Section, examine, and test surfaces to be painted or coated for adhesion of painting and coating systems.
  2. Report in writing to Architect of conditions that will adversely affect adhesion of painting and coating work.



3. Do not apply painting and coating systems until party responsible for adverse condition has corrected adverse condition.

C. Evaluation And Assessment:

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

### 3.3 PREPARATION

A. Protection Of In-Place Conditions:

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

B. Surface Preparation:

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

### 3.4 APPLICATION

A. Interface With Other Work:

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

B. Paint or finish complete all surfaces to be painted or coated as described in Contract Documents, including but not limited to following items.

1. Finish casework and wood trims that are specified to be installed under Section 06 2001 and that are not called out to be factory-or shop-finished. Back prime wood elements to be installed against concrete or masonry or that may be subjected to moisture.

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

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

- E. Spread materials smoothly and evenly. Apply coats to not less than wet and dry film thicknesses and at spreading rates for specified products as recommended by Manufacturer.
- F. Touch up suction spots after application of first finish coat.
- G. Paint shall be thoroughly dry and surfaces clean before applying succeeding coats.
- H. Use fine sandpaper between coats as necessary to produce even, smooth surfaces.
- I. Make edges of paint adjoining other materials or colors clean, sharp, and without overlapping.
- J. Finished work shall be a 'Properly Painted Surface' as defined in this Section.

### **3.5 FIELD QUALITY CONTROL**

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

### **3.6 CLEANING**

- A. General:
  - 1. As work proceeds and upon completion of work of any painting Section, remove paint spots from floors, walls, glass, or other surfaces and leave work clean, orderly, and in acceptable condition.
- B. Waste Management:
  - 1. Remove rags and waste used in painting operations from building each night. Take every precaution to avoid danger of fire.
  - 2. Paint, stain and wood preservative finishes and related materials (thinners, solvents, caulking, empty paint cans, cleaning rags, etc.) shall be disposed of subject to regulations of applicable authorities having jurisdiction.
  - 3. Remove debris caused by work of paint Sections from premises and properly dispose.
  - 4. Retain cleaning water and filter out and properly dispose of sediments.

**END OF SECTION**

**SECTION 09 9324****INTERIOR CLEAR-FINISHED HARDWOOD****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
  - 1. Preparing and finishing of new interior clear finished hardwood as described in Contract Documents.
- B. Related Requirements:
  - 1. Section 06 2210: 'Miscellaneous Wood Trim'.
  - 2. Section 06 4115: 'Rostrum Casework'.
  - 3. Section 06 4512: 'Architectural Woodwork Wood Trim'.
  - 4. Section 09 9001: 'Common Painting And Coating Requirements':
    - a. Pre-installation conference for Sections under 09 9000 heading 'Paints and Coatings'.

**1.2 REFERENCES**

- A. Association Publications:
  - 1. Architectural Woodwork Institute / Architectural Woodwork Manufacturers Association of Canada, 46179 Westlake Drive, Suite 120, Potomac Falls, VA [www.awinet.org](http://www.awinet.org).
    - a. Architectural Woodwork Standards (AWS), 1st Edition, 2009.

**1.3 ADMINISTRATIVE REQUIREMENTS**

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

**1.4 SUBMITTALS**

- A. Action Submittals:
  - 1. Samples:
    - a. Interior Hardwood for Transparent Finish:
      - 1) Requirements for samples are specified in Related Requirement Sections listed above.
    - b. Design Criteria:
      - 1) Sample will be used as performance standard for evaluating finish provided.
- B. Informational Submittals:
  - 1. Test And Evaluation Reports:
    - a. Before beginning finish work, submit Finish Manufacturer's literature or certification that finish material meets requirements of ANSI / KCMA A161.1.

**PART 2 - PRODUCTS****2.1 SYSTEM**

- A. Materials:

1. Stain: MPI 90, 'Stain, Semi-Transparent, for Interior Wood'.
  2. Clear Finish Coats:
    - a. Field Finished:
      - 1) Chemcraft International Inc:
        - a) First, Second, And Third Coats: 20 Sheen Opticlear Pre-Catalyzed Lacquer.
      - 2) ICI Dulux / Trinity:
        - a) First Coat: ICE Vinyl Sanding Sealer.
        - b) Second And Third Coats: ICI Pre-Catalyzed Lacquer.
      - 3) Lilly / Valspar:
        - a) First, Second, And Third Coats: 20 Sheen Pre-Catalyzed Lacquer 587E208.
      - 4) Sherwin-Williams:
        - a) First Coat: T67F3 Vinyl Sealer.
        - b) Second And Third Coats: T77F38 Sherwood Pre-Catalyzed Lacquer DRE.
    - b. Mill Finished: Architectural Woodwork finished in a mill may use one (1) coat of Vinyl Sealer and two (2) coats of Conversion Varnish or three (3) coats of Conversion Varnish from one (1) of the approved Finish Manufacturers, as recommended by Finish Manufacturer.
    - c. Products meeting testing requirements for finishes of ANSI / KCMA A161.1 may be used upon approval of submission by Architect before use. See Section 01 6200.
  3. Color:
    - a. Design Criteria:
      - 1) Finish to match Owner selected sample.
    - b. Approved Finish:
      - 1) Performance standard: Owner provided sample of existing wood item from existing project to be used as Control Sample.
- B. Performance:
1. Design Criteria: General: See appropriate paragraphs of Section 09 9001.

## **PART 3 - EXECUTION**

### **3.1 APPLICATION**

- A. General:
1. See appropriate paragraphs of Section 09 9001.
  2. Sand entire exposed surface of item to be finished lightly with 120 to 150 non-steared 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-steared sandpaper between application of application stain and first finish coat.
  5. If wood is finished before installation, finish cut ends and other unfinished, exposed surfaces same as previously finished surfaces after installation of wood.
- B. Where back-priming is required, apply one coat of finish material.
- C. Softwood Components:
1. Where Douglas Fir serves as a component part (shelves, backs, etc) of hardwood cabinets, use same specification as for hardwood finish, but as sufficient 1:1 mix of sanding sealer / Mineral spirits with stain to make color of Pine or Douglas Fir grains approximate color of finish hardwood.
  2. Coat interior surfaces of Drawers with one (1) coat high gloss urethane varnish.

**END OF SECTION**

## **DIVISION 12: FURNISHINGS**

### **12 2000 WINDOW TREATMENTS**

12 2200 CURTAINS AND DRAPES

END OF TABLE OF CONTENTS

**SECTION 12 2200****CURTAINS AND DRAPES****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To
1. Furnish and install draperies, curtains, and hardware as described in Contract Documents.

**1.2 REFERENCES**

- A. Definitions:
1. Approved Agency: An established and recognized agency that is regularly engaged in conducting tests of furnishing inspection services, where such agency has been approved by the building official.
  2. Flame-proofing: Process of treating materials chemically so that they will not support combustion.
  3. Flame Spread. The propagation of flame over a surface.
  4. Flammable Material: Material capable of being readily ignited from common sources of heat or at a temperature of 600 deg F (316 deg C) or less.
  5. Inherently Flame Resistant: Material that meets requirements set forth in NFPA 701. Inherently flame resistant fabric is woven from fibers that are non-combustible for life of material.
- B. Reference Standards:
1. International Building Code (2015 IBC):
    - a. Chapter 8, 'Interior Finishes':
      - 1) Section 806, 'Decorative Materials And Trim':
        - a) 806.4, 'Acceptance Criteria And Reports'.
  2. National Fire Protection Association:
    - a. NFPA 289, 'Standard Method of Fire Test for Individual Fuel Packages' (2013 Edition).
    - b. NFPA 701, 'Methods of Fire Tests for Flame Propagation of Textiles and Films' (2015 Edition).

**1.3 SUBMITTALS**

- A. Action Submittals:
1. Product Data:
    - a. Flame-proofing literature.
  2. Samples:
    - a. 24 inch (600 mm) wide and 48 inch (1 200 mm) high sample including all specified elements of finished curtains, including flame retardant certification tag. Do not fabricate Project drapes until sample has been reviewed and approved by Architect.
    - b. Submit sample with Product Data submittal. Sample will serve as standard by which to evaluate Project curtains.
- B. Informational Submittals:
1. Certificates:
    - a. Certificate from approved agency showing compliance to IBC 806.4 requirements.
  2. Qualification Statement:
    - a. Fabricator / 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) Operating and maintenance instructions.
  - b. Record Documentation:
    - 1) Manufacturers documentation:
      - a) Fabric Supplier's literature or cut sheets on fabric.
      - b) Curtain Rod Manufacturer's literature or cut sheets.
      - c) Color and style selection.
      - d) Certificate of compliance from approved agency.

## 1.4 QUALITY ASSURANCE

- A. Regulatory Agency Sustainability Approvals:
  1. Meet requirements of IBC 806.4 'Acceptance Criteria And Reports':
    - a. Where required to exhibit improved fire performance, curtains, draperies, fabric hangings and similar combustible decorative materials suspended from walls or ceilings shall be tested by an approved agency and meet the flame propagation performance criteria of Test 1 or 2, as appropriate, of NFPA 701, or exhibit maximum heat release rate of 100 kW when tested in accordance with NFPA 289, using 20 kW ignition source. Reports of test results shall be prepared in accordance with test method used and furnished to building official upon request.
  2. Attach permanent tag to each panel attesting to flame retardant quality of material used.
- B. Qualifications:
  1. Fabricator / Installer: Requirements of Section 01 4301 applies, but not limited to following:
    - a. Minimum three (3) satisfactorily completed installations of comparable quality, scope, similar size, and complexity in past two (2) years before bidding.
    - b. Upon request, submit documentation.

## PART 2 - PRODUCTS

### 2.1 ASSEMBLIES

- A. Manufacturers / Suppliers:
  1. Carole, Augusta, GA [www.carolefabrics.com](http://www.carolefabrics.com).
  2. Charles Samulsen, New York City, NY [www.csamelson.com](http://www.csamelson.com).
  3. Conso / Wright, West Warren, MI [www.conso.com](http://www.conso.com).
  4. Coral, Div Charles Samelson, New York City, NY [www.coralofchicago.com](http://www.coralofchicago.com).
  5. Fred Krieger & Co. Inc., Jericho, NY [www.fredkriegerfabrics.com](http://www.fredkriegerfabrics.com).
  6. Graber Div of Springs Industries, Montgomery, PA [www.graberblinds.com](http://www.graberblinds.com).
  7. Hanes Fabric Co, Conover, NC [www.hanesfabric.com](http://www.hanesfabric.com).
  8. InterSpec, Allenwood, NJ (800) 526-2800 or (732) 938-4114.
  9. Kirsch Co, Freeport, IL [www.kirsch.com](http://www.kirsch.com).
  10. Rockland Industries Inc, Baltimore, MD [www.roc-lon.com](http://www.roc-lon.com).
  11. Rowley Co, Gastonia, NC. [www.rowleyco.com](http://www.rowleyco.com).
- B. Materials:
  1. Design Criteria:
    - a. Curtains and draperies must meet flame propagation performance requirements as specified in Quality Assurance in Part 1 of this specification.
  2. Fabric: Match existing drapery in Chapel from one of the following:
    - a. Category Four Approved Products. See Section 01 6200 for definitions of Categories.
      - 1) Casements:
        - a) 5th Avenue or Bourbon Street (off white) by Coral.
        - b) Fayette, Rosette, or Dixie by Interspec: White.

- c) Layton by InterSpec: White.
    - d) Snowbird by InterSpec: Ivory, White.
  - 2) Blackout Drapery.
    - a) Liteless by Coral.
    - b) FlameTrol 540 - White by Hanes.
    - c) Roc-Lon Budget Blackout (3-pass) FR, white/white or ivory/white by Rockland Industries.
- 3. Crinoline / Buckram:
  - a. Heavy or Extra Heavy grade, 4 inches (100 mm) wide, woven permanent goods.
  - b. Type Two Acceptable Products:
    - 1) BW74 by R H Rowley Co.
    - 2) 61421 by Conso.
    - 3) Equal as approved by Architect before use. See Section 01 6200.
- 4. Drapery Hooks: Stainless steel, standard 1-1/2 inch (38 mm) hook with pointed hook top.
- 5. Drapery Rods:
  - a. Outside Mount:
    - 1) Rods shall be sufficient width, window width plus 1/3, to allow drape to stack clear of window opening but no wider. This requirement may be modified as follows:
      - a) Where Drawings detail differently.
      - b) Where wall, cabinets, mechanical equipment, or other obstruction requires modification.
      - c) Where symmetry of room would indicate desirability of exception.
  - b. Traverse rods shall include wall or floor mounted tension pulleys for endless cord operation.
  - c. Category Four Approved Products. See Section 01 6200 for definitions of Categories.
    - 1) Kirsch:
      - a) 'Super Fine': Less than 15 feet (4.57 m) long.
      - b) 'Architrac': 15 feet (4.57 m) long and longer.
    - 2) Graber Super Heavy Duty 600 Series by Springs Industries.

### C. Fabrication:

- 1. Double top and bottom hems unless specifically specified otherwise.
- 2. Provide necessary weights at seam and side hems.
- 3. Fullness shall be minimum of 2-1/2 times width of space covered by drape.
- 4. Space pleats 4 inches (100 mm) maximum center of pleat to center of pleat.
- 5. Drapes shall have:
  - a. Fabric inspected over back-lite table for flaws.
  - b. Straight, even blind-stitched side and bottom hems.
  - c. Seams hidden beside pleats.
  - d. Joined seams serged and overcast with no puckering.
  - e. 4 inch (100 mm) double bottom hems and headings.
  - f. 1-1/2 inches (38 mm) double side hem.
  - g. 2 inch (50 mm) overlap, total of 4 inches (100 mm) on pair.
  - h. Stack-off of 1/3 of window width.
  - i. Specified woven, permanent crinoline / buckram used in heading.
  - j. Seams match up on bottom hems.
  - k. Corners of bottom hems closed with hand stitching.
  - l. Pleats evenly spaced to size.
  - m. Straight edge across top after pleating.
  - n. Straight, even folds.
  - o. Polyester thread matching fabric color for seams and hems.

## PART 3 - EXECUTION

### 3.1 FABRICATORS

#### A. Acceptable Fabricators:

- 1. Meet Quality Assurance Fabricator / Installer Qualifications as specified in Part 1 of this specification.



### **3.2 INSTALLATION**

- A. Install tracks, wall or ceiling mount, with mounting device head no larger than No. 6, to yield direct withdrawal strength of 25 lbs (11 kg) minimum.
- B. Support spacing to be as recommended in Manufacturer's literature.
- C. Install blackout drapery as a separate drape on separate rod behind primary drape.

### **3.3 CLEANING**

- A. Tracks to be free of marring, scratches, and foreign material.

**END OF SECTION**

## **DIVISION 26: ELECTRICAL**

### **26 0500 COMMON WORK RESULTS FOR ELECTRICAL**

- 26 0501 COMMON ELECTRICAL REQUIREMENTS
- 26 0519 LINE-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES
- 26 0526 GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS
- 26 0533 RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS
- 26 0613 ELECTRICAL EQUIPMENT MOUNTING HEIGHT SCHEDULE

### **26 2000 LOW-VOLTAGE ELECTRICAL TRANSMISSION**

- 26 2726 WIRING DEVICES

END OF TABLE OF CONTENTS

**SECTION 26 0501****COMMON ELECTRICAL REQUIREMENTS****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
  - 1. General electrical system requirements and procedures.
  - 2. Make electrical connections to equipment provided under other Sections.
- B. Related Requirements:
  - 1. Section 02 4119: 'Selective Structure Demolition' for salvage of existing electrical items to be reused or recycled.

**1.2 REFERENCES**

- A. Reference Standards:
  - 1. National Fire Protection Association / American National Standards Institute:
    - a. NFPA 70, 'National Electrical Code (NEC)' (2017 or most recent edition adopted by AHJ).
  - 2. National Electrical Manufacturing Association Standards (NEMA):
    - a. NEMA 250-2018, 'Enclosure for Electrical Equipment (1000 Volts Maximum)'.

**1.3 ADMINISTRATIVE REQUIREMENTS**

- A. Coordination:
  - 1. Coordinate with Owner for equipment and materials to be removed by Owner.
- B. Sequencing:
  - 1. Include detailed sequence of individual electrical demolition operations on Construction Schedule specified in Section 01 3200.

**1.4 QUALITY ASSURANCE**

- A. Regulatory Agency Sustainability Approvals:
  - 1. NEC and local ordinances and regulations shall govern unless more stringent requirements are specified.
  - 2. Material and equipment provided shall meet standards of NEMA or UL and bear their label wherever standards have been established and label service is available.
- B. Qualifications: Requirements of Section 01 4301 applies, but not limited to following:
  - 1. Electrical Subcontractor:
    - a. Company specializing in performing work of this section.
      - 1) Minimum five (5) years experience in electrical installations.
      - 2) Minimum five (5) satisfactorily completed installations in past three (3) years of projects similar in size, scope, and complexity required for this project before bidding.
    - b. Upon request, submit documentation.
  - 2. Installer:
    - a. Licensed for area of Project.
    - b. Designate one (1) individual as project foremen who shall be on site at all times during installation and experienced with installation procedures required for this project.
    - c. Upon request, submit documentation.

**PART 2 - PRODUCTS****PART 3 - EXECUTION****3.1 INSTALLERS**

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

**3.2 EXAMINATION**

- A. Verification Of Conditions:
  - 1. Confirm dimensions, ratings, and specifications of equipment to be installed and coordinate these with site dimensions and with other Sections.
- B. Evaluation And Assessment:
  - 1. All relocations, reconnections, and removals are not necessarily indicated on Drawings. Include such work without additional cost to Owner.

**3.3 PREPARATION**

- A. Disconnect equipment that is to be removed or relocated. Carefully remove, disassemble, or dismantle as required, and store in approved location on site, existing items to be reused in completed work.
- B. Where affected by demolition or new construction, relocate, extend, or repair raceways, conductors, outlets, and apparatus to allow continued use of electrical system. Use methods and materials as specified for new construction.
- C. Perform drilling, cutting, block-offs, and demolition work required for removal of necessary portions of electrical system. Do not cut joists, beams, girders, trusses, or columns without prior written permission from Architect.
- D. Remove concealed wiring abandoned due to demolition or new construction. Remove circuits, conduits, and conductors that are not to be re-used back to next active fixture, device, or junction box.
- E. Patch, repair, and finish surfaces affected by electrical demolition work, unless work is specifically specified to be performed under other Sections of the specifications.

**3.4 INSTALLATION**

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

**3.5 FIELD QUALITY CONTROL****A. Field Tests:**

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

**3.6 CLEANING**

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

**3.7 CLOSEOUT ACTIVITIES****A. Training:**

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

**END OF SECTION**

**SECTION 26 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 26 0501: 'Common Electrical Requirements'.

**1.2 REFERENCES**

- A. Definitions:
  - 1. Line Voltage: Over 70 Volts.
- B. Reference Standards:
  - 1. National Fire Protection Association:
    - a. NFPA 70, 'National Electric Code (NEC)' (2017 or most recent edition adopted by AHJ including all applicable amendments and supplements).
      - 1) Article 334, "Nonmetallic-Sheathed Cable, Types NM, NMC And NMS'.

**PART 2 - PRODUCTS****2.1 SYSTEMS**

- A. Line Voltage Conductors:
  - 1. Copper with AWG sizes as shown:
    - a. Minimum size shall be No. 12 except where specified otherwise.
    - b. Conductor size No. 8 and larger shall be stranded.
  - 2. Insulation:
    - a. Standard Conductor Size No. 10 And Smaller: 600V type THWN or XHHW (75 deg F (24 deg C)).
    - b. Standard Conductor Size No. 8 And Larger: 600V Type THW, THWN, or XHHW (75 deg F (24 deg C)).
    - c. Higher temperature insulation as required by NFPA 70 or local codes.
  - 3. Colors:
    - a. 208Y / 120 V System:
      - 1) Black: Phase A.
      - 2) Red: Phase B.
      - 3) Blue: Phase C.
      - 4) Green: Ground.
      - 5) White: Neutral.
    - b. 480Y / 277 Volt System:
      - 1) Brown: Phase A.
      - 2) Orange: Phase B.
      - 3) Yellow: Phase C.
      - 4) Gray: Neutral.
      - 5) Green: Ground.
    - c. 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.

- d. For feeder conductors larger than No. 10 at pull boxes, gutters, and panels, use painted or taped band or color tag color-coded as specified above.
- B. Line Voltage Cables:
1. Metal Clad Cable (MC) may be used as restricted below:
    - a. Copper conductors.
    - b. Sizes #12 through #8.
    - c. Use only in indoor dry locations where:
      - 1) Not subject to damage.
      - 2) Not in contact with earth.
      - 3) Not in concrete.
- C. Standard Connectors:
1. Conductors No. 8 And Smaller: Steel spring wire connectors.
  2. Conductors Larger Than No. 8: Pressure type terminal lugs.
  3. Connections Outside Building: Watertight steel spring wire connections with waterproof, non-hardening sealant.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. General:
1. Conductors and cables shall be continuous from outlet to outlet.
  2. Do not use direct burial cable.
- B. Line Voltage Conductors:
1. Install conductors in raceway where indicated on Contract Drawings. Run conductors of different voltage systems in separate conduits.
  2. Route circuits at own discretion, however, circuiting shall be as shown in Panel Schedules. Group circuit homeruns to panels as shown on Contract Drawings.
  3. Neutrals:
    - a. On three-phase, 4-wire systems, do not use common neutral for more than three circuits.
    - b. On single-phase, 3-wire systems, do not use common neutral for more than two circuits.
    - c. Run separate neutrals for each circuit where specifically noted on Contract Drawings.
    - d. Where common neutral is run for two or three home run circuits, connect phase conductors to breakers in panel which are attached to separate phase legs:
      - 1) Provide breaker tie so that all circuits that share common neutral are simultaneously disconnected.
      - 2) Neutral conductors shall be of same size as phase conductors unless specifically noted otherwise.
  4. Pulling Conductors:
    - a. Do not pull conductors into conduit until raceway system is complete and cabinets and outlet boxes are free of foreign matter and moisture.
    - b. Do not use heavy mechanical means for pulling conductors.
    - c. Use only listed wire pulling lubricants.
- C. Line Voltage Cables:
1. Route circuits at own discretion, however, circuiting and numbering shall be as shown in Panel Schedules.
  2. Support cables using approved staples, cable ties, straps, hangers, or similar fittings, spaced as required.
  3. Where installing in framing, do not bore holes in joists or beams outside center 1/3 of member depth or within 24 inches (600 mm) of bearing points. Do not bore holes in vertical framing members outside center 1/3 of member width. Holes shall be one inch diameter maximum.

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

**END OF SECTION**



**SECTION 26 0526****GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
  - 1. Furnish and install grounding for electrical installation as described in Contract Documents except as excluded below.
- B. Related Requirements:
  - 1. Section 26 0501: 'Common Electrical Requirements'.

**1.2 REFERENCES**

- A. Reference Standards:
  - 1. Institute of Electrical and Electronics Engineers (IEEE):
    - a. IEEE 837-2014, 'Standard for Qualifying Permanent Connections Used in Substation Grounding'.
  - 2. National Fire Protection Association:
    - a. NFPA 70, 'National Electric Code (NEC)' (2017 or most recent edition adopted by AHJ including all applicable amendments and supplements).
    - b. NFPA 780, 'Standard for the Installation of Lightning Protection Systems' (2014 or latest approved edition).
  - 3. Telecommunications Industry Association:
    - a. TIA-942 A, 'Telecommunications Infrastructure Standard for Data Centers' (2014).
  - 4. Section 27 1116: 'Communications Cabinets, Racks, Frames, and Enclosures'.
  - 5. Section 27 1501: 'Communications Horizontal Cabling' for cables for Telephone and Data Systems.

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

**1.4 QUALITY ASSURANCE**

- A. Regulatory Agency Sustainability Approvals:
  - 1. Requirements of Section 27 1501 applies, but is not limited to following:
    - a. 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.
    - b. Grounding shall conform to all required Commercial Building Grounding and Bonding Requirements for Telecommunications, Electrical Codes, and Manufacturer's grounding requirements.
  - 2. Systems shall be installed per NFPA 780 and NFPA 70.
  - 3. All Bonds shall comply with most current version of IEEE 837 Standard.
- 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](http://www.erico.com).
    - b. 'ThermOweld' by Continental Industries, Tulsa, NE [www.conind.com](http://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 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 foundation ground loop 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. 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.
- D. 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.
- E. Provide grounding bushings on all feeder conduit entrances into panelboards and equipment enclosures.
- F. Bond conduit grounding bushings to enclosures with minimum #10 AWG conductor.
- G. 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.
- H. Run separate insulated grounding cable from each equipment cabinet to electrical panel. Do not use intermediate connections or splices. Affix directly to cabinet.
- I. On motors, connect ground conductors to conduit with approved grounding bushing and to metal frame with bolted solderless lug.
- J. Ground cabinet of transformers to conduit and ground wires, if installed. Bond transformer secondary neutral conductor to cabinet.
- K. 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.
- L. Ground rack to TGB using #6 copper conductor and compression connector.

**END OF SECTION**

**SECTION 26 0533****RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
1. Quality of material and installation procedures for raceway, boxes, and fittings used on Project but furnished under other Divisions.
  2. Furnish and install raceway, conduit, and boxes used on Project not specified to be installed under other Divisions.
- B. Related Requirements:
1. Section 26 0501: 'Common Electrical Requirements' for general electrical requirements'.
  2. Section 27 1501: 'Communications Horizontal Cabling' for raceway for telephone and data systems.
  3. Section 27 5117: 'Audio Systems' for sound system wiring.

**1.2 REFERENCES**

- A. Reference Standards:
1. National Fire Protection Association:
    - a. NFPA 70, 'National Electric Code (NEC)' (2017 or most recent edition adopted by AHJ including all applicable amendments and supplements).

**PART 2 - PRODUCTS****2.1 SYSTEM**

- A. Manufacturers:
1. Manufacturer Contact List:
    - a. Cooper B-Line, Highland, IL [www.b-line.com](http://www.b-line.com).
    - b. Hubbell Incorporated, Milford, CT [www.hubbell-wiring.com](http://www.hubbell-wiring.com) or Hubbell Canada Inc, Pickering, ON (905) 839-4332.
    - c. Square D, Palatine, IL [www.squared.com](http://www.squared.com).
    - d. Thomas & Betts, Memphis, TN [www.tnb.com](http://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](http://www.wiremold.com).
- B. Materials:
1. Raceway And Conduit:
    - a. Sizes:
      - 1) 3/4 inch (19 mm) for exterior use, unless indicated otherwise.
      - 2) 1/2 inch (13 mm) for interior use, unless indicated otherwise.
    - b. Types: Usage of each type is restricted as specified below by product.
      - 1) Galvanized rigid steel or galvanized intermediate metal conduit (IMC) is allowed for use in all areas. Where in contact with earth or concrete, wrap buried galvanized rigid steel and galvanized IMC conduit and fittings completely with vinyl tape.
      - 2) Galvanized Electrical Metallic Tubing (EMT) and Flexible Steel Conduit:
        - a) Allowed for use only in indoor dry locations where it is:

- (1) Not subject to damage.
        - (2) Not in contact with earth.
        - (3) Not in concrete.
      - b) For metal conduit systems, flexible steel conduit is required for final connections to indoor mechanical equipment.
    - 3) Schedule 40 Polyvinyl Chloride (PVC) Conduit:
      - a) Allowed for use only underground or below concrete with galvanized rigid steel or IMC elbows and risers.
    - 4) Listed, Liquid-Tight Flexible Metal Conduit:
      - a) Use in outdoor final connections to mechanical equipment, length not to exceed 36 inches (900 mm).
    - 5) Pre-wired 3/8 Inch (9.5 mm) Flexible Fixture Whips: Allowed only for connection to recessed lighting fixtures, lengths not to exceed 72 inches (1 800 mm).
  - c. Prohibited Raceway Materials:
    - 1) Aluminum conduit.
    - 2) Armored cable type AC (BX) cable.
2. Raceway And Conduit Fittings:
  - a. Rigid Steel Conduit And IMC: Threaded and designed for conduit use.
  - b. EMT:
    - 1) Compression type.
    - 2) Steel set screw housing type.
  - c. PVC Conduit:
    - 1) PVC type. Use PVC adapters at all boxes.
    - 2) PVC components, (conduit, fittings, cement) shall be from same Manufacturer.
  - d. Flexible Steel Conduit: Screw-in type.
  - e. Liquid-tight Flexible Metal Conduit: Sealtite type.
  - f. Expansion fittings shall be equal to OZ Type AX sized to raceway and including bonding jumper.
  - g. Prohibited Fitting Materials:
    - 1) Crimp-on, tap-on, indenter type fittings.
    - 2) Cast set-screw fittings for EMT.
    - 3) Spray (aerosol) PVC cement.
3. 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. Power Floor Boxes:
  - a. Type Two Acceptable Products:
    - 1) 887 cast iron box 885 brass duplex cover plate for carpet by Walker Systems.
    - 2) B-2537 cast iron box with SF3925 brass duplex cover plate for carpet by Hubbell.
    - 3) Equal as approved by Architect before installation. See Section 01 6200.
5. 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](http://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. Before rough-in, verify locations of boxes with work of other trades to insure that they are properly located for purpose intended.
  - a. Coordinate location of outlets adjacent to or in millwork with Division 06 before rough-in. Refer conflicts to Architect and locate outlets under his direction.
3. Coordinate installation of floor boxes in carpeted areas with carpet installer to obtain carpet for box covers.
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 and video system electrical components furnished and installed under this Section include following items:
  - a. Fittings.

#### 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. Seal all raceways penetrating fire rated walls, ceilings and barriers. See Section 07 8400.
3. Keep raceway runs 6 inches (150 mm) minimum from hot water pipes.
4. Make no more than four quarter bends, 360 degrees total, in any conduit run between outlet and outlet, fitting and fitting, or outlet and fitting.
  - a. Make bends and offsets so conduit is not injured and internal diameter of conduit is not effectively reduced.
  - b. Radius of curve shall be at least minimum indicated by NFPA 70.
5. Cut conduit smooth and square with run and ream to remove rough edges. Cap raceway ends during construction. Clean or replace raceway in which water or foreign matter have accumulated.
6. Install insulated bushings on each end of raceway 1-1/4 inches (32 mm) in diameter and larger, and on all raceways where cables emerge. Install expansion fittings where raceways cross building expansion joints.
7. Bend PVC conduit by hot box bender and, for PVC 2 inches (50 mm) in diameter and larger, expanding plugs. Apply PVC adhesive only by brush.
8. Installation In Framing:
  - a. Do not bore holes in joists or beams outside center 1/3 of member depth or within 24 inches (600 mm) of bearing points. Do not bore holes in vertical framing members outside center 1/3 of member width.
  - b. Holes shall be one inch (25 mm) diameter maximum.
9. 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. Telephone / Data Systems:
1. Install raceway from terminal board to each telephone and data outlet as indicated on Contract Drawings.
- E. Boxes:
1. Boxes shall be accessible and installed with approved cover.
  2. Do not locate device boxes that are on opposite sides of framed walls in the same stud space. In other wall construction, do not install boxes back to back.
  3. Locate boxes so pipes, ducts, or other items do not obstruct outlets.
  4. Install outlets flush with finished surface and level and plumb.
  5. Support switch boxes larger than two-gang with side brackets and steel bar hangers in framed walls.
  6. At time of substantial completion, install blank plates on uncovered outlet boxes that are for future use.
  7. Install air-vapor barrier boxes.
    - a. Follow Manufacturer's installation instructions.
  8. Location:
    - a. Install boxes at door locations on latch side of door, unless explicitly shown otherwise on Contract Drawings. Verify door swings shown on electrical drawings with architectural drawings, and report discrepancies to Architect before rough-in. Distance of box from jamb shall be 6 inches (150 mm) from door jamb.
    - b. Properly center boxes located in walls with respect to doors, panels, furring, trim and consistent with architectural details. Where two or more outlets occur, space them uniformly and in straight lines with each other, if possible.
    - c. Center ceramic tile boxes in tile.

**END OF SECTION**

**SECTION 26 0613**

**ELECTRICAL EQUIPMENT MOUNTING HEIGHT SCHEDULE**

**PART 1 - GENERAL: Not Used**

**PART 2 - PRODUCTS: Not Used**

**PART 3 - EXECUTION**

**3.1 INSTALLATION**

- A. Unless otherwise indicated, mount center of outlets or boxes at following heights above finish floor. Refer special conditions to Architect before rough-in and locate outlet under his direction.
  
- B. Mounting Heights:
  - 1. Electrical:
    - a. Receptacles: 18 inches (450 mm).
    - b. Wall Switches: 42 inches (1 065 mm).
  - 2. Communications
    - a. Sound Distribution System Components: As indicated on Drawings.
    - b. Data (desk type): 18 inches (450 mm).

**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 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](http://www.cooperwiringdevices.com).
    - b. General Electric Industrial Systems, Charlotte, NC [www.geindustrial.com](http://www.geindustrial.com).
    - c. Hubbell Building Automation, Austin, TX [www.hubbell-automation.com](http://www.hubbell-automation.com).
    - d. Hubbell Inc, Milford, CT [www.hubbell-wiring.com](http://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](http://www.huntdimming.com).
    - f. Intermatic Inc, Spring Grove, IL [www.intermatic.com](http://www.intermatic.com).
    - g. IR-TEC America, Inc., Brea, CA [www.irtec.com/en-ira/](http://www.irtec.com/en-ira/).
    - h. Leviton Manufacturing Co, Little Neck, NY [www.leviton.com](http://www.leviton.com) or Leviton Manufacturing of Canada Ltd, Pointe-Claire, QB (800) 461-2002 or (514) 954-1840.
    - i. Legrand, West Hartford, CT [www.legrand.us.com](http://www.legrand.us.com) or Vaughan, ON [www.legrand.ca.com](http://www.legrand.ca.com).
    - j. Lutron Electronics Co Inc, Coopersburg, PA [www.lutron.com](http://www.lutron.com).
    - k. Ortronics, New London, CT [www.ortronics.com](http://www.ortronics.com).
    - l. Paragon Electric Co Inc, Carol Stream, IL [www.icca.invensys.com/paragon](http://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](http://www.passandseymour.com) or Pass & Seymour Canada Inc, Concord, ON (905) 738-9195.
    - n. Philips Lighting Co, Somerset, NJ [www.lighting.philips.com/nam](http://www.lighting.philips.com/nam) or Philips Lighting Canada, Scarborough, ON (416) 292-3000.
    - o. Red Dot div of Thomas & Betts, Memphis, TN [www.tnbcom](http://www.tnbcom).
    - p. Schneider Electric North America, Palatine, IL [www.schneider-electric.com](http://www.schneider-electric.com) (847) 397-2600.
    - q. Sensorswitch, Wallingford, CT [www.sensorswitch.com](http://www.sensorswitch.com).
    - r. Siemon Company, Watertown, CT [www.siemon.com](http://www.siemon.com).
    - s. Square D Co, Palatine, IL [www.squared.com](http://www.squared.com).
    - t. Suttle, Hector, MN [www.suttleonline.com](http://www.suttleonline.com).
    - u. Tork Inc, Mount Vernon, NY [www.tork.com](http://www.tork.com).
    - v. Watt Stopper Inc, Santa Clara, CA [www.wattstopper.com](http://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. Match Existing.
- 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.
- D. Plates:
  - 1. Standard Cover Plates:
    - a. Office / Occupied Areas:
      - 1) Nylon or high impact resistant thermoplastic.
      - 2) Color shall match wiring device.
    - b. All Other: Steel.
    - c. Ganged switches shall have gang plates.
    - d. Category Four Approved Manufacturers. See Section 01 6200 for definitions of Categories:
      - 1) Cooper.
      - 2) Hubbell.
      - 3) Leviton.
      - 4) Pass & Seymour.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION**

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

**END OF SECTION**

**DIVISION 27: COMMUNICATIONS**

**27 1000 STRUCTURED CABLING**

27 1501 COMMUNICATIONS HORIZONTAL CABLING

**27 5000 DISTRIBUTED COMMUNICATIONS AND MONITORING SYSTEMS**

27 5117 AUDIO SYSTEMS

END OF TABLE OF CONTENTS

**SECTION 27 1501****COMMUNICATIONS HORIZONTAL CABLING****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
1. Furnish, install, and test communications horizontal cabling as described in Contract Documents including following:
    - a. Cables and related terminations.
- B. Related Requirements:
1. Division 26: Raceways and surface boxes.
  2. Section 26 0526: 'Grounding And Bonding For Electrical Systems' for installation and termination.
  3. Section 27 5117: 'Audio Systems'.

**1.2 REFERENCES**

- A. Association Publications:
1. British Standards Institution (BSI):
    - a. BS EN 50310:2006, 'Application of Equipotential Bonding and Earthing in Buildings with Information Technology Equipment'.
  2. Building Industry Consulting Service International (BISCI):
    - a. *Information Transport Systems Installation Methods Manual (ITSIMM)* (5<sup>th</sup> Edition).
    - b. *Telecommunications Distribution Methods Manual (TDMM)* (12<sup>th</sup> Edition).
  3. Institute of Electrical and Electronics Engineers:
    - a. IEEE 802.3-2018, '*Standard for Ethernet*'.
    - b. IEEE 1100-2005, '*Recommended Practice for Powering and Grounding Electric Equipment*'.
  4. Telecommunications Industry Association:
    - a. TIA TSB-162, 'Telecommunication Cabling Guidelines for Wireless Access Points' (November 2013).
- B. Reference Standards:
1. International Electrotechnical Commission:
    - a. IEC 60603-7:2011, 'Connectors for electronic equipment – Part 7 'Detail specification for 8-way, unshielded, free and fixed connectors'.
  2. International Organization for Standardization / International Electrotechnical Commission:
    - a. ISO/IEC 11801 ED.2.0 EN CORR3:2008, 'Information Technology-Generic Cabling for Customer Premises'.
  3. National Fire Protection Association:
    - a. NFPA 70, 'National Electrical Code (NEC)' (2017 or most recent edition adopted by AHJ).
  4. Telecommunications Industry Association:
    - a. TIA-568.2, 'Balanced Twisted-Pair Telecommunications Cabling and Components Standards' (Revision D, 2018).
    - b. TIA-569, 'Telecommunications Pathways And Spaces' (Revision D, 2015).
    - c. TIA-606, 'Administration Standard for Telecommunications Infrastructure' (Revision C, 2017).
    - d. TIA-607, 'Telecommunications Bonding and Grounding (Earthing) for Customer Premises' (Revision C, 2015).
    - e. TIA-758, 'Customer-Owned Outside Plant Telecommunication Infrastructure Standard' (Revision B, 2012).
    - f. TIA-942, 'Telecommunications Infrastructure Standard for Data Centers' (Revision B, 2017).

- g. TIA-1152, 'Requirements for Field Test Instruments and Measurements for Balanced Twisted-Pair Cabling' (Revision A 2016).
- 5. Underwriters Laboratories:
  - a. UL 94: The Standard for Safety of Flammability of Plastic Materials for Parts in Devices and Appliances Testing (March 2013 6th Edition).
    - 1) 94HB, 'Horizontal Burn Test'.

### 1.3 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
  - 1. Coordinate with Project Manager and/or Facility Manager well in advance of Substantial Completion for installation of all Owner Furnished Network Equipment.

### 1.4 QUALITY ASSURANCE

- A. Regulatory Agency Sustainability Approvals:
  - 1. System shall meet approval of authority having jurisdiction (AHJ). NEC and State and/or local ordinances and regulations shall govern unless more stringent requirements are specified.
  - 2. Meet all TIA/EIA commercial building wiring standards.
  - 3. Meet Telecommunications Distribution Methods Manual (TDMM) (12<sup>th</sup> Edition) requirements for installation and testing.
  - 4. All Networks shall be installed per applicable standards and manufacturer's guidelines.
  - 5. 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.
  - 6. Grounding shall conform to all required Commercial Building Grounding and Bonding Requirements for Telecommunications, Electrical Codes, and Manufacturer's grounding requirements.
  - 7. Installers Qualifications:
    - a. Three (3) year experience with similar projects. Provide documentation.
- B. Warranty:
  - 1. Cabling System:
    - a. Provide standard one (1) year warranty for cabling system.

## PART 2 - PRODUCTS

### 2.1 SYSTEMS

- A. Manufacturers:
  - 1. Category Four Approved Manufacturers and Products. See Section 01 6200 for definitions of Categories:
    - a. Belden, St. Louis, MO [www.belden.com](http://www.belden.com).
    - b. Panduit Corporation, Tinley Park IL [www.panduit.com](http://www.panduit.com).
    - c. Systimax Solutions, a CommScope Company, Hickory, NC [www.systimax.com](http://www.systimax.com).
    - d. The Siemon Company, Watertown, CT [www.siemon.com](http://www.siemon.com).
- B. Design Criteria:
  - 1. Must install single manufacture as complete permanent link.
    - a. Category 6 minimum compliance margin on all parameters beyond category 6 and Power Sum ACR out to 250 MHz.
  - 2. Entire Category 6 system to be provided by single approved Manufacturer throughout.
  - 3. Install structured cabling system that will be able to support interconnections to active telecommunications equipment for voice and data applications in multi vendor, multi product environment. Structured cabling system should adhere to TIA-568, TIA-606; TIA-607, and TIA-942 standards with respect to pathways, distribution, administration, and grounding of the system.

4. Each room drop will consist of two drops each consisting of two terminations can be interoperable to accommodate either voice or data applications. Provide convenience phone drops that will consist of single termination that will be installed in proper faceplate for each location's phone.
  5. Install, terminate, test, and guarantee each drop according to customer all applicable standards and customer preferences.
  6. Horizontal cables will be rated Category 6 (250 MHz) in performance and rated to comply with TIA-568 to connector outlets at Work Area. Horizontal cables will home run back to Technology Room (Entrance Facility / Main Cross Connect) and will terminate on individual Category 6 rated jacks to populate modular 48 port angled patch panel on open or flat patch panel inside enclosures. All cables will be patched at cutover as interconnection into floor serving active equipment using RJ45 modular equipment cables rated to Category 6.
  7. Match additions to horizontal raceway to complete system according to TIA-568 where suspension and protection gaps exist.
- C. Components – Work Area Subsystem:
1. Provide connectivity equipment used to connect horizontal cabling subsystem and equipment in work area. Both copper and fiber media shall be supported. Connectivity equipment shall include following options:
    - a. Patch (equipment) cords and modular connectors.
    - b. Outlets and surface mount boxes.
    - c. Surface raceway and outlet poles.
    - d. Consolidation point / MUIO.
  2. Patch Cords and Modular Connectors:
    - a. Match horizontal cabling medium and rating. Same Manufacturer shall provide modular connectors and patch cords. Total patch cord length at work area is not to exceed 10 feet (3.0 m).
    - b. Copper Connectivity:
      - 1) Network Cabling System:
        - a) Provide for Work Area subsystem, including all modular connectors.
        - b) Modular connectors shall support of high-speed networks and applications designed for implementation on copper cabling.
        - c) Outlets shall utilize fully interchangeable and individual connector modules that mount side-by-side to facilitate quick and easy moves, adds and changes.
      - 2) Modular Connections:
        - a) Data Modules shall be Category 6:
          - (1) Eight position modules required in all work areas and shall exceed connector requirements of TIA Category 6 standard.
          - (2) Prove termination cap with strain relief on cable jacket, ensure cable twists are maintained to within 1/8 inch (3 mm) and include wiring scheme label. Wiring scheme label shall be available with TIA-568 wiring schemes.
        - b) Terminations shall use for TIA-568 wiring scheme.
        - c) Modules shall terminate 4 pair 23 100-ohm solid unshielded twisted pair cable.
        - d) Modules shall meet ISO 11801 standard including complying with intermateability standard IEC 60603-7 for backward compatibility.
        - e) Category 6 modules shall have UL and CSA approval.
        - f) Modules shall have ETL verified Category 6 performance and ISO 11801 Class E performance in both basic and channel links.
        - g) Modules shall be universal in design, accepting 2, 3, or 4 pair modular plugs without damage to outer jack contacts.
        - h) Modules shall be able to be re-terminated minimum of 10 times and be available in 11 standard colors for color-coding purposes.
        - i) Jack shall snap into all outlets and patch panels.
        - j) Module shall include black base to signify Category 6 400 MHz performance.
      - 3) Patch Cords:
        - a) Category 6 patch cords shall be factory terminated with modular plugs featuring one-piece, tangle-free latch design and strain-relief boots to support easy moves, adds, and changes.
        - b) Constructed with Category 6 23-AWG stranded UTP cable.
        - c) Each patch cord shall be one hundred (100) percent performance tested at factory in channel test to TIA Category 6 standard.

- 1) Vertical outlet poles and Surface Raceway refers to surface raceway system used for branch circuit wiring and/or data network, voice, video and other low-voltage cabling. Surface raceway shall be used in solid wall applications or for applications where moves, additions and changes are very typical to workflow.
  - b. Raceway system shall consist of raceway, appropriate fittings and accessories to complete installation per electrical Contract Documents. Non-metallic surface raceway is to be utilized in dry interior locations only as covered in Article 352, part B of the NEC, as adopted by the NFPA and as approved by the ANSI.
- E. Copper Termination Hardware:
1. Cables shall be dressed and terminated in accordance with TIA-568, Manufacturer's recommendations, and best industry practices.
  2. Pair untwist at termination shall not exceed 0.125 inch (3.175 mm).
    - a. Bend radius of cable in termination area shall not be less than 4 times outside diameter of cable.
  3. Cables shall be neatly bundled and dressed to their respective panels or blocks.
    - a. Each panel or block shall be fed by individual bundle separated and dressed back to point of cable entrance into rack or frame.
    - b. Cables shall be bundled using Velcro straps at least 0.25 inch (6.35 mm) wide. Use of plastic wire ties or zip ties is not allowed on project.
  4. Cable jacket shall be maintained as close as possible to termination point.
  5. Each cable shall be clearly labeled on cable jacket behind patch panel at location that can be viewed without removing bundle Velcro support straps.
    - a. Cables labeled within bundle, where label is obscured from view shall not be acceptable.
- F. Grounding System:
1. Where required, Telecommunications Bonding Backbone shall be designed and/or approved by qualified Installer.
  2. Follow requirements of TIA-607.
- G. Seismic Bracing:
1. Comply with IBC and local seismic requirements for all equipment and conduit pathways.
- H. Identification and Labeling:
1. Apply machine generated approved labeling for racks, cables, panels and outlets:
    - a. Designate cables origin and destination and unique identifier for cable by room name and/or number and port count.
    - b. Racks and patch panels shall be labeled to identify location within cable system infrastructure.
  2. Place labeling within view at termination point on each end.
  3. Outlet, patch panel and wiring block labels shall be installed on, or in, space provided on device.
  4. See Contract Drawings for labeling scheme.
  5. Conform to IP addressing assignments as listed in Attachment 'FACILITIES ZONE IP ADDRESS ASSIGNMENT TABLE'.
    - a. See Attachment 'FACILITIES ZONE IP ADDRESS ASSIGNMENT TABLE' for 'IP Address Assignments'.

### 3.2 FIELD QUALITY CONTROL

- A. Field Tests:
1. Provide testing upon completion of installation.
    - a. General:
      - 1) Testing to be in accordance with TIA standards and Manufacturer's system warranty guidelines and best industry practice.
        - a) If any of these are in conflict, discrepancies shall be brought to attention of Architect/Consulting Engineer for clarification and resolution.
    - b. Cables and termination hardware:
      - 1) Test complete system for defects in installation.

- 2) Verify cabling system performance under installed conditions according to requirements of TIA-568:
    - a) All pairs of each installed cable shall be verified prior to system acceptance.
    - b) Any defect in cabling system installation including but not limited to cable, connectors, feed through couplers, patch panels, and connector blocks shall be repaired or replaced in order to ensure one hundred (100) percent useable conductors in all cables installed.
  - c. Copper channel testing:
    - 1) All twisted-pair copper cable links shall be tested for compliance to requirements of TIA-568 for appropriate Category of cabling installed.
    - 2) Backbone multimode fiber cabling shall be tested at both 850 nm and 1300 nm.
  - d. UTP Cables and Links testing:
    - 1) UTP cabling channel must be tested at swept frequencies up to 250 MHz for internal channel performance parameters as defined in IEEE 802.3 and TIA-568. Certifications shall include following parameters for each pair of each cable installed:
      - a) Wire map (pin to pin connectivity).
      - b) Length (in feet or millimeters).
      - c) Near End Crosstalk (NEXT).
      - d) Far End Crosstalk (FEXT).
      - e) ELFEXT.
      - f) Attenuation/Crosstalk Ration (ACR).
      - g) Return Loss.
      - h) Propagation Delay.
      - i) Delay Skew.
      - j) Test equipment shall provide electronic and printed record of these tests.
    - 2) Test each pair of cable for opens, shorts, grounds, and pair reversal.
      - a) Correct short or grounded and reversed pairs.
      - b) Examine open and shorted pairs to determine if problem is caused by improper termination.
      - c) If termination is proper, tag bad pairs at both ends and note on termination sheets.
      - d) If horizontal cable contains bad conductors, remove and replace cable.
- B. Non-Conforming Work: Non-conforming work as covered in General Conditions applies, but is not limited to following:
1. Any cable damaged or exceeding recommended installation parameters during installation shall be replaced at no additional cost to Owner.
  2. Any defect in cabling system installation including but not limited to cable, connectors, feed through couplers, patch panels, and connector blocks shall be repaired or replaced in order to ensure one hundred (100) percent useable conductors in all cables installed at no additional cost to Owner.
  3. Correct deviation and repeat applicable testing at no additional cost to Owner.
  4. Correct any work found defective or not complying with Association Publications and TDMM requirements at no additional cost to Owner.
    - a. Document all problems found and corrective action taken.
    - b. Include both failed and passed test data.

**END OF SECTION**



**SECTION 27 5117****AUDIO SYSTEMS****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
  - 1. Furnish and install connections to existing sound system as described in Contract Documents including.
- B. Related Requirements:
  - 1. Division 26 'Electrical':
    - a. Power to equipment location and power relay wiring if applicable.
  - 2. Section 27 1501: 'Communications Horizontal Cabling'.

**1.2 REFERENCES**

- A. Association Publications:
  - 1. Building Industry Consulting Service International (BISCI):
    - a. *Information Transport Systems Installation Methods Manual (ITSIMM)* (5<sup>th</sup> Edition).
    - b. *Telecommunications Distribution Methods Manual (TDMM)* (12<sup>th</sup> Edition).
  - 2. InfoComm International Association:
    - a. *Audiovisual Best Practices: The Design & Integration Process for the AV and Construction Industries*.
    - b. *AV Design Reference Manual* (1st Edition, 2006).
    - c. *Basics of Audio and Visual Systems Design* (2003).
  - 3. Institute of Electrical and Electronics Engineers:
    - a. IEEE 1100-2005, '*Recommended Practice for Powering and Grounding Electric Equipment*'.
- B. Reference Standards:
  - 1. American National Standards Institute/InfoComm International Association:
    - a. ANSI/INFOCOMM 1M:2009, 'Audio Coverage Uniformity in Enclosed Listener Areas'.
    - b. ANSI/INFOCOMM 2M:2010, 'Standard Guide for Audiovisual Systems Design and Coordination Processes'.
    - c. ANSI/INFOCOMM 4:2012, 'Audiovisual Systems Energy Management'.
  - 2. National Fire Protection Association:
    - a. NFPA 70, 'National Electrical Code (NEC)' (2017 or most recent edition adopted by AHJ).
    - b. NFPA 72, 'National Fire Alarm and Signaling Code' (2019 or most recent edition adopted by AHJ).
  - 3. Telecommunications Industry Association:
    - a. TIA-568.2, 'Balanced Twisted-Pair Telecommunications Cabling and Components Standards' (Revision D, 2018).
    - b. TIA-569, 'Telecommunications Pathways And Spaces' (Revision D, 2015).
    - c. TIA-606, 'Administration Standard for Telecommunications Infrastructure' (Revision C, 2017).
    - d. TIA-607, 'Telecommunications Bonding and Grounding (Earthing) for Customer Premises' (Revision C, 2015).
    - e. TIA-758, 'Customer-Owned Outside Plant Telecommunication Infrastructure Standard' (Revision B, 2012).
  - 4. Underwriters Laboratories (UL):
    - a. UL 486A-486B, 'Wire Connectors' (3rd Edition April 2018).

### 1.3 QUALITY ASSURANCE

- A. Regulatory Agency Sustainability Approvals:
1. System shall be installed in accordance with applicable standards, requirements, and recommendations of International Building Code, National Electrical Code and all local authorities having jurisdiction.
- B. Qualifications:
1. Installer. Requirements of Section 01 4301 applies, but not limited to following:
    - a. Approved Installers:
      - 1) Installers are to furnish and install components of audio system and meet qualification requirements.
      - 2) Approval subject to agreement process for Pre-Approval Installers.
    - b. Alternate Installer(s):
      - 1) Firm specializing in performing work of this section:
        - a) Minimum three (3) years of successful installation experience of AV system projects of comparable size, and complexity required for this project. Audio systems must have included complete installation and setup work and must have been completed by factory trained and certified technician.
        - b) Firm successfully completed minimum of three (3) projects in past two (2) years before bidding.
        - c) Firms must have certified technician that has successfully completed all relevant training courses recommended by manufacturers and proficient of all specified equipment of this section.
        - d) Comply with specifications and Contract Documents.
      - 2) Submit documentation of compliance of qualifications before bid to Architect or Owner's Representative.
    - c. Same Approved Installer shall furnish and install components of Section 27 1116 'Communications Cabinets, Racks, Frames and Enclosures'.

### 1.4 DELIVERY, STORAGE, AND HANDLING

- A. Delivery And Acceptance Requirements:
1. Materials shall be delivered in original, unopened packages with labels intact.
- B. Storage And Handling Requirements:
1. Provide secure location protected from weather in cool, dry location, out of direct sunlight in compliance with Manufacturer's instructions and recommendations.
  2. Keep materials free from dirt and foreign matter.

### 1.5 WARRANTY

- A. Special Warranty:
1. Provide complete warranty repair or replacement for one (1) year at no cost to Owner, except in case of obvious abuse.

## PART 2 - PRODUCTS

### 2.1 SYSTEM

- A. Manufacturers Contact List:
1. Category Four components as shown on Drawings from following Manufacturers. See Section 01 6200 for definition of Categories.
    - a. Atlas Sound, Phoenix, AZ [www.atlassound.com](http://www.atlassound.com).
    - b. Audio-Technica US Inc, Stow, OH [www.audio-technica.com](http://www.audio-technica.com).
    - c. Belden Wire & Cable Co, Richmond, IN [www.belden.com](http://www.belden.com).

- d. BSS Audio, Sandy, UT [www.bssaudio.com](http://www.bssaudio.com).
- e. Chatsworth, Westlake Village, CA [www.chatsworth.com](http://www.chatsworth.com).
- f. Community Professional Loudspeakers, Chester, PA [www.communitypro.com](http://www.communitypro.com).
- g. COMTEK Inc, Salt Lake City, UT [www.comtek.com](http://www.comtek.com).
- h. Conquest Sound Co, Tinley Park, IL [www.conquestsound.com](http://www.conquestsound.com).
- i. Crown Audio Inc, Elkhart, IN [www.crownaudio.com](http://www.crownaudio.com).
- j. Countryman, Menlo Park, CA [www.countryman.com](http://www.countryman.com).
- k. EIKI International, Laguna Niguel, CA [www.eiki.com](http://www.eiki.com).
- l. Electro-Voice Inc, Burnsville, MN [www.electro-voice.com](http://www.electro-voice.com).
- m. Emtech Electronics Inc, Orem, UT [www.emtechelectronics.com](http://www.emtechelectronics.com).
- n. Extron, Anaheim, CA [www.extron.com](http://www.extron.com).
- o. HellermannTyton, Milwaukee, WI [www.hellermann.tyton.com](http://www.hellermann.tyton.com).
- p. Hubbell Inc, Orange, CT [www.hubbell-wiring.com](http://www.hubbell-wiring.com).
- q. IVIE Technologies Inc, Lehi, UT [www.ivie.com](http://www.ivie.com).
- r. JBL Professional, Northridge, CA [www.jblpro.com](http://www.jblpro.com).
- s. König & Meyer, Wertheim, Germany [www.k-m.de/en](http://www.k-m.de/en).
- t. Leviton Manufacturing Co, Little Neck, NY [www.leviton.com](http://www.leviton.com).
- u. Liberty AV Solutions, Colorado Springs, CO [www.libertycable.com](http://www.libertycable.com).
- v. Lowell Manufacturing Co, Pacific, MO [www.lowellmfg.com](http://www.lowellmfg.com).
- w. Middle Atlantic Products, Fairfield, NJ [www.middleatlantic.com](http://www.middleatlantic.com).
- x. Neutrik USA Inc, Lakewood, NJ (732) 901-9488. [www.neutrikusa.com](http://www.neutrikusa.com).
- y. Newark Electronics, Sola and Triad, Chicago, IL [www.newark.com](http://www.newark.com).
- z. QSC Audio Products, Costa Mesa, CA [www.qscaudio.com](http://www.qscaudio.com).
- aa. Radio Design Labs, Carpinteria, CA [www.rdl.net](http://www.rdl.net).
- bb. Rane Corp, Mukilteo, WA [www.rane.com](http://www.rane.com).
- cc. Shure Brothers, Evanston, IL [www.shure.com](http://www.shure.com).
- dd. SoundTech, Mundelein, IL [www.soundtech.com](http://www.soundtech.com).
- ee. Soundtube Entertainment, Park City, UT [www.soundtube.com](http://www.soundtube.com).
- ff. Surgex, Knightdale, NC [www.surgex.com](http://www.surgex.com).
- gg. Switchcraft, Chicago, IL [www.switchcraft.com](http://www.switchcraft.com).
- hh. TOA Electronics, South San Francisco, CA [www.toaelectronics.com](http://www.toaelectronics.com).
- ii. TV One, Erlanger, KY [www.tvone.com](http://www.tvone.com).
- jj. Whirlwind Music Distributors, Inc., Rochester, NY [www.whirlwindusa.com](http://www.whirlwindusa.com).
- kk. Wireworks Corp, Hillside, NJ [www.wireworks.com](http://www.wireworks.com).

## B. Performance:

### 1. Capabilities:

- a. Installations with audio DSP shall meet following performance parameters:
  - 1) From 100 Hz to 2 kHz, flat within plus or minus 2 dB.
  - 2) Above 2 kHz, slope down along an approximate 3 dB per octave slope to 8 kHz.
- b. No noise, hum, RFI pickup or distortion shall be audible under normal operating conditions.
- c. Audio systems shall reproduce program material at level of 80 to 85 dBA without audible distortion.
- d. All input levels shall be pre-set so system may be operated without going into feedback under normal conditions.

## PART 3 - EXECUTION

### 3.1 INSTALLERS

#### A. Approved Installers:

- 1. Category Four Approved Installers. See Section 01 6200 for definitions of Categories:
  - a. Qualifications:
    - 1) Meet qualification requirements as specified in Quality Assurance in Part 1 of this specification.
  - b. Custom Light & Sound: (919) 286-0011.
  - c. General Communications: (801) 266-5731.
  - d. Marshall Industries: (801) 266-2428.

- e. Poll Sound: (801) 261-2500.
- f. Professional Systems Technology: (801) 649-6696.
- g. Alternate Installer:
  - 1) Intermountain Media: 801 972 8830.

### 3.2 EXAMINATION

- A. Verification Of Conditions:
  - 1. Verify compliance with following items before beginning work of this Section:
    - a. No cables spliced.
    - b. Isolated ground run back to electrical panel from all equipment cabinets.
    - c. Specified conduit, cables, speaker enclosures and equipment cabinets are properly installed.
  - 2. Verify proper functionality for all system components being reused or remaining untouched.

### 3.3 INSTALLATION

- A. General:
  - 1. Install system in accordance with NFPA 70 'National Electrical Code', NFPA 72 'National Fire Alarm and Signaling', and other applicable codes. Install equipment in accordance with manufacturer's written instructions.
- B. Mounting And Securing Equipment:
  - 1. Equipment shall be firmly secured in place unless requirements of portability dictate otherwise.
  - 2. Fastenings and supports shall be adequate to support their loads with safety factor of at least three (3) times weight of equipment being installed.
  - 3. Any structural mounting that is not able to meet this requirement due to specific nature of equipment, manufacturer's requirements or limitations of facility, shall not be installed without prior approval of Engineer.
  - 4. Install all boxes, equipment, hardware, and other materials plumb, level, and square.
- C. Millwork:
  - 1. Install technology equipment and support equipment in podium and other millwork in neat and cosmetically dressed out manner.
  - 2. Saw cuts, holes and recesses into laminates and woodwork shall be straight.
  - 3. Radius and circular cuts shall be consistent, and all uneven surfaces shall be corrected. This shall include use of moldings, grommets, bushings, laminates, and wood products as required to dress out installation of equipment.
  - 4. Install equipment and panels in technology racks and podiums using matching screws, hardware and grommets.
- D. Cables, Wires, And Connectors:
  - 1. Cables:
    - a. Cable and wire shall be new and unspliced.
    - b. Splicing:
      - 1) Splicing of cables and conductors is expressly prohibited in any location other than equipment racks.
      - 2) Splicing of control and speaker level conductors shall be accomplished via punch block or terminal strip connections only.
    - c. Additional cable length shall be provided at all connector locations. Duplex box, junction box, and floor box locations shall be installed with sufficient cable length behind cover plates to permit wiring maintenance and connector replacement in the future.
    - d. When cable runs utilize vertical cable raceways located within walls, acoustic integrity of walls shall be maintained:
      - 1) Cables that pass-through cover plates of junction boxes and raceways, through slab-to-slab walls, and through conduit lines shall be properly gasketed and sealed. Acoustic material shall be restored or replaced.
  - e. Separation between system cables and other services shall be maximized to prevent and/or minimize potential for electro-magnetic interference (EMI):

- 1) Provide at least 12 inches (305 mm) separation from electrical lines whenever feasible.
  - 2) Where separation is unavoidable, distribution cables shall cross other services at right angles whenever practical to minimize EMI.
  - f. Do not install signal cables on top of light fixtures, ceiling speakers, projection screens, HVAC controls or sensing devices, fire safety and sprinkler system detection technology, or any other technology or mechanical equipment.
  - g. Install system cables shall not block access to other equipment or services, across removable service panels and/or in any other manner to prohibit routine maintenance of HVAC systems, fire safety equipment and building mechanical control systems.
  - h. Inter-rack cabling:
    - 1) Inter-rack cabling shall be neatly laced, dressed, strain relieved and adequately supported.
    - 2) Inter-rack cables shall be grouped according to signals being carried to reduce signal contamination. Separate groups shall be formed for following:
      - a) Power.
      - b) Control.
      - c) Video.
      - d) Audio cables carrying signals less than -20 dBm.
      - e) Audio cables carrying signals between -20 dBm and +20 dBm.
      - f) Audio cables carrying signals over +20 dBm.
  - i. Power cables, control cables, and high-level cables shall be run on left side of equipment racks as viewed from rear. All other cables shall be run on right side of all equipment racks as viewed from rear.
  - j. Cables, except video cables which must be cut to electrical length, shall be cut to length dictated by cable run.
  - k. Terminal blocks, boards, strips or connectors, shall be furnished by installer for all cables which interface with racks, cabinets, consoles, or equipment modules. Affix terminal blocks, boards, strips or connectors to equipment racks using screws only. Double sided tape will not be accepted.
  - l. Shields for audio cables shall be grounded at input end only of various equipment items on system to prevent potential for ground loops.
  - m. Shields for microphone cables shall be grounded at both ends to allow Phantom Power to pass.
2. Wiring and Cabling:
- a. Comply with industry standard circuit polarity and loudspeaker wiring polarity. No cables shall be terminated with polarity reversal between connectors at either end.
  - b. System wire, after being cut and stripped, shall have wire strands twisted back to their original lay and be terminated by approved soldered or mechanical means. No bare wire ends shall be accepted.
  - c. Do not place any wires and cables for this system in any conduit, raceway, wire way or cable tray that is used for mechanical systems of building.
  - d. Route all cable and wiring within equipment racks, cabinets and millwork according to function, separating wires of different signal levels (microphone, line level, amplifier output, AV, control, etc.) by as much distance as possible. Neatly arrange, harness and bundle all cable with velcro straps.
  - e. After completion of wiring and cable installation, all trough and box covers shall be notched out and grommetted for clearance of various cable bundles, (i.e., separate audio, video, and control). Panel covers shall be screwed back in place and all gaskets shall be restored or replaced.
3. Connectors:
- a. Provide connectors of type and quality as detailed in Contract Drawings and/or as required to meet minimum bandwidth requirements of equipment to which connectors are terminated. Overall quantity of connectors shall not be limited by quantities indicated in Contract Drawings and shall be provided as required.
  - b. No connectors shall be installed in non-accessible locations or used for splicing cables. Connectors shall be new.
  - c. Connectors shall incorporate strain relief mechanisms which firmly grip the jacket of connected cables.
  - d. Connectors shall be properly polarized to prevent improper seating.

- e. Connectors shall provide appropriate electrical characteristics for circuitry to which they are attached.
  - f. Exposed conductors inside of equipment racks shall be dressed with heavy duty neoprene heat-shrink tubing.
  - g. Heat-shrink type tubing shall be used to insulate and dress ends of all wire and cables including separate tube for ground or drain wire.
  - h. Solder connections shall be made with rosin-core solder. Temperature controlled soldering irons rated at least 60 watts shall be used for all soldering work. No soldering guns, gas or butane, or temperature unregulated irons shall be used on job site.
  - i. Mechanical connections shall be made with approved crimp lugs of correct size and type for connection. Wire nuts shall not be permitted except inside speaker enclosures. Each connector shall be attached with proper size controlled-duty-cycle ratcheting crimp tool approved by manufacturer.
  - j. Conventional non-ratcheting type crimping tools are unacceptable, and shall not be used on job site. Presence of such tools on job site shall constitute evidence of mechanical connections made with unauthorized tools and shall provide sufficient grounds for rejection of all mechanical connections in system, and will be considered non-conforming work.
- E. Identification And Labeling:
1. Cables, regardless of length, shall be identified with machine-printed wrap-around labeling system at both ends:
    - a. These labels shall be self-laminating to ensure durability.
    - b. Label format used shall be equal, or better than, system detailed.
  2. There shall be no unmarked cables any place in system.
  3. Marking codes used on cables shall correspond to codes provided with submittals, and/or written documentation of 'Record Drawings'.
  4. Connectors, controls, equipment components, terminal blocks and equipment racks are to be permanently labeled in format approved during submittal process.
  5. Equipment labels are to be permanently engraved in metal. Alternative method shall be approved during submittal process only.
  6. Clearly and permanently label all jacks, controls, connections, and so forth. Embossed or printed label tape shall not be used and is considered unacceptable for this system. Attach labels with double stick tape as required.
  7. Labeling shall be completed prior to acceptance of final system.
- F. Grounding:
1. Provide equipment grounding connections for audio system as indicated. Tighten connections to comply with tightening torques specified in UL Standard 486A-486B to assure permanent and effective grounds.
  2. Ground equipment, conductor, and cable shields to eliminate shock hazard and to eliminate ground loops, common mode returns, noise pickup, cross talk, and other impairments. Provide 5 ohm ground at main equipment location. Measure, record, and report ground resistance.
  3. Provide grounding conductor with green insulation between as indicated on Contract Drawings. Comply with IEEE and TIA standards.
- G. Seismic Bracing:
1. Comply with IBC and local seismic requirements for all equipment and conduit pathways.

### 3.4 FIELD QUALITY CONTROL

- A. Field Inspections:
- B. Non-Conforming Work:
1. Correct any work found defective or not complying with contract document requirements at no additional cost to the Owner.

### **3.5 CLEANING**

#### **A. Waste Management:**

1. All work areas are to be kept clean, clear and free of debris at all times.
2. Disposal of rubbish, debris, and packaging materials in proper manner.

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