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PART 1 GENERAL

1.01 EXISTING CONDITIONS

   1. Original copy is available for inspection at Owner’s offices during normal business hours.
   2. This report identifies properties of below grade conditions and offers recommendations for the design of foundations, prepared primarily for the use of Architect.
   3. The recommendations described shall not be construed as a requirement of this Contract, unless specifically referenced in the Contract Documents.
   4. This report, by its nature, cannot reveal all conditions that exist on the site. Should subsurface conditions be found to vary substantially from this report, changes in the design and construction of foundations will be made, with resulting credits or expenditures to the Contract Price accruing to Owner.

   1. Original copy is available for inspection at Owner’s offices during normal business hours.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION
1.01 SECTION INCLUDES
A. Summary of the Work.
B. Work by Owner.
C. Owner's occupancy.
D. Contractor's use of site and general limitations.
E. Definitions used throughout the Specification and Drawings.
F. Specification formats and conventions.

1.02 PROJECT
A. Project Name: Erb Memorial Union, Craft Center.
B. Owner's Name: University of Oregon.
C. The Project consists of the demolition, alteration and new construction of the Erb Memorial Union Craft Center.
D. The Project is registered with the US Green Building Council's LEED Green Building Rating System. The Owner's goal and the Contractor's responsibilities for LEED are summarized in Section 01 35 15 - LEED Requirements. Contractor's LEED responsibilities are part of the Work.

1.03 CONTRACT DESCRIPTION
A. Contract Type: A single prime contract based on a Stipulated Price as described in the Agreement.
B. Permit fee with the City of Eugene will be paid for by The University of Oregon.

1.04 DESCRIPTION OF ALTERATIONS WORK
A. Scope of demolition and removal work is shown on drawings and specified in Section 02 41 00.

1.05 WORK BY OWNER
A. Items noted FOIO (Furnished by Owner Installed by Owner) will be furnished and installed by Owner before Substantial Completion. Some items include:
1. Furnishings.
2. Small equipment.
3. Artwork.
B. Owner will supply the following for installation by Contractor:
1. Room numbering; See Appendix – Room Numbering Guide
2. Specification of and providing of door hardware; OFCI.
3. Exterior trash cans. Custom UO design and order, OFOI.
4. Exterior benches; OFCI.
5. Toilet dispenser accessories; OFCI.
6. Exterior light poles, globes, lamps, and junction box; OFCI.
7. Interior signage on small to medium projects only; OFOI.
8. Exterior building marker signage; OFOI.
9. Wall clocks; OFCI.
10. Waste receptacles for all spaces; OFOI.
11. Ash posts or smoking stations. OFOI; Custom UO fabrication.
12. Walk off mats; OFOI.
C. Third party entities hired by the Owner may include, but are not limited to, the following:
1. Cost estimator.
2. Site survey.
3. Certified arborist services.
4. Special inspections and testing services (See Section 01 40 00).
5. Water and air balancing and testing services.
6. Commissioning services.
7. Energy analyst.
8. Geotechnical consultant.
9. Hazardous materials testing and monitoring.
10. Asbestos removal.

1.06 OWNER OCCUPANCY
A. Owner intends to occupy the Project upon Substantial Completion.
B. Cooperate with Owner to minimize conflict and to facilitate Owner’s operations.
C. Schedule the Work to accommodate Owner occupancy.

1.07 CONTRACTOR USE OF SITE AND PREMISES
A. Construction Operations: Limited to areas noted on Drawings.
B. No Smoking Policy: Smoking is prohibited in Project Site.
C. Provide access to and from site as required by law and by Owner:
   1. Emergency Building Exits During Construction: Keep all exits required by code open during construction period; provide temporary exit signs if exit routes are temporarily altered.
   2. Do not obstruct roadways, sidewalks, or other public ways without permit.
   3. Unless written approval is obtained, construction must not obstruct private or public streets, driveways, pedestrian walkways, ADA routes, fire lanes, egress of occupied buildings, etc.
   4. Coordinate construction detour routes for bikes, pedestrians, vehicles, etc. with FS Exterior Supervisor, PP, PM, and as needed DPS.
D. No disposal or recycling on university property outside construction area(s) unless approved by PM.
E. No burying of any demolition or construction materials on site.
F. No stockpiling of waste on-site beyond the period necessary for sorting and accumulation of practical quantities for transport off-site.
G. Description of Work times may be limited beyond requirements set by city codes.
H. In the event the Contractor encounters material that is believed to be hazardous, asbestos containing, coated with lead base paint, and/or oily debris the Contractor shall immediately stop work in the affected area and report the condition to the PM. At no time shall such material be disturbed, handled or disposed of by the Contractor. The Contractor will cooperate and work with the PM, EH&S, any Consultants, and abatement Contractors engaged by the Owner.
I. Protection of existing conditions:
   1. Provide necessary measures required to fully protect existing conditions.
   2. Restore permanent facilities used during construction to their specified and/or original condition.
J. When required, provide scaffolding erected by a certified erector following OSHA guidelines.
K. Reference Section 00 31 00 – Available Project Information, for information on known asbestos containing materials and locations to be provided protection to prevent disturbance.

1.08 DELEGATED DESIGN REQUIREMENTS
A. General requirements for Delegated Design components are specified in Section 01 33 16.
B. Specific design requirements are specified in Sections of Division 02 through 50.
C. Delegated design may sometimes also be referred to as "Design-Build." Both terms may be used interchangeably and have the same meaning.

1.09 DEFINITIONS
A. Basic Contract definitions are included in the Conditions of the Contract.

2. Basic contract definitions that are not defined in the General Conditions shall have the same meaning as defined in AIA Document A201 – 1997.

B. "AHJ": Authority Having Jurisdiction as defined in AIA Document A201.

C. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.

D. "Delegated Design": Professional design service or certification specifically required of the Contractor in the Specifications. Such work is subject to provisions of AIA Document A201 § 3.12.10. The terms "Delegated Design," and "Design-Build," mean the same thing and are used interchangeably.

E. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "approved," "required," and "permitted" have the same meaning as "directed."

F. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."

G. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.

H. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.

I. "Install": Operations at Project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations, complete and ready for the intended use.

J. "Provide": Furnish and install, complete and ready for the intended use.

K. "Project Site": Space available for performing construction activities. The extent of Project site is shown in Drawings and may or may not be identical with the description of the land on which Project is to be built.

L. "Work": Project material "furnished" and "installed" complete and ready for the intended use.

1.10 SPECIFICATION FORMATS AND CONVENTIONS

A. Specification Format: The Specifications are organized into Divisions and Sections using the CSI/CSC's MasterFormat 50-Division numbering system.

B. Sections in Division 01 govern the execution of the Work of all Sections in the Specifications and Drawings.

C. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:

1. Abbreviated Language: Language used in the Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be inferred as the sense requires. Singular words shall be interpreted as plural, and plural words shall be interpreted as singular where applicable as the context of the Contract Documents indicates.

2. Imperative mood and streamlined language are generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by Contractor. Occasionally, the indicative or subjunctive mood may be used in the Section Text for clarity to describe responsibilities that must be fulfilled indirectly by Contractor or by others when so noted.
3. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.

PART 2 PRODUCTS - NOT USED
PART 3 EXECUTION - NOT USED

END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES
A. Procedures for preparation and submittal of applications for progress payments.
B. Contract modification procedures.
C. Additional architectural service for extraordinary contract administration.
D. Procedures for preparation and submittal of application for final payment.

1.02 DEFINITIONS
A. Architectural Bulletin (AB): Architect's form issued by Architect indicating "Architect's Supplemental Instruction" or "Proposal Request" or "Construction Change Directive" or as a signature cover to Contractor initiated proposal.
   1. AB Form is enclosed at end of Section.
C. Proposal Request (PR): A formal request from Architect to Contractor for change in Contract Sum and Time required to perform a proposed change in Work. Proposal Request is not a directive to perform the proposed change.
D. "Construction Change Directive" and "Change Order" have meanings defined in AIA Document A201.
E. Additional Contract Administration Services: Architectural service to enforce Contract Documents resulting from Contractor's failure to comply with requirements or Contractor's request for accelerated procedures.

1.03 SCHEDULE OF VALUES
A. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit sample to Architect for approval.
B. Forms filled out by hand will not be accepted.
C. Submit a printed schedule on AIA Form G703 - Application and Certificate for Payment Continuation Sheet. Contractor's standard form or electronic media printout will be considered.
D. Submit Schedule of Values in duplicate within 15 days after date of Owner-Contractor Agreement.
E. Format: Utilize the Table of Contents of this Project Manual. Identify each line item with number and title of the specification Section. Identify site mobilization.
F. Include separately from each line item, a direct proportional amount of Contractor's overhead and profit.
G. Revise schedule to list approved Change Orders, with each Application For Payment.
H. See 1.4 Applications for Progress Payments for additional requirements.

1.04 APPLICATIONS FOR PROGRESS PAYMENTS
A. Payment Period: Submit at intervals stipulated in the Agreement.
B. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit sample to Architect for approval.
C. Forms filled out by hand will not be accepted.
D. Present required information in typewritten form.
E. Form: AIA G702 Application and Certificate for Payment and AIA G703 - Continuation Sheet including continuation sheets when required.
F. Procedures for preparation and submittal of applications for progress payments in addition to those stated in the General Conditions and General Requirements also include:
   1. LEED project submittal summary is to be included with each payment application before application can be processed. Additionally, one half of one percent from each payment
PRICE AND PAYMENT PROCEDURES

application will be allocated and held until released upon approval of the final LEED submittal.
2. One half of one percent from each payment application will be allocated and held until released upon approval of the final Operation and Maintenance Manual submittal. The Contractor shall submit a draft Operation and Maintenance Manual to the Architect upon 75 percent project completion.
3. One half of one percent from each payment application will be allocated and held until released upon approval of the final Record Document submittal.
4. One half of one percent from each payment application will be allocated and held until released upon approval of the final Commissioning submittal.
5. The above items, where applicable, will be listed as separate line items on the Contractor's schedule of values.

G. Changes in the work shall be initiated using the SERA Architectural Bulletin (AB) Form.

H. Additional contract administration services is an additional architectural service and will be billed to the Owner who will then back-charge the Contractor.

I. Execute certification by notarized signature of authorized officer.

J. Use data from approved Schedule of Values. Provide dollar value in each column for each line item for portion of work performed and for stored Products.

K. List each authorized Change Order as a separate line item, listing Change Order number and dollar amount as for an original item of Work.

L. Submit three copies of each Application for Payment.

M. Include the following with the application:
   1. Construction progress schedule, revised and current as specified in Section 01 30 00.
   2. Current construction photographs specified in Section 01 30 00.
   3. LEED submittals applicable to work for which application is being made; see Section 01 35 16.
   4. Project Record Documents as specified in Section 01 78 00, for review by Owner which will be returned to the Contractor.
   5. Preliminary Closeout Documents when specified in Section 01 78 00.
   6. Affidavits attesting to off-site stored products.
   7. Contractor payment requests must be accompanied by all wage certificates for the billing period.

N. Materials stored off site and included in the schedule of values for monthly payment application are to be stored in a bonded and secure facility. Copies of bill of sale for materials and certificate of insurance for material with Owner named as an insured are to be included with the payment application.

O. When Architect requires substantiating information, submit data justifying dollar amounts in question. Provide one copy of data with cover letter for each copy of submittal. Show application number and date, and line item by number and description.

1.05 MODIFICATION PROCEDURES

A. For minor changes not involving an adjustment to the Contract Price or Contract Time, Architect will issue instructions directly to Contractor.

B. Architect will advise of minor changes in the Work not involving an adjustment to Contract Sum or Contract Time as authorized by the Conditions of the Contract by issuing supplemental instructions on Architectural Bulletin Form.

C. Construction Change Directive: Architect may issue an AB, signed by Owner, instructing Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
   1. The document will describe the required changes and will designate method of determining any change in Contract Sum or Contract Time.
   2. Promptly execute the change.
D. Proposal Request: Architect may issue an AB which includes a detailed description of a proposed change with supplementary or revised Drawings and Specifications, a change in Contract Time for executing the change and the period of time during which the requested price will be considered valid. Contractor shall prepare and submit a fixed price quotation within 15 days.

E. Contractor may propose a change by submitting a request for change to Architect, describing the proposed change and its full effect on the Work, with a statement describing the reason for the change, and the effect on the Contract Sum and Contract Time with full documentation. Document any requested substitutions in accordance with Section 01 60 00. Contractor proposal will be processed in one of the following methods:
   1. Architect may reject Contractor proposal or may return it for modification.
   2. Architect may attach Contractor proposal to SERA AB, complete the AB appropriately, and distribute it for signatures.
   3. Architect may accept Contractor's form that has place for signatures, sign it and distribute to Owner for signature.

F. Computation of Change in Contract Amount: As specified in the Agreement and Conditions of the Contract.
   1. For pre-determined unit prices and quantities, the amount shall be based on the fixed unit prices.

G. Substantiation and Computation of Costs: Provide complete itemized cost information with substantiating backup for each item for evaluation as follows:
   1. Quantities of products, labor, and equipment.
   2. Taxes, insurance, and bonds.
   3. Overhead and profit on products and labor only. Overhead and profit is limited as follows:
      a. Upper tier contractor: 5%
   5. Credit for deletions from Contract, similarly documented.
   6. For Time and Material work, submit itemized account and supporting data after completion of change, within time limits indicated in the Conditions of the Contract.

H. Execution of Change Orders: Architect will issue Change Orders for signatures of parties as provided in the Conditions of the Contract.

I. After execution of Change Order, promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as a separate line item and adjust the Contract Sum.

J. Promptly enter changes in Project Record Documents.

1.06 EXTRAORDINARY CONTRACT ADMINISTRATION SERVICE

A. Owner-Architect Agreement identifies certain additional services for which Architect may receive additional compensation. Some of these services may result out of actions or non-actions by Contractor; these include, but are not limited to:
   1. Design services for modification resulting from substitution proposed by Contractor.
   2. Review of submittals after the first re-submittal.
   3. Review or response to unnecessary or frivolous RFI.
   4. Second notification and review of non-compliant work.
   5. Design services to correct or incorporate non-compliant work.
   6. Design or engineering specified as Contractor's responsibility; for example, for design-build component or for performance-specified work.
   7. Performing administrative work specified as Contractor's responsibility when Contractor refuses to perform after notification.
   8. Performing administrative work specified as Contractor's responsibility when requested to expedite the Work.
9. Providing extra construction administration services after the specified date of Substantial Completion or the specified date of Final Completion when delay is not caused by Owner.
10. Re-inspection for Substantial Completion or Final Completion.

B. Architect will issue Notice for Extraordinary Contract Administration Services to Owner and a copy to Contractor. Thereafter, Architect will record time and expense for each occurrence, or in the case of recurring occurrences, each type of occurrence.
   1. Architect will, at their discretion, invoice Owner monthly for additional services.
   2. Architect’s fee schedule for additional services is included in Owner-Architect Agreement, and is available to Contractor upon request.

C. Owner reserves the right to charge the cost of Architect’s extraordinary contract administration service plus 10% administration cost to Contractor in an AB.

1.07 APPLICATION FOR FINAL PAYMENT

A. Prepare Application for Final Payment as specified for progress payments, identifying total adjusted Contract Sum, previous payments, and sum remaining due.

B. Application for Final Payment will not be considered until the following have been accomplished:
   1. All closeout procedures specified in Section 01 70 00. Prior to any final payment(s) all required as-built and O&M documentation as listed in Section 01 70 00 must be received by Owner.
   2. Affidavit that payrolls and bills have been satisfied.
   3. Consent of Surety to make Final Payment.
   4. Certificate evidencing that Builder’s Risk Insurance required after Substantial Completion will remain in force, and a written statement that Contractor knows of no reason that insurance will not be renewed for the required period until Final Payment.
   5. Prior to any final payment(s) all keys checked out to Contractor(s) and/or Consultant(s) must be returned to DPS and a receipt of return provided to PM by DPS.

END OF SECTION
The following instruction is hereby issued:

**ARCHITECT’S SUPPLEMENTAL INSTRUCTION** (complete PART A only)

The Work shall be carried out in accordance with the following supplemental instructions issued in accordance with the Contract Documents without change in Contract Sum or Contract Time. Proceeding with the Work in accordance with these instructions indicates the Contractors acknowledgement that there will be no change in the Contract Sum or Contract Time.

**PROPOSAL REQUEST** (complete PART A only)

Please submit an itemized quotation for changes to the Contract Sum and/or Contract Time incidental to the proposed modifications of the Contract Documents described below. DO NOT PROCEED WITH WORK UNTIL RECEIVING FURTHER WRITTEN INSTRUCTION This is not a change order, a construction change directive or a direction to proceed with the work described herein.

**CONSTRUCTION CHANGE DIRECTIVE** (complete PARTS A & B)

You are hereby directed to make the following change(s) in this Contract. Track the costs of changes to the Contract as described in proposed adjustments (Part B) below.

**PART A: DESCRIPTION OF WORK**

X.1 **(DISPOSITION)**

(Description – describe work scope in this space – text to be Title Case and not bold. Column to left, i.e. “disposition” to denote type of change using on the following works (or iterations), “ADD”, “DELETE”, “CLARIFY”, or “CHANGE”. Disposition text to be ALL CAPS and bold.)

**ATTACHMENTS**

**Issued by:** SERA Architects, Inc.

**PART B: PROPOSED ADJUSTMENTS**

1. The proposed basis of adjustment to the Contract Sum or Guaranteed Maximum Price is:
   - Unit Price of $ per
   - Lump Sum (increase) (decrease) of $ 
   As provided in Subparagraph 7.3.3 of AIA Document A201 1997 Edition
   As follows:

2. The Contract Time is proposed to:
   - Remain unchanged
   - Be adjusted with an (increase) (decrease) of days
PART 1 - GENERAL

1.01 SUMMARY
A. Section includes procedure for coordinating and submitting Request for Interpretation.

1.02 DEFINITIONS
A. RFI: Request from Contractor to Architect seeking interpretation or clarification of the Contract Documents.

1.03 RFI PROCEDURE
A. Review Contract Documents and Project Site in a thorough and timely manner so Architect will have sufficient time to respond to RFI prior to execution of subject construction.
   1. Claim for additional Time or Cost when RFI is answered within time limit specified in this Section will be rejected.
B. Immediately on discovery of the need for interpretation of the Contract Documents, and if not possible to request interpretation at Project meeting, prepare and submit an RFI in the form specified.
   1. RFIs shall originate with Contractor. RFIs submitted by entities other than Contractor will be returned with no response.
   2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.
C. When possible, request interpretation at next Progress Meeting. Record Architect's response in meeting minutes.
   1. When response is not given during meeting, submit RFI in approved format.

1.04 SUBMITTALS
A. RFI Form: Electronic form furnished by Architect, numbered and signed by Contractor.
   1. Number each page of attachments with RFI number in lower right corner.
   2. Attachments shall be electronic files in Adobe Acrobat PDF format.
   3. Alternative RFI Form: Subject to Architect’s approval, Contractor software-generated form modified to match Architect’s form. Numbering and attachments as specified in this Section.
B. RFI Content: Include detailed, legible description of item needing interpretation and the following:
   1. Project name and number.
   2. Date.
   3. Name of Contractor.
   5. RFI number, numbered sequentially. Add revision numbers as decimal and digit.
   6. RFI subject title, less than five words
   7. Initiator of question
   8. Specification Section number and title and related paragraphs, as appropriate.
   9. Drawing number and detail references, as appropriate.
   10. Field dimensions and conditions, as appropriate.
   11. Contractor's suggested solution(s). If Contractor's solution(s) impact the Contract Time or the Contract Sum, Contractor shall state anticipated impact in the RFI.
   12. Contractor's signature.
   13. Attachments: Include drawings, descriptions, measurements, photos, Product Data, Shop Drawings, and other information necessary to fully describe items needing interpretation.
      a. Supplementary drawings prepared by Contractor shall include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments.
   14. Single discipline per RFI: Architectural, Civil, Structural, Mechanical or Electrical
   15. Space for reply on same page, if possible.
C. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log weekly. Use CSI Log Form 13.2B or approved form. Include the following:
   1. Project name.
   2. Name and address of Contractor.
   3. Name and address of Architect.
   4. RFI number including RFIs that were dropped and not submitted.
   5. RFI description.
   6. Date the RFI was submitted.
   7. Date Architect's response was received.
   8. Identification of related Minor Change in the Work, Instrument of Change, Construction Change Directive, or Proposal Request, as appropriate.

1.05 ARCHITECT’S ACTION

A. Architect will review each RFI, determine action required, and return it. Allow 14 days for Architect's response for each RFI; and additional 7 days for consultant review. RFIs received after 1:00 p.m. will be considered as received the following working day.
   1. Failure to allow specified response time will not be cause for an extension of Contract Time or additional cost.
   2. Architect's goal will be to return RFI as quickly as possible. However, quick response is not guaranteed.
   3. The following RFIs are defined as frivolous and will be returned without action:
      a. Requests for approval of submittals.
      b. Requests for approval of substitutions.
      c. Requests for information already indicated in the Contract Documents.
      d. Requests for information derived from activities assigned to Contractor in the Contract Documents.
      e. Requests for approval of adjustments in the Contract Time or the Contract Sum.
      f. Requests for interpretation of Architect's actions on submittals.
      g. Incomplete RFIs or RFIs with numerous errors.
      h. Questions relating to construction means, methods, techniques, sequences, procedures or safety precautions. (These are Contractor’s responsibility exclusively.)
      i. Questions relating to construction schedule, coordination between trades, or division of work among subcontractors. (These are also Contractor’s responsibility exclusively.)
   4. Architect's action may include a request for additional information, in which case Architect's time for response will start again.
   5. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Contract Modification Procedures.
      a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect in writing within 10 days of receipt of the RFI response.
      b. Do not proceed with this work until Change Order is executed.

B. On receipt of Architect's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect within 5 days if Contractor disagrees with response.

C. Frivolous RFI: Architect may claim compensation for cost of Architect’s time and materials as a result of unnecessary or frivolous RFIs. Compensation will be assessed to Contractor in accordance with Section 01 20 00 - Price and Payment Procedures.

1.06 QUALITY ASSURANCE

A. Contractor shall strive to keep the number of RFIs to a minimum.
   1. Prior to submitting RFI, carefully study Contract Documents to assure that requested information is not already available. RFIs that request information available in the Contract Documents will be considered frivolous.
B. RFI is not a substitute for Shop Drawing. When multiple RFIs are submitted for related work, Architect may require a Shop Drawing.

C. RFI submitted by Fax is not acceptable.

END OF SECTION
Request for Interpretation

Project Name: 
Project Number: Request for Interpretation No.: 
Owner: Date Issued: 
Attention: Time: 
Owner Contract No. (if any): Contractor: 

No. (if any):
The Work shall be carried out in accordance with the following supplemental instructions issued in accordance with the Contract Documents without change in Contract Sum or Contract Time. Proceeding with the Work in accordance with these instructions indicates your acknowledgement that there will be no change in the Contract Sum or Contract Time.

Description:
Specification Section: 
Drawing Title: Sheet #: Reference: 
Paragraph: Article: 
Request: 

Requested By: Initiating Sub. (if app.): 
Title: Request Reply By: 

Architect/Consultant Response: 
Accepted: Accepted as Noted: Not Accepted: 
Response: 

BY: Date: 

Attachments: 
☑ Owner ☐ Consultant ☐ Contractor ☐ Other 
☒ Architect ☐ Consultant ☐ Field ☐ Other 
☐ Other
PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Project coordination.
   B. Communication with Architect.
   C. Coordination Drawings.
   D. Pre-construction meeting.
   E. Progress meetings.
   F. Pre-installation meetings.

1.02 SUBMITTAL PROCEDURES
   A. Specified in Section 01 33 00 - Submittal Procedures

1.03 SUBMITTALS
   A. Construction Submittal Requirements:
   B. PM shall receive a minimum of one stamped original of all submittals at the time of Consultant approval.
   C. PM will provide the A/E and GC with a list of submittal items that require concurrent FS Maintenance & PM review and approval prior to official submittal acceptance. This list consists of, but is not limited to the following items:
      1. Variable Frequency Drives, VFD
      2. AHU and motor-mounts
      3. Transformers
      4. Building controls
      5. Soils
      6. Light Fixtures
      7. Backflow devices
      8. Fire Alarm systems
      9. Fire sprinkler components
   D. Pre-Construction Meeting Submittals: Bonds, insurance, schedule of values, project personnel directory, subcontractor and supplier list, and other lists; specified in other Sections.
   E. Key Personnel Names: Within 15 days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home and office telephone numbers. Provide names, addresses, and telephone numbers of individuals assigned as standbys in the absence of individuals assigned to Project.
      1. Post copies of list in Project meeting room, in temporary field office, and by each temporary telephone. Keep list current at all times.
   F. Minutes of meetings required in this Section.
   G. Coordinated Ceiling Drawings: Submit within 60 days of Notice to Proceed. Submit 1 set of color plots or color copies on white bond paper. Transmit CADD files.
      1. Architect will review, stamp and return one copy with comments within 14 days after receipt. Procedure requirements for Shop Drawings in Section 01 33 00 apply.
      2. Architect's review is for compliance with design intent and does not relieve Contractor of coordination and performance requirements.
      3. Copy reviewed drawings and distribute to appropriate entities.

1.04 PROJECT COORDINATION
   A. Coordinate construction operations specified in different Sections to ensure efficient and orderly installation of each part of the Work. Coordinate portions of work that depend on each other for proper installation, connection, and operation.
ADMINISTRATIVE REQUIREMENTS

B. In the event of an inconsistency in the Drawings or between the Drawings and the Specifications, unless otherwise ordered in writing by the Architect, the Contractor shall provide the greater quantity and/or better quality of work.

C. Coordination Drawings: Prepare Coordination Drawings if limited space availability necessitates maximum utilization of space for efficient installation of different components or if coordination is required for installation of products and materials fabricated by separate entities.
   1. Content: Project-specific information, drawn accurately to scale. Do not base Coordination Drawings on reproductions of the Contract Documents or standard printed data. Include the following information, as applicable:
      a. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
      b. Indicate required installation sequences.
      c. Indicate dimensions shown on the Contract Drawings and make specific note of dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternate sketches to Architect for resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.
   2. Sheet Size: At least 8-1/2 by 11 inches but no larger than Project Drawings.
   3. Media: CADD electronic "dwg" files unless other media is approved by Architect.

1.05 DIGITAL COMMUNICATION

A. Communication to Architect: High speed internet based digital, except Submittals specified in Section 01 33 00.
   1. Telephone communication is acceptable for initial or simple issues.
   2. Follow up telephone communication in writing.

B. Construction Office Equipment:
   1. High speed internet connection equipment and service.
      a. Email Attachment Capacity: Not less than 10 megabytes.
   2. Computer with internet connection and project management software:
      c. Project scheduling software.
   3. Scanner, not less than 150 dpi.
   4. Copy machine not less than 400 dpi with capability for 11 x17 and color.
   5. Telephone with conference call capability
   6. Digital camera, 3.5 megapixel minimum.

C. Correspondence:
   1. correspondence by FAX is not acceptable unless specifically approved.
   2. Any information that is disseminated shall retain the original scale and aspect from the original as published by Architect.

1.06 COORDINATED CEILING DRAWINGS

A. Content and View: Two views, concealed conditions and visually exposed conditions, shown as reflected plans. Indicate actual size of components at scale sufficient to show no interference and adequate space for installation and maintenance of each component.
   1. Concealed Conditions View: Including, but not limited to: mechanical systems (plumbing, ductwork, HVAC Equipment, piping, controls, fire protection systems, etc.); electrical systems (wiring, raceway, conduit, cable trays, controls, fire and life safety systems, lighting, alarm devices, etc.); structural elements (beams, girders, etc); acoustical systems, ceiling equipment supports.
   2. Exposed Conditions View: Including, but not limited to: mechanical; electrical; structural elements as noted above; acoustical systems; lights – pendants, surface and recessed; exit signage; directional signage; conduit; grilles; diffusers; damper actuators; sprinkler
heads/type, speaker locations, access panels with sizes indicated, smoke detectors and alarm devices, and any other item or element that will be seen when looking at the ceiling.

B. Coordinate space requirements, supports, and installation of mechanical and electrical Work indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

C. Congested Areas: Provide more detailed plan and either vertical sections or 3-dimensional CADD model.

D. Media: CADD plans, sections, and models for color plotting; ".dwg" file format.

E. Show the following in different colors for each system: structure, HVAC, plumbing, piping, electrical, fire protection, other work.

F. Distribute Coordinated Ceiling Drawings among affected entities for review. Resolve conflicts and incorporate corrections into drawings prior to submitting to Architect.

1. Work that is not included in Coordinated Ceiling Drawings shall be coordinated and installed without conflicts or defects, and without change in Time or Cost.

1.07 PRECONSTRUCTION MEETING

A. Owner/Architect will schedule meeting after Notice to proceed.

B. Meeting location shall be either on site at FS or conducted by the Lead Consultant with PM.

C. Attendance Required: Owner, Owner’s project manager, Architect and Contractor.

D. Agenda items at a minimum and/or applicable include the following; List is subject to addition as needed:
   1. Execution of Owner-Contractor Agreement.
   2. Submission of executed bonds and insurance certificates.
   4. Submission of complete list of Subcontractors, with contact information, list of products, schedule of values, submittal schedule, and construction progress schedule with any critical path work sequencing and long lead time materials.
   6. Procedures and processing of field decisions, submittals, substitutions, RFIs, requests for applications for payments, proposal request, Change Orders, and Contract closeout procedures.
   7. Construction site access: pick-up, delivery, and parking; temporary facilities and controls, security, safety, and restrictions.
   8. Scheduling activities of Testing Agent.
   10. Anticipated building service or system interruptions, and impact to building operations/occupants.
   11. Owner occupancy, schedule, and activities requiring accommodation and/or coordination.
   12. Use of site, campus premises, and existing buildings.
   13. Office, work, and storage areas.
   14. All shut-off locations.
   15. Define plan to reduce impact to building users regarding application of finishes, paints, adhesives, etc.
   16. Utility mete removals or connections.
   17. Facilities EH&S items include but are not limited to the following:
      a. List of emergency contacts, and contact information.
      b. Process for accessing emergency assistance.
      c. Process for spills and clean-up.
      d. EH&S expectations regarding maintaining safe conditions for UO employees, students, visitors, construction workers, etc. including odors, egress, avoidance of fire alarms, etc.
      e. If applicable, EH&S expectations regarding compliance with erosion control permits.
E. Contractor shall record minutes and distribute copies within four (4) days after meeting to participants, with one original copy to Architect, Owner and those affected by decisions made.

1.08 CONSTRUCTION PROGRESS MEETING REQUIREMENTS

A. Schedule and administer meetings throughout progress of the Work at maximum weekly intervals.
   1. Architect may elect to attend by telephone conference call.

B. Attendance Required: Job superintendent, major subcontractors and suppliers, Owner, or Owner's representative, Architect/Engineer, as appropriate to agenda topics for each meeting. Architect shall attend in person or via conference call at Architect's discretion.

C. Meeting location shall be on site and conducted by the GC or CM.

D. Meeting minutes shall be by the GC or CM and distributed to attendees and to individuals requesting courtesy copies.
   1. Courtesy copies shall be provided to N&TS.

E. Agenda items at a minimum and/or applicable include the following; List is subject to addition as needed:
   1. Review minutes of previous meetings.
   2. Review of Work progress overall construction schedule progress and status.
   3. Field observations, problems, and decisions.
   4. Identification of problems impeding planned progress.
   5. Review of submittals schedule and status, RFIs and status, and proposal requests/change orders and status.
   6. Review of off-site fabrication and delivery schedules.
   7. Maintenance of construction progress schedule with 3 week detailed schedule of coming weeks' activities and needed shutdowns.
   8. Corrective measures to regain projected schedules.
   9. Planned progress during succeeding work period with 3 week detailed schedule of coming weeks' activities and needed shutdowns.
  10. Coordination of projected progress.
  11. Maintenance of quality and work standards.
  12. Effect of proposed changes on progress schedule and coordination.
  13. Owner schedule and activities requiring accommodation and/or coordination.
  14. Site access & utilization and any changes due to construction or delivery activities.
  15. Work hours and notification of evening or weekend events needing notification to campus.
  17. Pending changes.
  18. Payment request status.
  19. Other business relating to Work.

F. Contractor shall record minutes and distribute copies within four (4) days after meeting to participants, with one (1) original copy to Architect, Owner, and those affected by decisions made.

1.09 PRE-INSTALLATION MEETING

A. When required in individual specification sections, convene pre-installation meeting at Project site prior to commencing work of specific section.

B. Work undertaken or completed without convening a pre-installation meeting shall be subject to removal, inspection, testing, observation, etc. at the Architect's discretion without additional compensation to Contractor in time or money. Work required as a result of removal, inspection, testing, observation, etc., even though determined to be satisfactory, shall be provided without additional compensation to the contractor in time or money.

C. Require attendance of parties directly affecting, or affected by, Work of specific section including the Architect, Owner, Design Engineer, manufacturer (representative and technical support) and key personnel of the installation team.
D. Notify Architect seven (7) days in advance of meeting date.

E. Prepare agenda and preside at meeting:
   1. Review conditions of installation, preparation and installation procedures.
   2. Review coordination with related work.

F. Record minutes and distribute copies within four (4) days after meeting to participants, with one original copy to Architect, Owner, and those affected by decisions made.

END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Preliminary schedule.
   B. Construction progress schedule, with network analysis diagrams and reports.
   C. Short interval schedule.

1.02 REFERENCES
   A. AGC (CPSM) - Construction Planning and Scheduling Manual; Associated General Contractors of America; 2004.

1.03 SUBMITTALS
   A. Within 10 days after date of Agreement, submit Preliminary Schedule defining planned operations for the first 60 days of Work, with a general outline for remainder of Work.
      1. List Owner and other scheduled or projected building user activities and milestones coordinated within the construction activities schedule.
      2. List Owner Furnished Contractor Installed (OFCI) and Owner Furnished Owner Installed (OFOI) items, delivery dates, and completion dates.
      3. Required shutdowns must be requested by the Contractor to PM a minimum of two (2) weeks in advance.
      4. Notify PM for distribution of advanced notice to campus a minimum of forty eight (48) hours prior to start of disruptive work, including but not limited to vibration, noise, or odors that may occur within occupied buildings or neighboring buildings.
      5. List commissioning activities and milestones.
   B. If preliminary schedule requires revision after review, submit revised schedule within 10 days.
   C. Within 20 days after review of preliminary schedule, submit draft of proposed Baseline Schedule for review.
      1. Include written certification that major contractors have reviewed and accepted proposed schedule.
      2. Include narrative report that identifies critical, near-critical and major activities in sufficient detail that explains their significance.
   D. Within 10 days after joint review, submit Baseline Schedule.
   E. Submit updated schedule with each Application for Payment.
   F. Short Interval Schedule: Submit copies to attendees at each Progress Meeting.

1.04 QUALITY ASSURANCE
   A. Scheduler: Contractor's personnel or specialist Consultant specializing in CPM scheduling with 5 years minimum experience in scheduling construction work of a complexity comparable to this Project, and having use of computer facilities capable of delivering a detailed graphic printout within 48 hours of request.

1.05 SCHEDULE FORMAT
   A. Listings: In chronological order according to the start date for each activity. Identify each activity with the applicable specification section number.
   B. Diagram Sheet Size (overall schedule): Maximum 22 x 17 inches or width required.
   D. Scale and Spacing: To allow for notations and revisions.
PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PRELIMINARY SCHEDULE
A. Prepare preliminary schedule in the form of a horizontal bar chart.

3.02 BASELINE SCHEDULE
A. Baseline (Construction Progress) Schedule is a continuation of the Preliminary Schedule that shows the entire, complete construction activity. Actual progress of the Work will be measured against the Baseline Schedule.
B. Revisions to the accepted Baseline Schedule are subject to review and approval.

3.03 CONTENT
A. Show complete sequence of construction by activity, with dates for beginning and completion of each element of construction.
   1. Include Pre-Installation Meetings.
B. Identify each item by specification section number.
C. Show accumulated percentage of completion of each item, and total percentage of Work completed, as of the first day of each month.
D. Provide separate schedule of submittal dates for shop drawings, product data, and samples, owner-furnished products, Products identified under Allowances, and dates reviewed submittals will be required from Architect. Indicate decision dates for selection of finishes.
   1. Refer to Section 01 33 00 for more requirements.
E. Indicate delivery dates for owner-furnished products.
F. Provide legend for symbols and abbreviations used.

3.04 NETWORK ANALYSIS
A. Prepare network analysis diagrams and supporting mathematical analyses using the Critical Path Method.
B. Illustrate order and interdependence of activities and sequence of work; how start of a given activity depends on completion of preceding activities, and how completion of the activity may restrain start of subsequent activities.
C. Mathematical Analysis: Tabulate each activity of detailed network diagrams, using calendar dates, and identify for each activity:
   1. Preceding and following event numbers.
   2. Activity description.
   3. Estimated duration of activity, in maximum 15 day intervals.
   4. Earliest start date.
   5. Earliest finish date.
   6. Actual start date.
   7. Actual finish date.
   8. Latest start date.
   9. Latest finish date.
   10. Total and free float; float time shall accrue to Owner and to Owner’s benefit.
   11. Monetary value of activity, keyed to Schedule of Values.
   12. Percentage of activity completed.
D. Analysis Program: Capable of accepting revised completion dates, and recomputation of all dates and float.
E. Required Reports: List activities in sorts or groups:
   1. By preceding work item or event number from lowest to highest.
   2. By amount of float, then in order of early start.
   3. Listing of activities on the critical path.
3.05 REVIEW AND EVALUATION OF SCHEDULE
   A. Participate in joint review and evaluation of schedule with Architect at each submittal.
   B. Evaluate project status to determine work behind schedule and work ahead of schedule.
   C. After review, revise as necessary as result of review, and resubmit within 10 days.

3.06 UPDATING SCHEDULE
   A. Maintain schedules to record actual start and finish dates of completed activities.
   B. Indicate progress of each activity to date of revision, with projected completion date of each activity.
   C. Annotate diagrams to graphically depict current status of Work.
   D. Identify activities modified since previous submittal, major changes in Work, and other identifiable changes.
   E. Indicate changes required to maintain Date of Substantial Completion.
   F. Submit reports required to support recommended changes.
   G. Provide narrative report to define problem areas, anticipated delays, and impact on the schedule. Report corrective action taken or proposed and its effect including the effects of changes on schedules of separate contractors.

3.07 RECOVERY SCHEDULE
   A. Prepare and submit Recovery Schedule and Narrative Report that demonstrates how lost time will be recovered when one of the following occurs:
      1. Project falls behind schedule more than 14 days.
      2. Project falls behind schedule more than 10% of remaining duration to Substantial Completion.
   B. Submit Recovery Schedule within 7 days of falling behind schedule.
   C. Recovery Schedule is subject to review and approval.

3.08 DISTRIBUTION OF SCHEDULE
   A. Distribute copies of updated schedules to Contractor's project site file, to Subcontractors, suppliers, Architect, Owner, and other concerned parties.
   B. Instruct recipients to promptly report, in writing, problems anticipated by projections shown in schedules.

3.09 SHORT INTERVAL SCHEDULE
   A. Description: Three week schedule of current and near-future construction activity.
      1. Duration: 3 weeks
      2. Time Increment: Day
      3. Bar chart with separate bar for each trade that is active at Site, sequentially organized, beginning with continuing activities.
      4. Indicate crew size for each activity.
      5. If activity differs from Baseline Schedule, compare Baseline to proposed activity as adjacent bars.
      1. Hand drafted or computer generated schedule at Contractor's option.
   C. Update schedule weekly.

END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES

A. Submittal control report and submittal procedure.
B. Proposed products list.
C. Product data.
D. Sustainable building data.
E. Shop drawings.
F. Samples.
G. Design data.
H. Test reports.
I. Certificates.
J. Manufacturer's instructions.
K. Manufacturer's field reports.
L. Construction photographs.

1.02 SUBMITTAL CONTROL REPORT

A. Prepare and maintain a separate material delivery log to monitor submittals required by the contract documents. Show:
   1. Work item number corresponding to the specification section and construction schedule.
   2. Contractor, subcontractor, sub-subcontractor or supplier responsible for each work item.
   3. Narrative description of the work item.
   4. Number of days required for preparation of the submittal.
   5. Date submittal due.
   6. Number of days allowed for approval.
   7. Date approval due.
   8. Number of days required to fabricate and deliver item to the Contractor.
   9. Date of delivery.
   10. Date item required to be installed, corresponding to the construction schedule.

B. Distribution:
   1. Distribution copies of reviewed schedule to: Architect, Owner’s Representative.
   2. Instruct recipients to report any inability to comply and provide detailed explanation with suggested remedies.

1.03 SUBMITTAL PROCEDURE

A. Construction Submittal Requirements:
   1. PM shall receive a minimum of one stamped original of all submittals at the time of Consultant approval.
   2. PM will provide the A/E and GC with a list of submittal items that require concurrent FS Maintenance & PM review and approval prior to official submittal acceptance. This list consists of, but is not limited to the following items:
      a. Variable Frequency Drives, VFD
      b. AHU and motor-mounts
      c. Transformers
      d. Building controls
      e. Soils
      f. Light Fixtures
      g. Backflow devices
      h. Fire Alarm systems
      i. Fire sprinkler components

B. Organize and submit complete information into separate submittals for each Specification Section listed in Table of Contents, except as follows:
SUBMITTAL PROCEDURES

1. Consolidated Division submittal for Sections in the following Divisions:
   a. Division 21, 22, and 23.
   b. Division 26, 27 and 28.
   c. Division 31, 32, and 33, except 1 separate consolidated submittal for Landscaping is acceptable.
2. Doors, door frames and door hardware: 1 consolidated submittal.
3. Exterior curtainwall, storefront and entrance systems: 1 consolidated submittal.
4. Exceptions must be approved by Architect.

C. Number submittals sequentially, followed by specification Section number.
   1. Revisions: Add "R-1" to submittal number; example "034- 08 51 13 R-1".

D. Transmittal or Cover Sheet: Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Architect will discard submittals received from sources other than Contractor.
   1. Transmittal Form: Use CSI Form 12.1A.
   2. Incomplete transmittal form will be returned.

E. Contractor's Review: Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with requirements of the Work and Contract Documents.
   1. Review submittals prior to submission and provide stamp of approval signed or initialed by Contractor.
      a. Contractor’s review indicates that Contractor has thoroughly reviewed the submittal and certifies that it is complete, correct, in compliance with the Contract Documents, and suitable for the Project.
      b. Review represents that field measurements and field conditions have been considered and that the work submitted will perform as intended.
      c. Review of Shop Drawing represents that required coordination with other work has been performed and is indicated in Shop Drawing.
   2. Architect will not review submittals that do not include Contractor's signed review stamp, do not include required field conditions, or are not accurate.
   3. Include written description and graphic demarcation of deviations from requirements of Contract Documents.
   4. All work done prior to approval of submittals shall be at the Contractor’s risk.

F. Clearly indicate all options, colors, accessories, data, etc, provided for this Project.

G. Identify variations from Contract Documents. Identify product limitations which may be detrimental to successful performance of completed Work.

H. Allow space on submittals for Contractor and Architect review stamps.

I. Schedule submittals to expedite Project. Deliver submittals to Architect at SERA Architects Inc. Coordinate submission of related items.
   1. Deliver one additional copy each to Owner

J. For each submittal, allow 14 days excluding delivery time from and to Contractor.
   1. Allow additional 7 days for any one of the following submittals:
      a. Major building components or consolidated submittals.
      b. Review by Architect’s consultant.
      c. Review by Commissioning Agent.

K. When revised for resubmission, identify changes made since previous submission.

L. Distribute copies of reviewed submittals as appropriate. Instruct parties to promptly report inability to comply with requirements.

1.04 PRODUCT DATA

A. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
1. Provide product data whether specified or not specified in Section.
2. If information that must be specially prepared for submittal because standard printed data are not suitable for use, submit as Shop Drawings, not as Product Data.
3. Mark each copy of each submittal to show which products and options are applicable.

B. Include the following information, as applicable:
   1. Manufacturer's written recommendations.
   2. Manufacturer's product specifications.
   3. Manufacturer's installation instructions.
   5. Manufacturer's catalog cuts.
   6. Wiring diagrams showing factory-installed wiring.
   7. Printed performance curves.
   8. Operational range diagrams.
  10. Standard product operation and maintenance manuals.
  11. Compliance with specified referenced standards.
  12. Testing by recognized testing agency.
  13. Application of testing agency labels and seals.
  14. Notation of coordination requirements.

C. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.

D. Indicate product utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

E. Submit one electronic copy in PDF format.

F. Architect will return a reviewed electronic copy in PDF format.

1.05 SUSTAINABLE BUILDING DATA

A. Submit information applicable to Sustainable Building Requirements and Environmental Responsibility.
   1. Recycled content as applicable: Percent post consumer and percent post industrial, on Manufacturer's letterhead or published data certified by SCS.
   2. Rapidly renewable materials as applicable: List percent of materials whose source is replaced or renewed within a 10 year period.
   3. Local materials as applicable: List material amount, cost, source of manufacture and distance to site in miles, on Manufacturer's letterhead.
   4. Locally harvested or extracted as applicable: List material amount, cost, source and distance to site in miles, on Manufacturer's letterhead.
   5. Levels of Volatile Organic Compounds (VOC).

1.06 SHOP DRAWINGS

A. Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on standard printed data or reproductions of the Contract Documents, unless submittal of Architect's CAD Drawings is permitted.
   1. Provide Shop Drawings for work indicated in Sections and when needed to execute the Work.

B. Electronic copy of Architect's CADD drawings (floor plans, site plan and ceiling plans, only) will not be provided.

C. Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
   1. Dimensions.
   2. Three dimensional axonometric views of flashings, pans and sheet metal details.
   3. Identification of products.
   4. Fabrication and installation drawings.
SUBMITTAL PROCEDURES

5. Roughing-in and setting diagrams.
6. Wiring diagrams showing field-installed wiring, including power, signal, and control wiring.
7. Manufacturing instructions.
8. Templates and patterns.
10. Design calculations.
11. Compliance with specified standards.
12. Notation of coordination requirements.
13. Notation of dimensions established by field measurement.
14. Relationship to adjoining construction clearly indicated.
15. Seal and signature of professional engineer if specified.

D. Indicate special utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

E. Submit copies or transparencies as follows:
   1. 8.5 by 11 inch or 11 by 17 inch size: Submit 4 copies on bond paper.
   2. Larger than 11 by 17 inches: Submit 4 copies on bond paper.
   3. Submit 1 additional copy for Architect’s consultant’s review.

1.07 SAMPLES

A. Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.

B. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.

C. Identification: Attach label on unexposed side of Samples that includes the following:
   1. Generic description of Sample.
   2. Product name and name of manufacturer.
   3. Sample source.
   4. Number and title of appropriate Specification Section.

D. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
   1. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
   2. Samples not incorporated into the Work, or otherwise designated as Owner’s property, are the property of Contractor.

E. Samples for Initial Selection: Submit 2 manufacturer’s color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.

F. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
   1. Submit three sets of Samples. Architect will retain one Sample set; remainder will be returned.
   2. Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
   3. If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.
G. Finishes, products and/or materials noted as custom, hand worked, etc shall be submitted to Architect for review and approval prior to fabrication/installation. Allow for minor revisions to sample in terms of finish, fabrication, installation and/or sequencing.

H. Field Samples: Large size samples and assembled samples that shall be submitted at the Project Site are specified in individual Sections.

1.08 DESIGN DATA
A. Prepare written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

B. Submit for Architect's information.

1. Architect's review is limited to assessing conformance with design concept expressed in Contract Documents.

C. Refer to Section 01 33 16 - Delegated Design Procedures.

1.09 TEST REPORTS
A. Submit for Architect's knowledge.

B. Submit test reports for information for limited purpose of assessing conformance with information given and design concept expressed in Contract Documents.

1.10 CERTIFICATES
A. When specified in individual specification sections, submit certification by manufacturer, installation/application subcontractor, or Contractor to Architect, in quantities specified for Product Data.

B. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.

C. Certificates may be recent or previous test results on material or Product, but must be acceptable to Architect.

1.11 QUALIFICATION DATA
A. When specified in individual specification sections or requested by Architect, submit qualifications for manufacturer, installer, or subcontractor.

B. Data may include previous experience, list of previous similar projects, references, proof of training, and approval by manufacturer or warrantor.

1.12 SAMPLE WARRANTY
A. When warranty is specified in a Section, submit sample of specified warranty with initial product submittal.

B. Final warranty submittal is specified in Section 01 78 00 - Closeout Submittals.

1.13 MANUFACTURER'S INSTRUCTIONS
A. When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, to Architect for delivery to Owner in quantities specified for Product Data.

B. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

1.14 MANUFACTURER'S FIELD REPORTS
A. Submit reports for Architect's benefit as contract administrator or for Owner.

B. Submit report in duplicate within 30 days of observation to Architect for information.

C. Submit for information for limited purpose of assessing conformance with information given and design concept expressed in Contract Documents.
1.15 CONSTRUCTION PHOTOGRAPHS

A. Photographic Documentation Requirements by Contractor:
   1. This requirement may be waived at Owner discretion.
   2. Monthly, an 8"x10" printed photograph. On the front of the photograph identify the project name, location where photograph was taken, and month/date/year.
   3. At project start before demolition, a photo record of the project site, surrounding and adjacent structures and conditions.
   4. At final completion, final color photo documentation; date stamped on the back of the photo.
   5. With closeout documentation submittal a complete digital set of all construction photographs shall be included.

B. Provide photographs of site and construction throughout progress of Work.

C. Each month submit photographs with Application for Payment.

D. Photographs: Digital camera, 3.5 mega pixel minimum.

E. Take one (1) site photograph from same direction indicating relative progress of the Work.

F. Deliver digital copies to Owner on approved media (CD, DVD) with project record documents. Catalog and index files in chronological sequence; include word processor table of contents.

END OF SECTION
Electronic Media Agreement

THIS AGREEMENT is entered into effective [insert date] by and between [insert party's company name] ("Recipient") and SERA Architects, Inc. ("SERA") with respect to the [insert project name] ("Project") located at [insert location].

The Recipient has requested that SERA provide to the Recipient certain drawings, specifications or other documents for the Project in electronic form ("Electronic Form Documents"). SERA agrees to do so, subject to the terms and conditions of this Agreement.

The Recipient recognizes that the Electronic Form Documents may be revised by others without the knowledge or consent of SERA and, when plotted, may result in variances or corrupt other files of the user.

The Recipient agrees not to use the Electronic Form Documents for any purpose or project other than the Project.

The Recipient acknowledges that the Electronic Form Documents are the property of SERA or its consultants and are subject to the copyrights and other reserved rights of those parties. The Electronic Form Documents may be write-protected by SERA such that no data can be manipulated by the Recipient or third parties. SERA may provide to the Recipient only a working copy of Electronic Form Documents which have all indices of SERA, its consultants, and their respective ownership, professional names, and involvement in the Project removed from the electronic display.

Any use of or changes to the Electronic Form Documents shall be at the sole risk of the user, and without liability, risk or legal exposure to SERA or its consultants. The Recipient and any other person or entity using the Electronic Form Documents agrees to release and, to the fullest extent permitted by law, indemnify, hold harmless and defend SERA, its consultants, and their respective partners, shareholders, agents and employees from and against any and all claims, demands, losses, expenses, damages, penalties and liabilities of any kind, including without limitation attorneys’ and expert witnesses’ fees, arising out of or relating in any way to any such use of or changes to the Electronic Form Documents.

Under no circumstances shall SERA’s transfer of the Electronic Form Documents to the Recipient be deemed a sale by SERA or its consultants. SERA and its consultants make no warranties, either expressed or implied, with respect to the Electronic Form Documents, including but not limited to warranties of merchantability or of fitness for any particular purpose.

The Recipient agrees, as a condition of providing the Electronic Form Documents to any contractor, design professional or other person or entity, to require such third party to agree in writing to the terms and conditions of this Agreement.

By electronically accessing the Electronic Form Documents, the Recipient accepts and is bound to the terms and conditions of this Agreement.

**RECIPIENT:**
Company:________________________
Signature:_______________________
Printed Name:____________________
Title:__________________________
Date:___________________________

**SERA:**
SERA Architects, Inc.
Signature:_______________________
Printed Name:____________________
Title: Principal__________________
Date:___________________________
PART 1 - GENERAL

1.01 SUMMARY

A. Section includes:
   2. Permitting for Delegated Design portion of Work.
   3. Delegated Design submittals.

B. Coordinate and assume full responsibility for design, engineering, submittals, fabrication, transportation, and installation of this work.

C. Delegated Design portions include the following:
   1. Temporary shoring and supports for excavation, concrete, walls and other construction.
   2. Section 03 30 00 - Concrete mix design.
   3. Section 03 38 00 - Post-Tensioned Concrete
   4. Section 03 45 00 - Architectural Precast Concrete
   5. Section 05 50 00 - Metal Fabrications, for fabricated railings.
   6. Section 05 51 00 - Metal Stairs.
   7. Section 05 52 13 - Pipe and Tube Railings
   8. Section 05 73 00 - Decorative Metal Railings
   9. Section 06 17 53 - Shop-Fabricated Wood Trusses; Plate-connected wood trusses.
   10. Section 07 42 13 - Metal Wall Panels; for furring system and panel attachment to structure.
   11. Section 07 42 14 - Insulated Metal Wall Panels; for furring system and panel attachment to structure.
   12. Section 07 42 64 - Composite Wall Panels; Composite panels and supports
   13. Section 07 62 00 - Sheet Metal Flashing and Trim;
   14. Section 07 81 00 - Applied Fireproofing.
   15. Section 07 84 00 - Firestopping
   16. Section 08 43 13 - Aluminum Storefronts.
   17. Section 08 44 13 - Glazed Aluminum Curtain Walls.
   18. Section 08 46 13 - Aluminum Window Wall
   19. Section 08 53 13 - Vinyl Windows
   20. Section 08 54 00 - Fiberglass Windows
   21. Section 08 63 00 - Metal Framed Skylights
   22. Section 08 80 00 - Glazing, for glass strength.
   23. Section 09 21 16 - Gypsum Board Assemblies; For non-structural metal-framed interior partitions, gypsum board ceiling suspension systems and perimeter requirements, and seismic bracing.
   24. Section 09 51 00 - Acoustical Ceilings, for ceiling suspension systems.
   25. Section 11 24 23 - Fall protection.
   26. Section 11 24 23 - Window Washing Equipment
   27. Section 14 20 10 - Passenger Elevators, including supports for rails, sills and hoisting beams in Division 05. Elevators submittal through normal process, permit costs included for state inspection, and AHJ.
   28. Division 21 - Fire suppression system.
   29. Divisions 21, 22 and 23 - seismic restraint of systems.
   30. Divisions 26, 27 and 28 - seismic restraint of systems.
   31. Division 28 - Fire detection and alarms.
   32. Section 32 80 00 - Irrigation Systems.
   33. See structural notes for other delegated design items.

1.02 DEFINITIONS

A. Delegated Design: Professional design service or certification specifically required of the Contractor in the Specifications.

B. AHJ: Authorities Having Jurisdiction, defined in Section 01 10 00 and AIA Document A201.
1.03 PERFORMANCE REQUIREMENTS

A. Comply with Regulations.
B. Provide complete, operational systems that perform their intended use.
C. Engineer Delegated Design portions for gravity, lateral and seismic loads.
   1. Load criteria is indicated in Structural Drawings. If not indicated, request criteria.
   2. Indicate reactions to structure.
   3. Provide services of a qualified professional engineer licensed in the Project jurisdiction.
D. Calculate and complete energy forms required by AHJ.
E. Execute the design intent as indicated in Project Drawings and Specifications.
F. Obtain Permits and inspections and pay fees required by AHJ.

1.04 OWNER'S RESPONSIBILITIES

A. The Owner will not pay for progress delays, additional Work, additional products, restocking, or re-working required by Contractor's failure to coordinate Delegated Design work with other Project work.

1.05 SUBMITTALS

A. Preliminary Design: Submit to Architect drawings and product data that describe Contractor’s design prior to performing engineering calculations and Shop Drawings.
   1. Architect will evaluate proposed design and comment on conformance with intent of Contract Documents.
   2. Preliminary review is for aesthetic and general function concerns and will not constitute approval of engineering.
   3. Purpose of this submittal is to avoid engineering and detailing an unacceptable proposal.
B. Permit Review: Submit Delegated Design documents to AHJ for review and approval.
   1. When AHJ requires review by Architect or Architect’s consultant, allow 10 days for Architect's review. Submit documents to Architect and pick-up documents when review is complete. Make corrections noted by Architect.
   2. Obtain permits prior to executing work component.
   3. Comply with AHJ requirements.
   4. Execute corrections to Delegated Design work required by AHJ at no cost to Owner and prior to Substantial Completion.
      a. Notify Architect of changes required by AHJ as soon as they are known.
   5. Include design criteria, design assumptions, structural calculations, fabrication and construction details, required clearances, and interface requirements.
      a. Delegated Design drawings are in addition to Shop Drawings.
   6. Affix Design Professional’s seal for State License on Submittals.
C. Engineer's qualifications.
D. Product Data, Shop Drawings and Samples: Comply with requirements in Section 01 33 00 for each product of Delegated Design portion of work. Product submittals are in addition to submittals for permit and design data.

1.06 QUALITY ASSURANCE

A. Documentation: Comply with the following:
   2. Minimum text size: 1/8 inch
   3. Legible when microfilmed
   4. Other requirements of AHJ
B. Design requirements specific to Delegated Design portions are indicated in Drawings and in Sections that specify the component.
C. Engineer's 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 the kind indicated.

D. Pre-Submittal Meeting: Contractor shall meet with Architect, Consultant, and Delegated Designer to discuss requirements of work-portion, submittals, scheduling and sequencing.

1.07 SCHEDULING

A. Schedule design process and submittals required for Delegated Design portions to fit within Construction Schedule.

B. Allow adequate time for AHJ review. Contact AHJ for time estimate and coordination of schedule.

C. If Architect's approval of Shop Drawings is required prior to application for permit, schedule and sequence Shop Drawing review prior to review of permit submittal. Allow time specified in Section 01 33 00.

END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES

A. References and standards.
B. Quality assurance submittals.
C. Mock-up.
D. Control of installation.
E. Tolerances.
F. Testing and inspection services.
G. Manufacturers' field services.

1.02 REFERENCE STANDARDS


1.03 DEFINITIONS

A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
B. Quality-Control Services: 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. Services do not include contract enforcement activities performed by Architect.
C. Mock-Up: Full-size, physical assemblies that are constructed on-site. Mock-ups are used to verify selections made under sample submittals, to demonstrate aesthetic effects and, where indicated, qualities of materials and execution, and to review construction, coordination, testing, or operation; they are not Samples.
   1. Approved mock-ups establish the standard by which the Work will be judged.
D. Laboratory Mock-up: Full-size, physical assemblies that are constructed at testing facility to verify performance characteristics.
E. Preconstruction Testing: Tests and inspections that are performed specifically for the Project before products and materials are incorporated into the Work to verify performance or compliance with specified criteria.
F. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with industry standards.
G. Source Quality-Control Testing: Tests and inspections that are performed at the source, i.e., plant, mill, factory, or shop.
H. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
I. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.
J. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.
   1. Using a term such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to tradespeople of the corresponding generic name.

K. Experienced: When used with an entity, "experienced" means having successfully completed a minimum of 10 previous projects similar in size and scope to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

1.04 INDUSTRY STANDARDS
A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.

B. Publication Dates: Comply with standards in effect as of date of Contract Documents, unless otherwise indicated.

C. Copies of Standards: Each entity engaged in construction on the Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.
   1. When copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.
   2. When copies of standards are needed for any reason, obtain copies directly from publication source.

D. Abbreviations and Acronyms for Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the standards and regulations in the following list.
   1. ADAAG or ADAAmericans with Disabilities Act
   2. CFRCode of Federal Regulations
   3. DODDepartment of Defense Military Specifications and Standards
   4. FSFederal Specification
   5. MILSPECMilitary Specification and Standards
   6. UFASUniform Federal Accessibility Standards

E. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in Gale Research's "Encyclopedia of Associations" or in Columbia Books' "National Trade & Professional Associations of the U.S."

1.05 CONFLICTING REQUIREMENTS
A. General: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to Architect for a decision before proceeding.

B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

1.06 SUBMITTALS
A. Reports: Prepare and submit certified written reports that include the following:
QUALITY REQUIREMENTS

1. Date of issue.
2. Project title and number.
3. Name, address, and telephone number of testing agency.
4. Dates and locations of samples and tests or inspections.
5. Names of individuals making tests and inspections.
6. Description of the Work and test and inspection method.
8. Complete test or inspection data.
9. Test and inspection results and an interpretation of test results.
10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
12. Name and signature of laboratory inspector.
13. Recommendations on retesting and reinspecting.
14. Distribution: Contractor, Architect, Engineer of Record, Authority Having Jurisdiction, Owner (verify), and Construction Manager (when appropriate).

B. Deficiencies Report: Attach a separate list of deficiencies identified in previous reports that have not been corrected and successfully retested.
   1. Submit a final report certifying the status of all deficiencies, signed and stamped. Submit report directly to Authority having jurisdiction (when required) and copy to others.

C. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

D. Testing Agency Qualifications:
   1. Prior to start of Work, submit agency name, address, and telephone number, and names of full time registered Engineer and responsible officer.

1.07 TESTING AND INSPECTION AGENCIES

A. Owner will employ and pay for services of an independent testing agency to perform specified testing and inspection.
   1. Owner's testing agent will perform "special inspections" required by Regulations.

B. Contractor shall employ and pay for services of an independent testing agency to perform other testing and inspection specified as Contractor's responsibility or required by Contractor for quality control.

C. Employment of agency in no way relieves Contractor of obligation to perform Work in accordance with requirements of Contract Documents.

D. Contractor Employed Agency:
   2. Inspection agency: Comply with requirements of ASTM D3740 and ASTM E329.
   3. Laboratory: Authorized to operate in the State in which the Project is located.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 CONTROL OF INSTALLATION

A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.

B. Comply with manufacturers' instructions, including each step in sequence.

C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.
QUALITY REQUIREMENTS

D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

E. Have Work performed by persons qualified to produce required and specified quality.

F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.

G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.
   1. Design anchorage and attachments to resist seismic forces when required by Regulations.

3.02 MOCK-UP

A. Before installing portions of the Work requiring mockups, build mock-up for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:
   1. Build mock-up in location and of size indicated or, if not indicated, as directed by Architect.
   2. Notify Architect seven days in advance of dates and times when mock-up will be constructed.
   3. Demonstrate the proposed range of aesthetic effects and workmanship.
   4. Obtain Architect's approval of mock-up before starting work, fabrication, or construction.
      a. Allow seven days for initial review and each re-review of mock-up.
   5. Maintain mock-up during construction in an undisturbed condition as a standard for judging the completed Work.

B. Tests will be performed under provisions identified in this section and identified in the respective product specification sections.

C. Assemble and erect specified items with specified attachment and anchorage devices, flashings, seals, and finishes.

D. Accepted mock-up shall be a comparison standard for the remaining Work.

E. Where mock-up has been accepted by Architect and is specified in product specification sections to be removed, remove mock-up and clear area when directed to do so.
   1. Deconstruct and recycle mock-up that is not incorporated in Work.

3.03 TOLERANCES

A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.

B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Architect before proceeding.

C. Adjust products to appropriate dimensions; position before securing products in place.

3.04 TESTING AND INSPECTION

A. Testing Agency Duties:
   2. Perform specified sampling and testing of products in accordance with specified standards.
   3. Ascertain compliance of materials and mixes with requirements of Contract Documents.
   4. Promptly notify Architect and Contractor of observed irregularities or non-conformance of Work or products.
   5. Perform additional tests and inspections required by Architect.
   6. Submit reports of all tests/inspections specified.

B. Limits on Testing/Inspection Agency Authority:
   1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
2. Agency may not approve or accept any portion of the Work.
3. Agency may not assume any duties of Contractor.
4. Agency has no authority to stop the Work.

C. Contractor Responsibilities:
   1. Deliver to agency at designated location, adequate samples of materials proposed to be used that require testing, along with proposed mix designs.
   2. Cooperate with laboratory personnel, and provide access to the Work and to manufacturers’ facilities.
   3. Provide incidental labor and facilities:
      a. To provide access to Work to be tested/inspected.
      b. To obtain and handle samples at the site or at source of Products to be tested/inspected.
      c. To facilitate tests/inspections.
      d. To provide storage and curing of test samples.
   4. Notify Architect and laboratory 24 hours prior to expected time for operations requiring testing/inspection services.
   5. Employ services of an independent qualified testing laboratory and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
   6. Arrange with Owner’s agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.

D. Re-testing required because of non-conformance to specified requirements shall be performed by the same agency on instructions by Architect.

E. Re-testing required because of non-conformance to specified requirements shall be paid for by Contractor.

F. Re-testing required because of non-conformance to specified requirements shall be performed by the same agency on instructions by Architect. Payment for re-testing will be charged to the Contractor by deducting testing charges from the Contract Price.

3.05 MANUFACTURERS’ FIELD SERVICES
   A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust and balance of equipment as applicable, and to initiate instructions when necessary.
   B. Submit qualifications of observer to Architect 30 days in advance of required observations.
      1. Observer subject to approval of Architect.
   C. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers’ written instructions.

3.06 DEFECT ASSESSMENT
   A. Replace Work or portions of the Work not conforming to specified requirements.
   B. If, in the opinion of Architect, it is not practical to remove and replace Work, Architect will direct an appropriate remedy or adjust payment.

END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES

A. Measuring moisture vapor emission of new concrete floors.
   1. Calcium Chloride (CaCl2) Test.
   2. In-situ Relative Humidity Test.

B. Measuring alkalinity (pH) of new concrete floors.

1.02 RELATED SECTIONS

A. Section 01 30 00 - Administrative Requirements for submittal procedures.
B. Section 01 40 00 - Quality Requirements for quality assurance, laboratory responsibilities and laboratory reports.
C. Section 01 50 00 - Temporary Facilities and Controls: Temporary heating, cooling and ventilating.
D. Section 03 30 00 - Cast-In-Place Concrete; for substrate to be tested.

1.03 REFERENCES

A. ASTM F 1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.

1.04 PERFORMANCE REQUIREMENTS

A. Provide suitable concrete floor substrate for application of finish floor systems that will meet finish floor manufacturer's installation requirements.

B. Moisture vapor emission testing:
   1. Moisture dome testing (calcium chloride test):
      a. Moisture vapor test results to achieve three pounds per 1,000 square feet of concrete floor surface per 24 hours, or as allowed by flooring (or adhesive) manufacturer, when tested in conformance with ASTM F 1859.
   2. In-situ relative humidity test:
      a. In-situ relative humidity test results to achieve relative humidity reading of no greater than 75 percent or as allowed by flooring (or adhesive) manufacturer, when tested in conformance with ASTM F 2170.

C. Concrete slab surface pH testing:
   1. Alkalinity testing with probe or pH testing paper to achieve an alkalinity pH no more than 7 and no greater than 9 or as allowed by flooring (or adhesive) manufacturer when tested in conformance with ASTM F 710.

1.05 SUBMITTALS

A. Product Data: Submit manufacturer's product data for all testing materials proposed for Work of this Section.

B. Letter of Verification of Environmental Conditions as below.

C. Test Reports: Submit moisture vapor emission and alkalinity test reports in accordance with requirements of Section 01 30 00.

1.06 ENVIRONMENTAL CONDITIONS

A. Prior to testing for moisture vapor emissions rate, space shall be enclosed, fully weather-tight, wet work shall be complete and normally dry, work above ceilings finished. The test site shall be at the same temperature and humidity expected during normal use.

B. Building Temperature: Minimum 65 degrees F. Maximum 85 degrees F.

C. Interior Relative Humidity: Minimum 40 percent. Maximum 60 percent.

D. Maintain specified environmental conditions not less than 72 hours prior to conducting tests and throughout duration of the tests.
1.07 QUALITY CONTROL
   A. Testing shall be conducted not less than 120 days after date of last pour of concrete slab to be
      tested.
   B. Quantity of Tests Required:
      1. Not less than 3 test are required for the first 1,000 square feet plus one test per each
         additional 1,000 square feet or fraction thereof.

PART 2 PRODUCTS
2.01 MOISTURE VAPOR EMISSION TESTING
   A. Moisture Dome Testing: Conform to requirements of ASTM F 1869.
      1. Anhydrous Calcium Chloride (CaCl2) Test Kits: Kits shall contain a plastic spherical dome
         with a factory installed silicone gasket, weight ring, airtight foil bag of calcium chloride
         (approximately 30 grams), and a plastic dish with snap-top lid and label.
         a. This test requires use of a gram-weight scale with a gradation of 1/10th (0.1) gram.
      2. Approved Manufacturers:
         b. Other manufacturers: Comply with Section 01 60 00 - Product Requirements.
   B. In-situ Relative Humidity Testing is required to be performed by an independent testing
      laboratory using relative humidity moisture meter kits and sensors conforming to requirements
      of ASTM F 2170.

2.02 CONCRETE SLAB SURFACE pH TESTING
   A. pH Tester with a surface probe.
   B. pH Test Kits: Kits shall contain pH paper, pH pencil and pH color chart for comparison.

PART 3 EXECUTION
3.01 PREPARATION
   A. General:
      1. Prior to testing, verify that environmental conditions have been met.
      2. Heating ventilating and air conditioning system is operating or temporary heat, cooling and
         ventilating system is operating.
      3. Lay Out Test Area: Measure the space to be tested. Layout the test sites in a rectangular,
         quasi rectangular or a cross-diagonal grid. Come in 5 feet from any exterior wall and place
         test kits at even intervals. Complete the grid. Record the location of each test site on a
         Record Drawing.
   B. Moisture Dome Testing:
      1. Surface Preparation:
         a. For each test area, expose a surface area of 20 inches square.
         b. Grind or sand the concrete surface. Test area shall be clean and free of all foreign
            substances; including curing compounds, sealers, paint, oil, resins, parting
            compounds, floor leveling compounds, dirt, etc.
      2. After surface preparation is complete and prior to testing, allow space to remain
         undisturbed for 24 hours.
   C. In-situ Relative Humidity Test:
      1. Drill 5/8 inch diameter test site holes to a depth equal to 40 percent of the slab's thickness
         for slabs on grade and 20 percent for elevated slabs.

3.02 TESTING
   A. Using a vacuum, remove any dust or dirt from concrete surface where moisture dome test kit is
      to be placed or in the case of an insitu relative humidity test clean debris from hole then insert
      plastic sleeve and cap sleeve. Do not use solvents or water to clean the concrete.
   B. Moisture Dome Testing: Perform in accordance with requirements of ASTM F 1869.
1. Install moisture vapor emission test kits according to manufacturer's published instructions.

2. Test results are sensitive to testing procedures. Take care to follow manufacturer's instructions.

3. Allow test kits to remain in place undisturbed for 60 to 72 hours.

C. In-situ Relative Humidity Test: Perform testing in accordance with requirements of ASTM F 2170.
   1. Allow probe sensor at each test site 72 hours equilibration time prior to reading relative humidity levels.
   2. After equilibration, take a probe into the sleeve and obtain relative humidity level readings from the bottom of the hole.
   3. Testing density is required to equal 3 tests in the first 1,000 square feet, with one additional test per each additional 1,000 square feet of concrete slab surface.
   4. Once satisfactory relative humidity testing results are achieved, patch testing site holes prior to application of finish flooring.

D. Alkalinity Testing Using pH Tester:
   1. Conduct test adjacent each location of test for moisture vapor emission.
   2. With the concrete already clean, pour approximately 2 tablespoons of distilled water onto surface of concrete.
   3. Allow distilled water to stand for approximately 3 minutes. While waiting, lightly stir water to help it absorb any of the salts.
   4. Place tip of surface probe into the distilled water solution to obtain results.

E. Alkalinity Testing Using pH Paper:
   1. Conduct test adjacent each location of test for moisture vapor emission.
   2. With the concrete already clean, pour approximately 2 tablespoons of distilled water onto surface of concrete.
   3. Allow distilled water to stand for approximately 3 minutes. While waiting, lightly stir water to help it absorb any of the salts.
   4. After the allotted time, place a pH paper into the distilled water solution and then compare the color changes in the paper with the pH chart to obtain results.

F. Record data and results and submit in accordance with Section 01 30 00.

END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Temporary utilities.
   B. Temporary telecommunications services.
   C. Temporary sanitary facilities.
   D. Temporary Controls: Barriers, enclosures, and fencing.
   E. Security requirements.
   F. Vehicular access and parking.
   G. Waste removal facilities and services.
   H. Project identification sign.
   I. Field offices.

1.02 TEMPORARY AND CONSTRUCTION UTILITIES
   A. Provide and pay for all electrical power, lighting, water, heating and cooling, and ventilation
      required for construction purposes.
   B. Existing facilities may not be used.
   C. New permanent facilities may be used.
   D. Use trigger-operated nozzles for water hoses, to avoid waste of water.
   E. All shut-off locations are to be documented for emergency purposes prior to pre-construction
      meeting.
   F. Documentation of locations is to be distributed to PM, Facilities Zone Supervisor, DPS, EH&S,
      and any others determined by individual projects.

1.03 TELECOMMUNICATIONS SERVICES
   A. Provide, maintain, and pay for telecommunications services to field office at time of project
      mobilization.
   B. Telecommunications services shall include:

1.04 TEMPORARY SANITARY FACILITIES
   A. Provide and maintain required facilities and enclosures. Provide at time of project mobilization.
   B. Maintain daily in clean and sanitary condition.

1.05 BARRIERS
   A. Provide barriers to prevent unauthorized entry to construction areas, to prevent access to areas
      that could be hazardous to workers or the public, to allow for owner's use of site and to protect
      existing facilities and adjacent properties from damage from construction operations and
      demolition.
   B. Provide barricades and covered walkways required by governing authorities for public
      rights-of-way and for public access to existing building.
   C. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

1.06 FENCING
   A. Provide 6 foot high fence around construction site; equip with vehicular and pedestrian gates
      with locks.

1.07 EXTERIOR ENCLOSURES
   A. Provide temporary insulated weather tight closure of exterior openings to accommodate
      acceptable working conditions and protection for Products, to allow for temporary heating and
      maintenance of required ambient temperatures identified in individual specification sections,
      and to prevent entry of unauthorized persons. Provide access doors with self-closing hardware
      and locks.
1.08 INTERIOR ENCLOSURES
   A. Provide temporary partitions and ceilings as indicated to separate work areas from
      Owner-occupied areas, to prevent penetration of dust and moisture into Owner-occupied areas,
      and to prevent damage to existing materials and equipment.
   B. Construction: Framing and reinforced polyethylene sheet materials with closed joints and
      sealed edges at intersections with existing surfaces:

1.09 SECURITY AND ACCESS TO CONSTRUCTION SITES
   A. Provide security and facilities to protect Work, existing facilities, and Owner's operations from
      unauthorized entry, vandalism, or theft.
   B. DPS and PM are to be consulted to determine strategies to be implemented.
   C. UO Fire Marshal and EH&S consultation regarding egress routes from the project site and
      adjacent buildings to be provided and maintained at all times.
   D. ADA routes must be provided and maintained at all times from the site & adjacent buildings.
   E. Parking within site fencing is controlled and managed by the GC.
   F. If the project does not have site fencing then parking is restricted by issued parking permits
      through DPS in designated locations only. Parking permits are requested of DPS by the PM.

1.10 VEHICULAR ACCESS AND PARKING
   A. Coordinate access and haul routes with governing authorities and Owner.
   B. Provide and maintain access to fire hydrants, free of obstructions.
   C. Provide means of removing mud from vehicle wheels before entering streets.
   D. Provide temporary parking areas to accommodate construction personnel. When site space is
      not adequate, provide additional off-site parking.

1.11 WASTE REMOVAL
   A. Provide waste removal facilities and services as required to maintain the site in clean and
      orderly condition.
   B. Provide containers with lids. Remove trash from site periodically.
   C. If materials to be recycled or re-used on the project must be stored on-site, provide suitable
      non-combustible containers; locate containers holding flammable material outside the structure
      unless otherwise approved by the authorities having jurisdiction.
   D. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers
      with lids.

1.12 PROJECT IDENTIFICATION
   A. Provide project identification sign of design and construction indicated on Drawings.
   B. Erect on site at location indicated.
   C. No other signs are allowed without Owner permission except those required by law.
   D. Only two types of signs fixed to construction fencing are allowed:
   E. One sign to identify the project, project purpose, project rendering and design team.
   F. One sign to list the general and sub-contractors.

1.13 FIELD OFFICES
   A. Office: Weathertight, with lighting, electrical outlets, heating, cooling equipment, and equipped
      with sturdy furniture, drawing rack and drawing display table.
   B. Provide space for Project meetings, with table and chairs to accommodate 6 persons.
   C. Locate offices a minimum distance of 30 feet from existing and new structures.
PART 2 PRODUCTS - NOT USED
PART 3 EXECUTION - NOT USED

END OF SECTION
PART 1 - GENERAL

1.01 SECTION INCLUDES
A. General protection and pruning of existing trees and plants that are affected by execution of the Work, whether temporary or permanent construction.

1.02 DEFINITIONS
A. Caliper: Diameter of a trunk measured by a diameter tape at 6 inches above the ground for trees up to, and including, 4-inch size; and 12 inches above the ground for trees larger than 4-inch size.
B. Plant-Protection Zone: Area surrounding individual trees, groups of trees, shrubs, or other vegetation to be protected during construction, and indicated on Drawings.
C. Vegetation: Trees, shrubs, groundcovers, grass, and other plants.

1.03 SUBMITTALS
A. Product Data: For each type of product indicated:
   1. Organic Mulch.
   2. Protection-Zone Fencing.
   3. Protection-Zone Signage.
B. Tree Pruning Schedule: Written schedule detailing scope and extent of pruning of trees to remain that interfere with or are affected by construction:
   1. Species and size of tree.
   2. Location on site plan. Include unique identifier for each.
   3. Reason for pruning.
   4. Description of pruning to be performed.
   5. Description of maintenance following pruning.
C. Qualification Data: For qualified arborist and tree service firm.
D. Certification: From arborist, certifying that trees indicated to remain have been protected during construction according to recognized standards and that trees were promptly and properly treated and repaired when damaged.
E. Maintenance Recommendations: From arborist, for care and protection of trees affected by construction during and after completing the Work.
F. Existing Conditions: Documentation of existing trees and plantings indicated to remain, which establishes preconstruction conditions that might be misconstrued as damage caused by construction activities.
   1. Use sufficiently detailed photographs or videotape.
   2. Include plans and notations to indicate specific wounds and damage conditions of each tree or other plants designated to remain.

1.04 QUALITY ASSURANCE
A. Arborist Qualifications: Certified Arborist as certified by International Society of Arborists (ISA).
B. Tree Service Firm Qualifications: An experienced tree service firm that has successfully completed temporary tree and plant protection work similar to that required for this Project and that will assign an experienced, qualified arborist to Project site during execution of the Work.
C. Preinstallation Conference: Conduct conference at location to be determined by Owner's Representative Pre-installation conference shall be arranged 4 weeks prior to beginning of construction.
   1. Review methods and procedures related to temporary tree and plant protection and soil protection including, but not limited to, the following:
      a. Construction schedule. Verify availability of materials, personnel, and equipment needed to make progress and avoid delays.
      b. Enforcing requirements for protection zones.
      c. Arborist's responsibilities.
      d. Field quality control.
1.05 PROJECT CONDITIONS

A. The following practices are prohibited within protection zones:
   1. Storage of construction materials, debris, or excavated material.
   2. Foot traffic.
   3. Erection of sheds or structures.
   4. Impoundment of water.
   5. Excavation or other digging unless otherwise indicated.

B. Do not direct vehicle or equipment exhaust toward protection zones.

C. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones and organic mulch.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Organic Mulch: Free from deleterious materials and suitable as a top dressing for trees and shrubs, and soil protection areas consisting of one of the following:
   1. Type: Ground or shredded bark.
   2. Size Range: 2 inches maximum, 1/2 inch minimum.

B. Protection-Zone Fencing: Fencing anchored into a fixed position and meeting the following requirements.
   1. Chain-Link Protection-Zone Fencing: Galvanized-steel fencing fabricated from minimum 2-inch opening, 0.148-inch-diameter wire chain-link fabric; with pipe posts, minimum 2-3/8-inch OD line posts, and 2-7/8-inch OD corner and pull posts; with 1-5/8-inch OD top rails; with 0.177-inch diameter top tension wire and 0.177-inch diameter bottom tension wire; with tie wires, hog ring ties, and other accessories for a complete fence system.
      a. Height: 6 feet.

C. Protection-Zone Signage: Shop-fabricated, rigid plastic or metal sheet with attachment holes prepunched and reinforced; legibly printed with nonfading lettering and as follows:
   1. Size and Text: As shown on Drawings.
   2. Lettering: 3-inch high minimum, black characters on white background.

D. Matting: 1/2" thick polyethylene
   1. Available manufacturers or approved equal:
      a. Alturnamat

E. Geotextile Fabric:
   1. Filter fabric shall be pervious synthetic polymer, non-woven, from continuous filaments. Fabric shall be EX 250 manufactured by Exxon Chemical Company, or approved equal.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Erosion and Sedimentation Control: Examine the site to verify that temporary erosion- and sedimentation-control measures are in place. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross protection zones.

3.02 PREPARATION

A. Locate and clearly identify trees, shrubs, and other vegetation to remain or to be relocated. Tie a 1-inch blue-vinyl tape around each tree trunk at 54 inches above the ground.

B. Protect tree root systems from damage caused by runoff or spillage of noxious materials while mixing, placing, or storing construction materials. Protect root systems from ponding, eroding, or excessive wetting caused by dewatering operations.

C. Tree-Protection Zones: Mulch areas inside tree-protection zones and other areas indicated.
1. Apply 4-inch average thickness of organic mulch. Do not place mulch within 24 inches of tree trunks.
2. Prior to any demolition, outline materials and procedures to be used in protecting Zones of Protection. These are to include scheduling of mulching and maintenance, procedures for obtaining variances, relative timing for removal of protective fencing and procedures for protecting Zones of Protection after fencing is removed. FS Exterior Supervisor must be notified and consulted before removal of protection fencing occurs.

3.03 TREE- AND PLANT-PROTECTION ZONES

A. Protection-Zone Fencing: Install protection-zone fencing along edges of indicated protection zones before materials or equipment are brought on the site and construction operations begin in a manner that will prevent people from easily entering protected area except by entrance gates. Construct fencing so as not to obstruct safe passage or visibility at vehicle intersections where fencing is located adjacent to pedestrian walkways or in close proximity to street intersections, drives, or other vehicular circulation.
   1. Chain-Link Fencing: Install to comply with ASTM F 567 and with manufacturer's written instructions.
   2. Posts: Set or drive posts into ground one-third the total height of the fence without concrete footings. Where a post is located on existing paving or concrete to remain, provide appropriate means of post support acceptable to Architect.
   3. Access Gates: Install where indicated; adjust to operate smoothly, easily, and quietly, free of binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range. Confirm that latches and locks engage accurately and securely without forcing or binding.

B. Protection-Zone Signage: Install protection-zone signage in visibly prominent locations in a manner approved by Landscape Architect and FS Exterior Supervisor. Install one sign spaced approximately every 35 feet on protection-zone fencing, but no fewer than four signs with each facing a different direction.
   1. Protection-Zone Signage shall have a posted notice listing prohibited activities that must have prior authorization. These notices shall remain in place until a combined authorization is granted by the Landscape Architect, Arborist, and FS Exterior Supervisor.
   2. Protection-Zone Signage prohibited activities to be listed and posted on signage:
      a. Removal or moving of protective fencing.
      b. Parking and driving of vehicles
      c. Storing of equipment.
      d. Excavations.
      e. Flooding and cleanup of equipment, tools, etc.
      f. Operation of equipment.
      g. Staging of materials.
      h. Trenching.
      i. Stockpiling.
      j. Altering Drainage

C. Submit requests to work within the Zones of Protection following procedures established by the Landscape Architect and FS Exterior Supervisor must be notified and consulted before work occurs.

D. Maintain protection zones free of weeds and trash.

E. Tree trunks are to be protected as specified by the Landscape Architect and project’s Arborist.

F. Repair or replace trees, shrubs, and other vegetation indicated to remain or be relocated that are damaged by construction operations, in a manner approved by Landscape Architect and FS Exterior Supervisor.

G. Maintain protection zone fencing and signage in good condition as acceptable to Landscape Architect and FS Exterior Supervisor and remove when construction operations are complete and equipment has been removed from the site.
1. Do not remove protection-zone fencing, even temporarily, to allow deliveries or equipment access through the protection zone.
2. Temporary access is permitted subject to preapproval in writing by arborist if a root buffer effective against soil compaction is constructed as directed by arborist. Maintain root buffer so long as access is permitted.
3. Fencing may not be moved or removed without prior Arborist, Landscape Architect, and FS Exterior Supervisor approvals.
4. When fencing is removed all protection requirements still apply.

H. Prevent damage to plant materials including trees, ground cover, root systems, soil, bark, foliage, branches, and limbs due to construction activities that include, but are not limited to the following:
   1. Soil contamination, erosion and compaction.
   2. Excessive wetting, ponding and construction run-off.
   3. Alteration of grade, stockpiling of soil, debris and materials.
   4. Damage to soil, roots, bark, trunk, limbs, branches and foliage.
   5. Unauthorized cutting, breaking, skinning and abrasion of roots, branches.

3.04 ROOT PRUNING

A. During any excavation, no roots larger than 1-inch in diameter will be cut without prior approvals from the Landscape Architect, Arborist and FS Exterior Supervisor.

B. Prune roots that are affected by temporary and permanent construction. Prune roots as follows:
   1. Cut roots manually by digging a trench and cutting exposed roots with clean, sharp pruning instruments; do not break, tear, chop, or slant the cuts. Do not use a backhoe or other equipment that abrades, rips, tears, or pulls roots.
   2. Many plant authorities do not consider it beneficial to paint cut root ends.
   3. Cut Ends: Do not paint cut root ends. Coat cut ends of roots more than 1-1/2 inches in diameter with an emulsified asphalt or other coating formulated for use on damaged plant tissues and that is acceptable to arborist.
   4. Temporarily support and protect roots from damage until they are permanently redirected and covered with soil.
   5. Cover exposed roots with burlap and water regularly. Exposed roots shall be kept moist and protected from sun and frost at all times.
   6. Backfill as soon as possible according to requirements in Division 31 Section - Earth Moving.

C. Root Pruning at Edge of Protection Zone: Prune roots 12 inches outside of the protection zone, by cleanly cutting all roots to the depth of the required excavation.

D. Root Pruning within Protection Zone: Clear and excavate by hand to the depth of the required excavation to minimize damage to root systems. Use narrow-tine spading forks, comb soil to expose roots, and cleanly cut roots as close to excavation as possible.

3.05 CROWN PRUNING

A. Trimming of tree canopies will not be allowed without prior FS Exterior Supervisor approval.

B. Prune branches that are affected by temporary and permanent construction. Prune branches as follows:
   1. Prune trees according to recommendations from Arborist.
   2. Prune trees to remain to compensate for root loss caused by damaging or cutting root system. Provide subsequent maintenance during Contract period as recommended by arborist.
      a. Type of Pruning: Cleaning and Thinning.
      b. Cut branches with sharp pruning instruments; do not break or chop.
      c. Do not apply pruning paint to wounds.
   
C. Chip removed branches and dispose of off-site.
3.06 FIELD QUALITY CONTROL
   A. Inspections: Engage a qualified arborist to direct plant-protection measures in the vicinity of trees, shrubs, and other vegetation indicated to remain and to prepare inspection reports.

3.07 REPAIR AND REPLACEMENT
   A. General: Repair or replace trees, shrubs, and other vegetation indicated to remain or be relocated that are damaged by construction operations, in a manner approved by Architect.
      1. Submit details of proposed root cutting and tree and shrub repairs.
      2. Have arborist perform the root cutting, branch pruning, and damage repair of trees and shrubs.
      3. Treat damaged trunks, limbs, and roots according to arborist's written instructions.
      4. Perform repairs within 24 hours.
      5. Replace vegetation that cannot be repaired and restored to full-growth status, as determined by Architect.
   B. Trees: Remove and replace trees indicated to remain that are more than 25 percent dead or in an unhealthy condition before the end of the corrections period or are damaged during construction operations that Architect determines are incapable of restoring to normal growth pattern.
      1. Provide new trees of same size and species as those being replaced for each tree that measures 6 inches or smaller in caliper size.
      2. Provide two new trees of 4-inch caliper size for each tree being replaced that measures more than 6 inches in caliper size.
         a. Species: Match existing.
         b. Plant and maintain new trees as specified in Division 32 Section "Plants."
   C. Damages to any trees that are to remain and protected:
      1. Tree values will be assessed by the Landscape Architect and FS Exterior Supervisor in one of two ways:
         a. Establish value per ISA standards and posted to the tree at start of construction. Compensation of any and all harm, damage, destruction, etc. to the tree will be assessed based on the tree value. OR
         b. Five Hundred dollar ($500.00) fine per tree, per incident, for violation of these requirements.
      2. Damages may be waived only by Landscape Architect and FS Exterior Supervisor if the tree is replaced with the like species and size and has a full one year unconditional guarantee.

3.08 TREE REMOVAL
   A. Tree Removal: See Section 31 10 00.

3.09 DISPOSAL OF SURPLUS AND WASTE MATERIALS
   A. Disposal: Remove excess excavated material, displaced trees, trash and debris, and legally dispose of them off Owner's property; see Section 01 74 19
      1. Separate recyclable materials produced during work of this section from other nonrecyclable materials. Store or stockpile without intermixing with other materials and transport them to recycling facilities.

END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES

A. General product requirements.
B. Re-use of existing products.
C. Transportation, handling, storage and protection.
D. Product option requirements.
E. Substitution limitations and procedures.
F. Procedures for Owner-supplied products.
G. Maintenance materials, including extra materials, spare parts, tools, and software.

1.02 DEFINITIONS

A. Products: Items purchased for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
B. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature, that is current as of date of the Contract Documents.
C. New Products: Items that have not previously been incorporated into another project or facility, except that products consisting of recycled-content materials are allowed, unless explicitly stated otherwise. Products salvaged or reused from other projects are not considered new products.
D. Comparable Product: Product that is demonstrated and approved through submittal process, or where indicated as a product substitution, to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.
E. Substitutions: Contractor proposed changes in products, materials, equipment, or methods of construction different from those required by the Contract Documents.
F. VOC: Volatile organic compound, carbon compounds that participate in atmospheric photochemical reactions and vaporize at normal room temperature. Measure as grams per liter, less water.
G. Bidding/ Negotiating Period: The period within the project schedule where the Contractor receives bids or pricing from subcontracts or prepares their own bid to establish a contract value with the Owner.
H. Award of Contract: The formal acceptance of the terms of the negotiation by the Contractor.
I. Notice to Proceed: A document that establishes the date work is authorized to commence. It may also include the number of calendar days or date of substantial completion.

1.03 SUBMITTALS

A. Submittal procedure for Product Data, Shop Drawings, Samples, and Certificates is specified in Section 01 33 00 - Submittal Procedure.
B. Proposed Products List: Submit list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.
   1. Submit within 15 days after date of Notice to Proceed.
   2. For products specified only by reference standards, list applicable reference standards.
C. Indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.
D. Request for Substitution: Submit approved form with supporting information to CM/GC. Comply with "Substitution Procedures" Article in this Section.
   1. Requests During Bidding/ Negotiating period: CSI Form 1.5C or current CSI Northwest Region Form.
2. Requests after Bidding/Negotiating period: CSI Form 13.1A.
3. Submit original request forms in quantity required distribution. Original must be signed by person authorized to certify the substitution request form. Architect may request proof of authorization.

1.04 QUALITY ASSURANCE
   A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, product selected shall be compatible with products previously selected, even if previously selected products were also options.

1.05 DELIVERY, STORAGE, AND HANDLING
   A. Construction deliveries shall be made at the project jobsite to the attention of the Contractor; not FS receiving.
   B. Products and materials shall be protected from damage, weather, vandalism, etc. prior to installation. Replacement and replacement cost will be the responsibility of the Contractor.

1.06 PRODUCT WARRANTIES
   A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer’s disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.
      1. Manufacturer’s Warranty: Preprinted written warranty published by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
      2. Special Warranty: Written warranty required by or incorporated into the Contract Documents, either to extend time limit provided by manufacturer’s warranty or to provide more rights for Owner.
   B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution. Submit a draft for approval before final execution.
      1. Manufacturer’s Standard Form: Modified to include Project-specific information and properly executed.
      2. Specified Form: When specified forms are included with the Specifications, prepare a written document using appropriate form properly executed.
      3. Refer to Divisions 2 through 16 Sections for specific content requirements and particular requirements for submitting special warranties.

PART 2 PRODUCTS
2.01 EXISTING PRODUCTS
   A. Do not use materials and equipment removed from existing premises unless specifically required or permitted by the Contract Documents.
   B. Existing materials and equipment indicated to be removed, but not to be re-used, relocated, reinstalled, delivered to the Owner, or otherwise indicated as to remain the property of the Owner, become the property of the Contractor; remove from site.
   C. Reused Products: Reused products include materials and equipment salvaged and refurbished as specified.
      1. Protect, repair and prepare for installation items indicated as “reinstall” or “salvage for reinstallation’.
      2. Replace items that are damaged beyond repair during demolition or construction.

2.02 NEW PRODUCTS
   A. Provide new products unless specifically required or permitted by the Contract Documents.
   B. Provide commercial grade products as a minimum; residential grade products are unacceptable.
   C. Do not use products having any of the following characteristics:
      1. Made using or containing CFC's or HCFC's.
      2. Made of wood from newly cut old growth timber.
D. Where all other criteria are met, Contractor shall give preference to products that:
   1. Are extracted, harvested, and/or manufactured within 500 miles of the project.
   2. Are made with rapidly renewable material.
   3. Contain more recycled material.
   4. Use sustainably harvested wood over non-sustainably harvested wood.
   5. Do not contain urea formaldehyde.
   6. Contain fewer VOCs.
   7. Are Green Label Plus carpet, cushion or adhesive.
   8. Have longer documented life span under normal use.
   9. Result in less construction waste.

E. Products with Rapidly Renewable Material Content:
   1. Definition: Materials made from plants that are typically harvested within 10 years or less after planting.
   2. Overall Project Requirement: Provide materials amounting to a minimum of 2.5 percent of the total value of all materials and products used on the project.
   3. Specific Product Categories: Provide renewable material content as specified elsewhere.
   4. Calculations: Where information about renewable material content is required to be submitted and an item is not made completely of rapidly renewable material, calculate content by dividing the renewable material content by weight by the total weight of the item.
   5. Submittals: State unit cost, renewable material content percentage, quantity installed, total material cost, and total renewable material value; attach evidence of contents from either manufacturer or an independent agency.

F. Products with Recycled Content:
   1. Overall Project Requirement: Provide products with recycled content such that the sum of post-consumer recycled content plus one-half of the post-industrial recycled content constitutes at least 10 percent of the total value of all products installed, except mechanical and electrical components.
      a. This provision is applicable to LEED Credit MR 4; show quantity and calculations on LEED report.
   2. Specific Product Categories: Provide recycled content as specified elsewhere.
   3. Calculations: Where information about recycled content is required to be submitted:
      a. Determine percentage of post-consumer and post-industrial content separately, using the guidelines contained in 16 CFR 260.7(e).
      b. Previously used, reused, refurbished, and salvaged products are not considered recycled.
      c. Wood fabricated from timber abandoned in transit to original mill is considered reused, not recycled.
      d. Determine percentage of recycled content of any item by dividing the weight of recycled content in the item by the total weight of all material in the item.
      e. Determine value of recycled content of each item separately, by multiplying the content percentage by the value of the item.
   4. Submittals: State unit cost, post-consumer and post-industrial content percentages, quantity installed, total material cost, and total recycled content value; attach evidence of contents from either manufacturer or an independent agency.

G. Certified Wood - Sustainably Harvested Wood:
   1. Definition: Wood-based materials include but are not limited to structural framing, dimension lumber, flooring, wood doors, finishes, and furnishings that are permanently installed in the project. Wood and wood-based products not permanently installed in the project are not included in the definition.
   2. Overall Project Requirement: Provide a minimum of 50 percent of all wood-based materials made of sustainably harvested wood.
      a. This provision is applicable to LEED Credit MR 6/7; show quantity on LEED report and submit certificates.
PRODUCT REQUIREMENTS

3. Specific Wood-Based Fabrications: Fabricate of sustainably harvested wood when so specified elsewhere.

4. Certification: Provide wood certified or labeled by an organization accredited by one of the following:

5. Submittals: State unit cost of each wood-based item, quantity installed, quantity certified as sustainably harvested, total wood-based material cost, and total sustainably harvested value; provide letter of certification signed by supplier of each item, indicating compliance with the specified requirements and identifying the certifying organization.
   a. Provide chain-of-custody documentation:
   b. Include the certifying organization's certification numbers for each certified product, itemized on a line-item basis.
   c. Attach copies of invoices bearing the certifying organization's certification numbers.

H. Urea-Formaldehyde Prohibition:
   1. Overall Project Requirement: Provide composite wood and agrifiber products having no added urea-formaldehyde resins. Laminating adhesives used to fabricate both on-site and shop-applied composite wood and agrifiber assemblies shall not contain urea formaldehyde resin.
      a. This provision is applicable to LEED Credit EQ 4.4; submit LEED Prohibited Content Installer Certification Forms.
   b. Require each installer to certify compliance and submit product data showing product content.
   2. Specific Product Categories: Comply with limitations specified elsewhere.

I. Adhesives and Sealants: Provide only products having lower volatile organic compound (VOC) content than required by South Coast Air Quality Management District Rule No.1168, and Green Seal Standard for Commercial Adhesives GS-36.
   1. This provision is applicable to LEED Credit EQ 4.1.
      a. Require each installer to certify compliance and submit product data showing product content.
   2. Specific Product Categories: VOC in grams/Liter shall not exceed:
      a. Indoor Carpet Adhesive: 50.
      b. Carpet Pad Adhesive: 50.
      c. Wood Flooring Adhesive: 100.
      d. Rubber Flooring Adhesive: 60.
      e. Subfloor Adhesive: 50.
      g. VCT and Asphalt Adhesive: 50.
      h. Gypsum Board Adhesive: 50.
      i. Resilient Base Adhesive: 50.
      j. Multipurpose Construction Adhesive: 70.
      k. Structural Glazing Adhesive: 100.
   3. Specialty Applications: VOC in grams/Liter shall not exceed:
      a. PVC Welding: 510.
      b. CPVC Welding: 490.
      c. ABS Welding: 325.
      e. Adhesive Primer for Plastic: 550.
      f. Contact Adhesive: 80.
      g. Special Purpose Contact Adhesive: 250.
      h. Structural Wood Member Adhesive: 140
      j. Top and Trim Adhesive: 250.
   4. Substrate Specific Applications: VOC in grams/Liter shall not exceed:
PRODUCT REQUIREMENTS

a. Metal to Metal: 30.
d. Wood: 30.
e. Fiberglass: 80.

5. Sealants: VOC in grams/Liter shall not exceed:
   b. Roof: 300.
   e. Other: 250.

6. Primers for Sealants: VOC in grams/Liter shall not exceed:
   c. Other: 750.

7. Aerosol Adhesives: Percent VOC by weight shall not exceed:
   a. General Purpose Mist Spray: 65%.
   b. General Purpose Web Spray: 55%.
   c. Special Purpose (all types): 70%.

J. Interior Paints and Coatings: Provide only products having lower volatile organic compound (VOC) content than required by Green Seal Standards GS-11 and GC-03, SCAQMB Rule 1113, in grams/Liter as follows:
   1. This provision is applicable to LEED Credit EQ 4.2.
      a. Require each installer to certify compliance and submit product data showing product content.
   2. VOC in grams/Liter shall not exceed the following for each product:
      b. Flat opaque products: 50.
      c. Anti-corrosive paint: 250.
      d. Floor coating: 100.
      e. Clear varnish: 350.
      g. Sealer: 250.
      h. Other sealers: 200.
      i. Stains: 250.
      j. Lacquer: Not allowed.
   3. Comply with other requirements of GS-11 (component limitations, scrubbability, hiding power, washability).

K. Carpet, Carpet Tile, Carpet Cushion and Adhesives: Provide only products having lower volatile organic compound (VOC) content than required by Carpet and Rug Institute Green Label Plus Testing Program Limits, Emission Factor Limit in mg/sq. m. x hour as follows:
   1. Total Carpet or Carpet Tile VOC: 0.50
      a. 4-Phenylcyclohexene: 0.05
      b. Formaldehyde: 0.05
      c. Styrene: 0.40
      d. Green Label Plus testing for Acetaldehyde, Benzene, Caprolactam, 2-Ethylhexanoic Acid, Formaldehyde, 1-Methyl-2-Pyrrolidinone, Naphthalene, Nonanal, Octanal, 4-Phenylcyclohexene, Styrene, Toluene, and Vinyl Acetate.
   2. Total Adhesive VOC: 10.00
      a. Formaldehyde: 0.05
      b. 2-Ethyl-1-Hexanol: 3.00
   3. Total Cushion VOC: 1.00
      a. 4-Phenylcyclohexene: 0.05
      b. Formaldehyde: 0.05
c. BHT (butylated hydroxytoluene): 0.30
4. This provision is applicable to LEED Credit EQ 4.3. Require each installer to certify compliance and submit product data showing product content.

L. Provide interchangeable components of the same manufacture for components being replaced.
M. Wiring Terminations: Provide terminal lugs to match branch circuit conductor quantities, sizes, and materials indicated. Size terminal lugs to NFPA 70, include lugs for terminal box.
N. Cord and Plug: Provide minimum 6 foot cord and plug including grounding connector for connection to electric wiring system. Cord of longer length is specified in individual specification sections.

2.03 PRODUCT OPTIONS
A. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.
B. Products Specified by Naming One or More Manufacturers: Use a product of one of the manufacturers named and meeting specifications, no options or substitutions allowed.
C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.
D. Basis-of-Design Product: Where Specifications name a product and include a list of manufacturers, provide the specified product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named.
E. Visual Matching Specification: Where Specifications require matching an established Sample, select a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.
   1. If no product available within specified category matches and complies with other specified requirements, comply with provisions in "Product Substitutions" Article for proposal of product.
F. Visual Selection Specification: Selection of products for color, pattern, density, or texture will be by Architect from Manufacturer's full range, unless indicated otherwise.
   1. Standard Range: Where Specifications include the phrase "standard range of colors, patterns, textures" or similar phrase, Architect will select color, pattern, density, or texture from manufacturer's product line that does not include premium items.
   2. Full Range: Where Specifications include the phrase "full range of colors, patterns, textures" or similar phrase, Architect will select color, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

2.04 MAINTENANCE MATERIALS
A. Furnish maintenance/overstock/extra materials, spare parts, tools, and software of types and in quantities specified in individual specification sections.
B. Specific construction overstock requirements are stated in each section as applicable.
C. Overstock goods shall be from the same manufacturer, lot and/or run as the material installed.
D. Provide complete written inventory of overstock goods in Excel format indicating product type, model number, installed location(s), name of supplier, quantity supplied, and storage location. Inventory shall be confirmed prior to issuance of Substantial Completion.
E. Deliver to Project site; obtain receipt prior to final payment.

PART 3 EXECUTION
3.01 SUBSTITUTION PROCEDURES
A. Instructions to Bidders specify time restrictions for submitting requests for substitutions during the bidding period. Comply with requirements specified in this section.
B. Substitutions may be considered during construction when a product becomes unavailable through no fault of the Contractor.
C. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents.
   1. Note any departures from the Contract Documents or changes in previously reviewed submittals which were not commented upon in the initial review of information.

D. A request for substitution constitutes a representation that the submitter:
   1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product.
   2. Will provide the same warranty for the substitution as for the specified product.
   3. Will coordinate installation and make changes to other Work that may be required for the Work to be complete with no additional cost to Owner.
   4. Waives claims for additional costs or time extension that may subsequently become apparent.
   5. Where "visual matching" is not possible, paragraph 2.3E.
   6. Will reimburse Owner and Architect for review or redesign services associated with re-approval by authorities.
   7. Will reimburse the Architect for changes to the building design, including engineering design, detailing and additional Construction Administration services as a result of the proposed substitution.

E. Conditions for Substitution after Bidding/ Negotiating Period: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
   1. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
   2. Requested substitution does not require revisions to the Contract Documents.
   3. Requested substitution is consistent with the Contract Documents and will produce indicated results including warranty, maintenance service or source replacement of parts.
   4. Requested substitution will not adversely affect Contractor's Construction Schedule or the work of other trades.
   5. Requested substitution will not require changing specifications or affect the Owner's activities.
   6. Requested substitution has received necessary approvals of authorities having jurisdiction.
   7. Requested substitution is compatible with other portions of the Work.
   8. Requested substitution has been coordinated with other portions of the Work.
   9. The Contractor agrees to reschedule activities around the required redesign time needed without changing Substantial Completion date and reimburse Architect for changes to the building design, including design, detailing and additional Construction Administration services as a result of the proposed substitution.

F. Substitutions will not be considered when they are indicated or implied on Shop Drawing or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.
   1. Submit proposed substitution 14 days prior to submittal.

G. Substitution Submittal Procedure:
   1. Submit three copies of request for substitution for consideration. Limit each request to one proposed substitution.
   2. Submit shop drawings, product data, and certified test results attesting to the proposed product equivalence. Burden of proof is on proposer.
   4. Requests after Bidding/ Negotiating Period: Architect will notify Contractor in writing of decision to accept or reject request.
3.02 OWNER-FURNISHED PRODUCTS (CONTRACTOR INSTALLED)

A. Owner's Responsibilities:
   1. Arrange for and deliver Owner reviewed shop drawings, product data, and samples, to Contractor.
   2. Arrange and pay for product delivery to site.
   3. On delivery, inspect products jointly with Contractor.
   4. Submit claims for transportation damage and replace damaged, defective, or deficient items.
   5. Arrange for manufacturers' warranties, inspections, and service.

B. Contractor's Responsibilities:
   1. Review Owner reviewed shop drawings, product data, and samples.
   2. Receive and unload products at site; inspect for completeness or damage jointly with Owner.
   3. Handle, store, install and finish products.
   4. Repair or replace items damaged after receipt.

3.03 TRANSPORTATION AND HANDLING

A. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.

B. Transport and handle products in accordance with manufacturer's instructions.

C. Transport materials in a manner to prevent contamination of product and littering of surrounding areas.

D. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.

E. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.

F. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

3.04 STORAGE AND PROTECTION

A. Designate receiving/storage areas for incoming products so that they are delivered according to installation schedule and placed convenient to work area in order to minimize waste due to excessive materials handling and misapplication.

B. Store and protect products in accordance with manufacturers' instructions.

C. Store with seals and labels intact and legible.

D. Store sensitive products in weather tight, climate controlled, enclosures in an environment favorable to product.

E. For exterior storage of fabricated products, place on sloped supports above ground.

F. Provide bonded off-site storage and protection when site does not permit on-site storage or protection.

G. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.

H. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.

I. Prevent contact with material that may cause corrosion, discoloration, or staining.

J. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.

K. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.
L. Installed products and materials shall be protected from damage, weather, vandalism, etc. prior to Final Completion. Replacement and replacement cost will be Contractor's responsibility.

END OF SECTION
# SUBSTITUTION REQUEST

**(After the Bidding/Negotiating Stage)**

<table>
<thead>
<tr>
<th>Field</th>
<th>Information</th>
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<tbody>
<tr>
<td>Project</td>
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<tr>
<td>Substitution Request Number</td>
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<td>From</td>
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<td>A/E Project Number</td>
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<td>Contract For</td>
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<td>Specification Title</td>
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<td>Description</td>
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<tr>
<td>Article/Paragraph</td>
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<tr>
<td>Proposed Substitution</td>
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<td>Manufacturer</td>
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<td>Address</td>
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<td>Phone</td>
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<tr>
<td>Trade Name</td>
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<td>Model No.</td>
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<td>Installer</td>
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<td>Address</td>
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<tr>
<td>Phone</td>
<td>____________________</td>
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<tr>
<td>History</td>
<td>□ New product □ 1-4 years old □ 5-10 years old □ More than 10 years old</td>
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<tr>
<td>Differences between proposed substitution and specified product:</td>
<td>___________________________________________</td>
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<tr>
<td>□ Point-by-point comparative data attached — REQUIRED BY A/E</td>
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<tr>
<td>Reason for not providing specified item:</td>
<td>___________________________________________</td>
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<tr>
<td>Similar Installation:</td>
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<td>Project</td>
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<td>Architect</td>
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<td>Address</td>
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<tr>
<td>Owner</td>
<td>____________________</td>
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<tr>
<td>Date Installed:</td>
<td>____________________</td>
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<tr>
<td>Proposed substitution affects other parts of Work: □ No □ Yes; explain</td>
<td>____________________</td>
</tr>
<tr>
<td>Savings to Owner for accepting substitution:</td>
<td>____________________</td>
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<tr>
<td>Proposed substitution changes Contract Time: □ No □ Yes [Add] [Deduct]</td>
<td>____________________</td>
</tr>
<tr>
<td>Supporting Data Attached:</td>
<td>□ Drawings □ Product Data □ Samples □ Tests □ Reports □</td>
</tr>
</tbody>
</table>
The Undersigned certifies:

• Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
• Same warranty will be furnished for proposed substitution as for specified product.
• Same maintenance service and source of replacement parts, as applicable, is available.
• Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
• Cost data as stated above is complete. Claims for additional costs related to accepted substitution which may subsequently become apparent are to be waived.
• Proposed substitution does not affect dimensions and functional clearances.
• Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the substitution.
• Coordination, installation, and changes in the Work as necessary for accepted substitution will be complete in all respects.

Submitted by: ____________________________

Signed by: ________________________________

Firm:

Address: ________________________________________________________________

Telephone: ________________________________

Attachments: __________________________________________________________________

____________________________________________________________________________

____________________________________________________________________________

____________________________________________________________________________

A/E’s REVIEW AND ACTION

□ Substitution approved – Make submittals in accordance with Specifications Section 01 60 00 Product Requirements.
□ Substitution approved as noted – Make submittals in accordance with Specification Section 01 60 00 Product Requirements.
□ Substitution rejected – Use specified materials.
□ Substitution Request received too late – Use specified materials.

Signed by: ________________________________ Date: ________________________________

Additional Comments: □ Contractor □ Subcontractor □ Supplier □ Manufacturer □ A/E □ ☐

____________________________________________________________________________

____________________________________________________________________________

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____________________________________________________________________________
PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Examination, preparation, and general installation procedures.
   B. Cutting and patching.
   C. Laying out the work.
   D. Cleaning and protection.
   E. Starting of systems and equipment.
   F. Demonstration and instruction of Owner personnel.
   G. Closeout procedures, except payment procedures.

1.02 SUBMITTALS
   A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
   B. Cutting and Patching: If not shown in Documents, submitt an RFI in advance of cutting or alteration that affects:
      1. Structural integrity of any element of Project.
      2. Integrity of weather exposed or moisture resistant element.
      3. Efficiency, maintenance, or safety of any operational element.
      5. Work of Owner or separate Contractor.
   C. Substantial Completion Documents: Statement that Project is substantially complete and list of incomplete items (Punch List).
      1. 1 copy.
      2. Other items listed under Substantial Completion in Part 3.
   D. Project Record Documents: Accurately record actual locations of capped and active utilities.

1.03 QUALIFICATIONS
   A. For survey work, employ a land surveyor registered in the State in which the Project is located and acceptable to Architect. Submit evidence of Surveyor's Errors and Omissions insurance coverage in the form of an Insurance Certificate to be kept on file in Contractor's office.

1.04 PROJECT CONDITIONS
   A. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion.
   B. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.
   C. Dust Control: Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere and over adjacent property, as required by Authority Having Jurisdiction (AHJ).
   D. Noise Control: Provide methods, means, and facilities to minimize noise produced by construction operations, as required by Authority Having Jurisdiction (AHJ).
   E. Pest and Rodent Control: Provide methods, means, and facilities to prevent pests and insects from damaging the work.
   F. Rodent Control: Provide methods, means, and facilities to prevent rodents from accessing or invading premises.
   G. Pollution Control: Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations. Comply with federal, state, and local regulations.
1.05 COORDINATION

A. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.

B. Notify affected utility companies and comply with their requirements.

C. Verify that utility requirements and characteristics of new operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.

D. Coordinate space requirements, supports, and installation of mechanical and electrical work that are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

E. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.

F. Coordinate completion and clean-up of work of separate sections.

G. After Owner occupancy of premises, coordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

PART 2 PRODUCTS

2.01 PATCHING MATERIALS

A. New Materials: As specified in product sections; match existing products and work for patching and extending work.

B. Type and Quality of Existing Products: Determine by inspecting and testing products where necessary, referring to existing work as a standard.

C. Product Substitution: For any proposed change in materials, submit request for substitution described in Section 01 60 00.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.

B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.

C. Examine and verify specific conditions described in individual specification sections.

D. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or misfabrication.

E. Verify that utility services are available, of the correct characteristics, and in the correct locations.

F. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

3.02 PREPARATION

A. Clean substrate surfaces prior to applying next material or substance.

B. Seal cracks or openings of substrate prior to applying next material or substance.

C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.
EXECUTION AND CLOSEOUT REQUIREMENTS

3.03 LAYING OUT THE WORK

A. Verify locations of survey control points prior to starting work.
B. Promptly notify Architect of any discrepancies discovered.
C. Protect survey control points prior to starting site work; preserve permanent reference points during construction.
D. Promptly report to Architect the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.
E. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Architect.
F. Utilize recognized engineering survey practices.
G. Establish elevations, lines and levels. Locate and lay out by instrumentation and similar appropriate means:
   1. Site improvements including pavements; stakes for grading, fill and topsoil placement; utility locations, slopes, and invert elevations.
   2. Grid or axis for structures.
   3. Building foundation, column locations, ground floor elevations.
H. Periodically verify layouts by same means.
I. Maintain a complete and accurate log of control and survey work as it progresses.

3.04 GENERAL INSTALLATION REQUIREMENTS

A. Install products as specified in individual sections, in accordance with manufacturer’s instructions and recommendations, and so as to avoid waste due to necessity for replacement.
B. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.
C. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.
D. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.
E. Make neat transitions between different surfaces, maintaining texture and appearance.

3.05 CUTTING AND PATCHING

A. Whenever possible, execute the work by methods that avoid cutting or patching.
B. Perform whatever cutting and patching is necessary to:
   1. Complete the work.
   2. Fit products together to integrate with other work.
   3. Provide openings for penetration of mechanical, electrical, and other services.
   4. Match work that has been cut to adjacent work.
   5. Repair areas adjacent to cuts to required condition.
   6. Repair new work damaged by subsequent work.
   7. Remove samples of installed work for testing when requested.
   8. Remove and replace defective and non-conforming work.
C. Execute cutting and patching including excavation and fill to complete the work, to uncover work in order to install improperly sequenced work, to remove and replace defective or non-conforming work, to remove samples of installed work for testing when requested, to provide openings in the work for penetration of mechanical and electrical work, to execute patching to complement adjacent work, and to fit products together to integrate with other work.
D. Execute work by methods that avoid damage to other work and that will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.
E. Employ original installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.
F. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.
   1. Do not overcut at corners of masonry, concrete, metals and similar rigid materials.

G. Restore work with new products in accordance with requirements of Contract Documents.

H. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

I. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material in accordance with Section 07 84 00, to full thickness of the penetrated element.

J. Patching:
   1. Finish patched surfaces to match finish that existed prior to patching. On continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
   2. Match color, texture, and appearance.
   3. Repair patched surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. If defects are due to condition of substrate, repair substrate prior to repairing finish.

K. Refinish surfaces to match adjacent finish. For continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.

L. Make neat transitions. Patch work to match adjacent work in texture and appearance. Where new work abuts or aligns with existing, perform a smooth and even transition.

3.06 PROGRESS CLEANING

A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.

B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.

C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.

D. Collect and remove waste materials, debris, and trash/rubbish from site periodically and dispose off-site; do not burn or bury.

E. Daily Cleaning Requirements:
   1. Collect waste material which may constitute a fire hazard, place in closed metal containers, and remove daily from site.
   2. After cutting and boring, contractor is required to clean the space of all debris, water and concrete.
   3. Keep the premises free from accumulation of debris.
   4. Remove all debris, equipment, surplus materials and leave the premises in a neat and orderly condition at the completion of the work day.
   5. Clean all walks, streets, etc. affected by the work.

3.07 PROTECTION OF INSTALLED WORK

A. Protect installed work from damage by construction operations.

B. Provide special protection where specified in individual specification sections.

C. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.

D. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.

E. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.

F. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.
G. Remove protective coverings when no longer needed; reuse or recycle plastic coverings if possible.

3.08 SYSTEM STARTUP
A. Coordinate schedule for start-up of various equipment and systems.
B. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions that may cause damage.
C. Verify tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.
D. Verify that wiring and support components for equipment are complete and tested.
E. Execute start-up under supervision of applicable Contractor personnel and manufacturer’s representative in accordance with manufacturers’ instructions.
F. Submit a written report that equipment or system has been properly installed and is functioning correctly.

3.09 DEMONSTRATION AND INSTRUCTION
A. Demonstrate operation and maintenance of products to Owner's personnel two weeks prior to date of Substantial Completion.
B. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at scheduled time, at equipment location.
   1. Training & demonstration session of overview for all trades and response groups.
   2. In depth training and demonstration session for maintenance, technician, and service personnel. shall be to a maintenance technician, and/or service levels for all systems.
   3. Required hours will be listed in following standards.
C. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.
D. Provide a qualified person who is knowledgeable about the Project to perform demonstration and instruction of owner personnel.
E. Utilize operation and maintenance manuals as basis for instruction. Review contents of manual with Owner's personnel in detail to explain all aspects of operation and maintenance.
F. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.

3.10 ADJUSTING
A. Adjust operating products and equipment to ensure smooth and unhindered operation.

3.11 FINAL CLEANING
A. Execute final cleaning prior to Substantial Completion.
B. Use cleaning materials that are nonhazardous and will not damage the Work.
C. Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.
D. Remove all labels that are not permanent. Do not paint or otherwise cover fire test labels or nameplates on mechanical and electrical equipment.
E. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.
F. Clean filters of operating equipment.
G. Clean debris from roofs, gutters, downspouts, and drainage systems.
H. Clean site; sweep paved areas, rake clean landscaped surfaces.
I. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury.
J. See also Divisions 31 and 32 for landscape restoration requirements.

K. Special cleaning for specific work may be noted in following sections of this document.

L. Comply with manufacturer’s instructions for cleaning of all system components, equipment, and materials installed into the project.

M. Prior to the time the Contractor requests Substantial Completion Inspection:
   1. Remove labels that are not required as permanent labels.
   2. Clean exposed hard-surfaced finishes including glass, metals, stone, concrete, painted surfaces, plastics, tile, wood, special coatings, and similar surfaces, to a dirt free condition, free of dust, stains, films, and similar noticeable distracting substances.
   4. Clean lighting fixtures and lamps of all dust and debris.
   5. Remove crates, cartons, and other flammable waste materials or trash from work areas. Building(s) shall be turned over free of concealed garbage, trash, and rodent infestation. If any of the preceding is revealed, or odors from them occur, they shall be removed by the Contractor at Contractor’s expense.
   6. Restore all surrounding property to its original condition.
   7. Elevator shafts, electric closets, pipe, and duct shafts, chases, furred spaces, and similar spaces which are generally unfurnished, shall be cleaned and left free from rubbish, loose plaster, mortar drippings, extraneous construction materials, dirt, and dust.
   8. Rubbish and debris shall be lowered by way of chutes, hoists, or lowered in receptacles. Under no circumstances shall any rubbish or waste be dropped or thrown from one level to another within or outside the building(s).
   9. No marking, soiling, or other defacing of finished surfaces. In the event that finished surfaces become defaced, all costs for cleaning and restoring such surfaces to their originally intended condition shall be the responsibility and cost of the Contractor.
   10. Remove debris from and clean tops of all equipment, AHU, lights, etc. This includes mechanical rooms.

N. Prior to Contractor request of Final Acceptance Inspection:
   1. Clean transparent materials, including mirrors and window or door glass, to a polished condition, removing substances that are noticeable as vision-obscuring materials.
   2. Turn the work over in immaculate condition inside and outside including the premises.
   3. Clean all work on the premises including walks, drives, curbs, paving, fences, grounds, and walls. Slick surfaces shall be left with a clear shine. Cleanup shall include removal of smudges, marks, stains, fingerprints, soil, dirt, paint, dust, lint, labels, discolorations, and other foreign materials.
   4. Clean all finished surfaces on interior and exterior of project including floors, walls, ceilings, windows, glass, doors, fixtures, hardware, and equipment.
   5. Clean and apply finish (including ‘Anchor’ wax) to all floors as recommended by the manufacturer.
   6. Wash exterior glass using a window-cleaning contractor specializing in such work.
   7. Remove temporary buildings and structures, fences, scaffolding, surplus materials, and rubbish of every kind from the site of the work. Repair these areas to be compatible with the surrounding finished conditions.
   8. Clean tops of all equipment, AHU, lights, etc. This includes mechanical rooms.
   9. Construction Waste Management, see Section 01 74 19.

3.12 CLOSEOUT PROCEDURES
A. Make submittals that are required by governing or other authorities.
   1. Provide copies to Architect.
B. Notify Architect when work is considered ready for Substantial Completion.
C. Substantial Completion: Submit written statement that Contract Documents have been reviewed, work has been inspected, and that work is complete in accordance with Contract Documents and ready for Architect’s review.
EXECUTION AND CLOSEOUT REQUIREMENTS

1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
   a. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor.
   b. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
   c. Include the following information at the top of each page: Project name; Date; Name of Architect; Name of Contractor; Page number.
2. Advise Owner of pending insurance changeover requirements.
3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
5. Prepare and submit Project Record Documents, operation and maintenance manuals, Final Completion construction digital photographs, damage or settlement surveys, property surveys, and similar final record information.
6. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
7. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
8. Complete startup testing of systems.
10. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
11. Advise Owner of changeover in heat and other utilities.
12. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
13. Complete final cleaning requirements, including touchup painting.
14. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

D. Certificate of Substantial Completion: On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.
   1. Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.
   2. Re-inspection is Extraordinary Contract Administration Service, Section 01 20 00.
   3. Results of completed inspection will form the basis of requirement for Final Completion.

E. Correct items of work listed in executed Certificates of Substantial Completion and comply with requirements for access to Owner-occupied areas.

F. Notify Architect when work is ready for Final Completion.
   1. Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
   2. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
   3. Submit pest-control final inspection report and warranty.
   4. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.
   5. Submit demonstration and training videotapes.
G. Final Completion: On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will certify a final Certificate for Payment after inspection or will notify Contractor of work that must be completed or corrected before certificate will be issued.

H. Complete items of work determined by Architect's final inspection.
   1. Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.
   2. Re-inspection is Extraordinary Contract Administration Service, Section 01 20 00.

END OF SECTION
PART 1 GENERAL

1.01 WASTE MANAGEMENT REQUIREMENTS

A. Owner requires that this project generate the least amount of trash and waste possible.
B. Salvage and Recycling Requirements: Our goal is to salvage and recycle as much non-hazardous demolition and construction waste as possible including any demolition and/or construction waste.
C. Employ processes that ensure the generation of as little waste as possible due to error, poor planning, breakage, mishandling, contamination, or other factors.
D. Minimize trash/waste disposal in landfills; reuse, salvage, or recycle as much waste as economically feasible.
E. Required Recycling, Salvage, and Reuse: The following may not be disposed of in landfills or by incineration:
   1. Aluminum and plastic beverage containers.
   2. Corrugated cardboard.
   3. Wood pallets.
   4. Clean dimensional wood: May be used as blocking or furring.
   5. Land clearing debris, including brush, branches, logs, and stumps: See Section 31 10 00 for use options.
   6. Concrete: May be crushed and used as riprap, aggregate, sub-base material, or fill.
   7. Bricks: May be used on project if whole, or crushed and used as landscape cover, sub-base material, or fill.
   8. Concrete masonry units: May be used on project if whole, or crushed and used as sub-base material or fill.
   9. Asphalt paving: May be recycled into paving for project.
   10. Metals, including packaging banding, metal studs, sheet metal, structural steel, piping, reinforcing bars, door frames, and other items made of steel, iron, galvanized steel, stainless steel, aluminum, copper, zinc, lead, brass, and bronze.
   11. Glass.
   12. Gypsum drywall and plaster.
   14. Carpet, carpet cushion, carpet tile, and carpet remnants, both new and removed: DuPont (http://flooring.dupont.com) and Interface (www.interfaceinc.com) conduct reclamation programs.
   15. Asphalt roofing shingles.
   16. Paint.
   17. Plastic sheeting.
   18. Rigid foam insulation.
   19. Windows, doors, and door hardware.
   20. Plumbing fixtures.
   21. Mechanical and electrical equipment.
   22. Fluorescent lamps (light bulbs).
   23. Acoustical ceiling tile and panels.
F. Owner requires that 95 percent, by weight, of potential landfill trash/waste is diverted by recycling or salvage.
G. Contractor shall submit periodic Waste Disposal Reports; all landfill disposal, recycling, salvage, and reuse must be reported regardless of to whom the cost or savings accrues; use the same units of measure on all reports.
H. Contractor shall develop and follow a Waste Management Plan designed to implement these requirements.
I. The following sources may be useful in developing the Waste Management Plan:
2. State DEQ Commercial Waste Reduction Clearinghouse, at www.deq.state.or.us/wmc/cwrc.

J. Methods of trash/waste disposal that are not acceptable are:
   1. Burning on the project site.
   2. Burying on the project site.
   3. Dumping or burying on other property, public or private.
   4. Other illegal dumping or burying.
   5. Incineration, either on- or off-site.

K. Regulatory Requirements: Contractor is responsible for knowing and complying with regulatory requirements, including but not limited to Federal, state and local requirements, pertaining to legal disposal of all construction and demolition waste materials.

1.02 RELATED REQUIREMENTS

A. Section 01 30 00 - Administrative Requirements: Additional requirements for project meetings, reports, submittal procedures, and project documentation.

B. Section 01 50 00 - Temporary Facilities and Controls: Additional requirements related to trash/waste collection and removal facilities and services.

C. Section 01 60 00 - Product Requirements: Waste prevention requirements related to delivery, storage, and handling.

D. Section 01 70 00 - Execution and Closeout Requirements: Trash/waste prevention procedures related to demolition, cutting and patching, installation, protection, and cleaning.

E. Section 31 10 00 - Site Clearing: Handling and disposal of land clearing debris.

1.03 DEFINITIONS

A. Clean: Untreated and unpainted; not contaminated with oils, solvents, caulk, or the like.

B. Construction and Demolition Waste: Solid wastes typically including building materials, packaging, trash, debris, and rubble resulting from construction, remodeling, repair and demolition operations.

C. Hazardous: Exhibiting the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity or reactivity.

D. Material Recovery Facility: Waste sorting facility where commingled materials are accepted and recovered for recycling or salvage.

E. Nonhazardous: Exhibiting none of the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity, or reactivity.

F. Nontoxic: Neither immediately poisonous to humans nor poisonous after a long period of exposure.

G. Recyclable: The ability of a product or material to be recovered at the end of its life cycle and remanufactured into a new product for reuse by others.

H. Recycle: To remove a waste material from the project site to another site for remanufacture into a new product for reuse by others.

I. Recycling: The process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for the purpose of using the altered form. Recycling does not include burning, incinerating, or thermally destroying waste.

J. Return: To give back reusable items or unused products to vendors for credit.

K. Reuse: To reuse a construction waste material in some manner on the project site.

L. Salvage: To remove a waste material from the project site to another site for resale or reuse by others.

M. Sediment: Soil and other debris that has been eroded and transported by storm or well production run-off water.
N. Source Separation: The act of keeping different types of waste materials separate beginning from the first time they become waste.

O. Toxic: Poisonous to humans either immediately or after a long period of exposure.

P. Trash: Any product or material unable to be reused, returned, recycled, or salvaged.

Q. Waste: Extra material or material that has reached the end of its useful life in its intended use. Waste includes salvageable, returnable, recyclable, and reusable material.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Recycling Plan: Prior to preparation of the Waste Management Plan, submit the recycling plan to the PM and Architect for approval.

C. Submit Waste Management Plan within 10 calendar days after receipt of Notice of Award of Bid, or prior to any trash or waste removal, whichever occurs sooner; submit projection of all trash and waste that will require disposal and alternatives to landfilling.

D. Waste Management Plan: Include the following information:
   1. Analysis of the trash and waste projected to be generated during the entire project construction cycle, including types and quantities.
   2. Landfill Options: The name, address, and telephone number of the landfill(s) where trash/waste will be disposed of, the applicable landfill tipping fee(s), and the projected cost of disposing of all project trash/waste in the landfill(s).
   3. Landfill Alternatives: List all waste materials that will be diverted from landfills by reuse, salvage, or recycling.
   4. Meetings: Describe regular meetings to be held to address waste prevention, reduction, recycling, salvage, reuse, and disposal.
   5. Materials Handling Procedures: Describe the means by which materials to be diverted from landfills will be protected from contamination and prepared for acceptance by designated facilities; include separation procedures for recyclables, storage, and packaging.
   6. Transportation: Identify the destination and means of transportation of materials to be recycled; i.e. whether materials will be site-segregated and self-hauled to designated centers, or whether mixed materials will be collected by a waste hauler.

E. Waste Disposal Reports: Submit at specified intervals, with details of quantities of trash and waste, means of disposal or reuse, and costs; show both totals to date and since last report.
   1. Submit updated Report with each Application for Progress Payment; failure to submit Report will delay payment.
   2. Submit Report on a form acceptable to Owner.
   3. Landfill Disposal: Include the following information:
      a. Identification of material.
      b. Amount, in tons or cubic yards, of trash/waste material from the project disposed of in landfills.
      c. State the identity of landfills, total amount of tipping fees paid to landfill, and total disposal cost.
      d. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.
      e. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
   4. Recycled and Salvaged Materials: Include the following information for each:
      a. Identification of material, including those retrieved by installer for use on other projects.
      b. Amount, in tons or cubic yards, date removed from the project site, and receiving party.
c. Transportation cost, amount paid or received for the material, and the net total cost or savings of salvage or recycling each material.
d. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.
e. Certification by receiving party that materials will not be disposed of in landfills or by incineration.
f. Waste Reduction Calculations: Before request for Substantial Completion, submit three copies of calculated end-of-Project rates for salvage, recycling, and disposal as a percentage of total waste in weight generated by the Work.
g. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices. Include documentation for back-charge fees (if any) for improperly segregated waste.

5. Material Reused on Project: Include the following information for each:
   a. Identification of material and how it was used in the project.
   b. Amount, in tons or cubic yards.
   c. Include weight tickets as evidence of quantity.

6. Other Disposal Methods: Include information similar to that described above, as appropriate to disposal method.

F. LEED Credit MR 2: Plan and documentation for Construction Waste Management. Comply with Section 01 35 15.

G. Donation Record Keeping: Indicate receipt and acceptance of salvageable waste donated to individuals and organizations. Indicate whether or not the organization is tax exempt.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 WASTE MANAGEMENT PROCEDURES
   A. See Section 01 30 00 for additional requirements for project meetings, reports, submittal procedures, and project documentation.
   B. See Section 01 60 00 for waste prevention requirements related to delivery, storage, and handling.

3.02 WASTE MANAGEMENT PLAN IMPLEMENTATION
   A. Manager: Designate an on-site person or persons responsible for instructing workers and overseeing and documenting results of the Waste Management Plan.
   B. Communication: Distribute copies of the Waste Management Plan to job site foreman, each subcontractor, Owner, and Architect.
   C. Instruction: Provide on-site instruction of appropriate separation, handling, and recycling, salvage, reuse, and return methods to be used by all parties at the appropriate stages of the project.
   D. Meetings: Discuss trash/waste management goals and issues at project meetings.
      1. Pre-bid meeting.
      2. Pre-construction meeting.
      3. Regular job-site meetings.
   E. Facilities: Provide specific facilities for separation and storage of materials for recycling, salvage, reuse, return, and trash disposal, for use by all contractors and installers.
      1. As a minimum, provide:
         a. Separate area for storage of materials to be reused on-site, such as wood cut-offs for blocking.
         b. Separate dumpsters for each category of recyclable.
         c. Recycling bins at worker lunch area.
      2. Label containers and areas with durable, weather-resistant signs. Use clear simple language. Use multiple languages spoken at Project Site.
3. Provide containers as required.
4. Provide adequate space for pick-up and delivery and convenience to subcontractors.
5. Keep recycling and trash/waste bin areas neat and clean and clearly marked in order to avoid contamination of materials.
6. Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
7. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.
8. Comply with project requirements for controlling dust and dirt, environmental protection, and noise control.

F. Alternative to Site Separation: Material Recovery Facility that provides specified documentation is acceptable in lieu of source-separated recycling facilities.

G. Hazardous Wastes: Separate, store, and dispose of hazardous wastes according to applicable regulations.

H. Recycling: Separate, store, protect, and handle at the site identified recyclable waste products in order to prevent contamination of materials and to maximize recyclability of identified materials. Arrange for timely pickups from the site or deliveries to recycling facility in order to prevent contamination of recyclable materials.

I. Reuse of Materials On-Site: Set aside, sort, and protect separated products in preparation for reuse.

J. Salvage: Set aside, sort, and protect products to be salvaged for reuse off-site.

END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES

A. Project Record Documents.
B. Operation and Maintenance Manuals.

1.02 RELATED REQUIREMENTS

A. Section 01 30 00 - Administrative Requirements: Submittals procedures, shop drawings, product data, and samples.
B. Individual Product Sections: Specific requirements for operation and maintenance data.
C. Individual Product Sections: Warranties required for specific products or Work.

1.03 SUBMITTALS

A. Project Record Documents: Submit documents to Architect with claim for final Application for Payment.
B. Operation and Maintenance Data:
   1. Submit one copy of preliminary manual before 75% of Work is complete. Include table of contents, outline contents of each section, and at least one typical finish section complete, and one equipment section complete. Architect will review preliminary and return one copy with comments.
   2. Applications for payment equal to and greater than 75% will not be certified until preliminary manual is submitted.
   3. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit completed documents within ten days after acceptance.
   4. Submit 1 copy of completed documents 15 days prior to Substantial Completion. This copy will be reviewed and returned, with Architect comments. Revise content of all document sets as required prior to final submission.
   5. Submit two sets of revised final documents in final form within 10 days after request for final payment or request for final inspection, whichever is first.
C. Warranties and Bonds:
   1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within 10 days after acceptance.
   2. Make other submittals within 10 days after Date of Substantial Completion, prior to final Application for Payment.
   3. Items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within 10 days after acceptance, listing the date of acceptance as the beginning of the warranty period.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PROJECT RECORD DOCUMENTS

A. Maintain on site one set of the following record documents; record actual revisions to the Work:
   1. Drawings.
   2. Specifications.
   3. Addenda.
   4. Change Orders and other modifications to the Contract.
   5. Reviewed shop drawings, product data, and samples.
B. Ensure entries are complete and accurate, enabling future reference by Owner.
C. Store record documents separate from documents used for construction.
D. Record information concurrent with construction progress.
1. Review current information with Architect prior to each Application for Payment. This is a condition for payment. See Section 01200

E. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
   1. Changes made by Addenda and modifications.

F. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction including:
   1. Measured depths of foundations in relation to finish first floor datum.
   2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
   3. Field changes of dimension and detail.
   4. Details not on original Contract drawings.

G. Commissioning Closeout Documentation: Provide commissioning closeout documentation and/or verification not included in the O&M manuals or as-built documentation.
   1. This information is intended to be a consolidation of documentation and verification for the project commissioning and closeout process.
   2. Include documentation of training of FS personnel regarding operation of particular systems. Such documentation shall include identification of parties receiving training and date(s) of training.

H. General Contractor As-Built document requirements / deliverables at project closeout: With all the following listed items, give particular attention to concealed products and portions of the work that are not clearly identified in the original submittal or cannot otherwise be readily discerned at a later date by direct observation.
   1. Original permit set of documents with sign off of inspections. Contractor should make copies of these sign offs for their records.
   2. 1 complete full-size, reproducible drawing sets on bond paper.
   3. 1 complete set of as-built specifications.
   4. 1 complete reproducible CD of as-built drawings and specifications in ‘pdf’ file format.
   5. 1 complete full-size reproducible drawing & specification set of Contractor’s red-lines on bond paper.
   6. Complete digital set of all construction photographs by Contractor.

3.02 OPERATION AND MAINTENANCE DATA - GENERAL

A. For Each Product or System: List names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.

B. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.

C. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawings.

D. Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

3.03 OPERATION AND MAINTENANCE DATA FOR MATERIALS AND FINISHES

A. For Each Product, Applied Material, and Finish:
   1. Product data, with catalog number, size, composition, and color and texture designations.
   2. Information for re-ordering custom manufactured products.

B. Instructions for Care and Maintenance: Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental cleaning agents and methods, and recommended schedule for cleaning and maintenance.

3.04 OPERATION AND MAINTENANCE DATA FOR EQUIPMENT AND SYSTEMS

A. For Each Item of Equipment and Each System:
   1. Description of unit or system, and component parts.
2. Identify function, normal operating characteristics, and limiting conditions.
3. Include performance curves, with engineering data and tests.
4. Complete nomenclature and model number of replaceable parts.

B. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.

C. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and trouble shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

D. Provide servicing and lubrication schedule, and list of lubricants required.
E. Include manufacturer's printed operation and maintenance instructions.
F. Include sequence of operation by controls manufacturer.
G. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
H. Additional Requirements: As specified in individual product specification sections.

### 3.05 ASSEMBLING OPERATION AND MAINTENANCE MANUALS

A. Prepare instructions and data by personnel experienced in maintenance and operation of described products.
B. Prepare data in the form of an instructional manual.
C. Binders: Commercial quality, 8-1/2 by 11 inch three D side ring binders with durable plastic covers; 2 inch maximum ring size. When multiple binders are used, correlate data into related consistent groupings.
   1. Multiple Volumes: Divide O & M information logically following CSI MasterFormat when more than one binder is necessary.
   2. Subtitle binders by Volume Number and CSI sub group title or CSI division title as appropriate.
D. Cover: Identify each binder with printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of Project; identify Subtitle appropriate for subject matter of contents, Month and Year of Substantial Completion.
E. Table of Contents: Project name on each page; list products and systems included in Volume, indexed by CSI Section number.
F. Information Page: Project name; names, addresses, and telephone numbers of Architect, Consultants, and Contractor with name of responsible parties; date of substantial completion.
G. Index of Products: Table that can be sorted by word processor or spreadsheet; printed and digital formats; include product information under the following column headings:
   1. Product Name
   2. Manufacturer
   3. Model number
   4. O&M Volume Number
   5. Section Number
H. Arrange content by systems under Section numbers and sequence of Table of Contents of this Project Manual.
I. Provide tabbed dividers for each separate product or system, with Specification Section number and product name.
   1. Product Summary: On divider page or a separate first page indicate Specification Section number and title, product or system name, manufacturer, model, major components, supplier and installer information.
J. Text: Manufacturer’s printed or typewritten information on 20 pound paper.
K. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.

L. Elevator Operation and Maintenance Manual: Submit an additional copy of information for elevator in a separate manual, formatted similar to primary manual. This Manual will be kept in Elevator Machine Room.
   1. When Project includes more than one Elevator Machine Room, provide separate manuals with information for elevators served by that machine room.

M. Operation and Maintenance Manuals:
   1. 2 complete physical hard copies of ALL listed items.
   2. 1 complete reproducible CD of ALL listed items in ‘pdf’ file format.
   3. ALL part numbers of manufacturers and suppliers.
   4. Total quantities installed under the contract.
   5. Manufacturer and supplier names and addresses.
   6. Complete manufacturer’s serial number(s) or other identity symbol(s).
   7. Parts lists that clearly identify every part in the item of equipment with the proper manufacturer’s name, part nomenclature and number, local source, and list price.
   8. Draw-downs of all finish paint used.
   9. Recommended Spare Parts:
      a. Furnish a list of recommended spare parts for each equipment item that will be needed to support that item of equipment for a 12-month period.
      b. The quantities of spare parts recommended shall be based upon the quantity of like equipment items installed under the contract.
      c. Storage shelf life of part, in months, if the part has a limited life.
      d. Recommended quantity of part(s) to inventory and support the installed quantity of equipment in which the part appears for a period of 12 months.
      e. Name, address, and phone number of the nearest supplier for the part.
   10. Normal Operating Instructions: Provide sufficient information that will permit a journeyman mechanic to adjust, startup, operate, and shutdown the equipment. Special startup precautions and other action items required before the equipment is put into service must be noted.
   11. Emergency Operating Procedures: Detail description of the sequence of action to be taken in the event of a malfunction, either to permit a short period of continued operation or an emergency shutdown to prevent further damage to the unit and to the system.
   12. Preventative Maintenance: Detail information to cover routine and special inspection requirements, including field adjustments, inspections for wear, adjustment changes, packing wear, lubrication points, frequency and specific lubrication type required, cleaning of the unit, type of solvent to use, and other measures applicable.
   13. Calibration: Detailed data on what to calibrate, how to calibrate, when to calibrate, and procedures to enable checking the equipment for reliability; provide indications and data for test equipment, special tools and the location of test points. n. Scale and Corrosion Control: Detailed information for prevention and removal of scale and corrosion.
   14. Trouble Shooting Procedures: Detailed information and procedures for detecting and isolating malfunctions; provide detailed information concerning probable causes and applicable remedies.
   15. Removal and Installation Instructions: Detailed information concerning the logical sequence of steps required to remove and install the item including instructions for the use of special tools and equipment.
   16. Disassembly and Assembly Instructions: Detailed illustrations and text to show the logical procedure and provide the instructions necessary to disassemble and assemble the unit properly. The text shall include all checks and special precautions and list the use of special tools and equipment required to perform the assembly or disassembly.
   17. Repair Instructions: Detailed repair procedures to bring the equipment up to the required operating standard including instruction for examining equipment and parts for needed
repairs and adjustments, and tests or inspections required to determine whether old parts may be reused or must be replaced.

18. System Drawings: Detailed drawings, where applicable, that clearly show wiring diagrams, control diagrams, system schematics, pneumatic and fluid flow diagrams, etc., which pertain to the unit function. Drawings are required to show modifications to another manufacturer’s standard unit which is incorporated into the assembly or packaged unit.
   a. The Contractor shall provide diagrammatic drawings for each installed system, which shall show the placement of the system in relation to the building, and the physical location of each item or equipment installed within the system. Each installed item of equipment shown on the drawing will be identified by the equipment item model and/or serial/part number.

19. Special Tools and Test Equipment: Furnish a detailed list of the special tools and test equipment needed to perform repair and maintenance for each equipment item. The list shall contain the special tool and test equipment part number, size, quantity, price, manufacturer’s name and address, and local supplier’s name and address.

20. Warranties and Guarantees: Within each tabbed section of the O&M, include an executed copy of the specified warranty/guarantee covering the particular system, equipment item, or material.
   a. This is to include both the manufacturer’s warranty and the installing contractor’s guarantee for workmanship and system operation. This copy of the particular warranty/guarantee is in addition to the original signed copies that are to be bound together separately.
   b. Provide a separate binder containing all original project warranties and guarantees.

21. Field records on excavations, foundations, underground construction, wells, and similar work; if not already included in as-built drawings / documentation.

22. Accurate survey showing locations and elevations of underground lines, including invert elevations of drainage piping; if not already included in as-built drawings / documentation.

23. Surveys establishing lines and levels of buildings; if not already included in as-built drawings / documentation.

24. Load and/or performance testing.

25. Final inspection and deficiency corrections.

26. Prior to date of substantial completion the Architect and PM shall determine which (if any) samples or mock-ups are to be transmitted to the PM for record purposes.

27. With all the above listed items, give particular attention to concealed products and portions of the work that are not clearly identified in the original submittal or cannot otherwise be readily discerned at a later date by direct observation.

3.06 WARRANTIES AND BONDS MANUAL

A. Obtain warranties and bonds, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within 10 days after completion of the applicable item of work. Except for items put into use with Owner’s permission, leave date of beginning of time of warranty until the Date of Substantial completion is determined.

1. Always provide, at a minimum, the responsible Subcontractor’s, supplier’s and manufacturer’s standard product warranty unless noted otherwise in the individual specification sections.

2. All listed manufacturers and all listed installers through the act of submitting a bid are confirming obligatory responsibility for providing an equal quantity and equal quality warranty to the design basis warranties listed, unless individual specification sections note otherwise.

3. Minimum warranty for all material and workmanship, building envelope and penetration components excluded per above noted ORS, for a minimum of 1-year after date of substantial completion OR for the extended period of time determined by manufacturer’s guarantee.

4. Extended warranties may be required for specific items as noted in the following document.
CLOSEOUT SUBMITTALS

5. Correct immediately any failure caused by poor material or workmanship during warranty period; within 72 hours of notice.
6. If the PM or FS personnel are required to proceed with repairs, the responsible party of the warranty will be billed for costs and damages when failing to comply.

B. Verify that documents are in proper form, contain full information, and are notarized.
C. Co-execute submittals when required.
D. Retain warranties and bonds until time specified for submittal.
E. Manual: Bind in commercial quality 8-1/2 by 11 inch three D side ring binders with durable plastic covers.
F. Cover: Identify each binder with typed or printed title WARRANTIES AND BONDS, with title of Project; name, address and telephone number of Contractor and equipment supplier; and name of responsible company principal.
   1. Do not include “And Bonds” when Project does not include bonds.
G. Table of Contents: Neatly typed, in the sequence of the Table of Contents of the Project Manual, with each item identified with the number and title of the specification section in which specified, and the name of product or work item.
H. Separate each warranty or bond with index tab sheets keyed to the Table of Contents listing. Provide full information, using separate typed sheets as necessary. List Subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.

3.07 MAINTENANCE MATERIALS

A. Closeout delivery of any and all closeout and/or overstock items to the PM requires formal transmittals for project records; including O&M manuals, extra materials, custom finish knives, etc.

B. See Section 01 60 00 for additional requirements.

END OF SECTION
PART 1 GENERAL

1.01 SUMMARY

A. Commissioning is intended to achieve the following specific objectives; this section specifies the Contractor's responsibilities for commissioning:
   1. Verify that the work is installed in accordance with the Contract Documents and the manufacturer's recommendations and instructions, and that it receives adequate operational checkout prior to startup: Startup reports and Prefunctional Checklists executed by Contractor are utilized to achieve this.
   2. Verify and document that functional performance is in accordance with the Contract Documents: Functional Tests executed by Contractor and witnessed by the Commissioning Authority are utilized to achieve this.
   3. Verify that operation and maintenance manuals submitted to Owner are complete: Detailed operation and maintenance (O&M) data submittals by Contractor are utilized to achieve this.
   4. Verify that the Owner's operating personnel are adequately trained: Formal training conducted by Contractor is utilized to achieve this.

B. The Commissioning Authority directs and coordinates all commissioning activities; this section describes some but not all of the Commissioning Authority's responsibilities.

C. The Commissioning Authority is employed by Owner.

1.02 SCOPE OF COMMISSIONING

A. The following are to be commissioned:
   B. Plumbing Systems:
   C. HVAC System, including:
   D. Special Ventilation:
   E. Electrical Systems:
   F. Electronic Safety and Security:
   G. Communications:
   H. Other equipment and systems explicitly identified elsewhere in Contract Documents as requiring commissioning.
   I. Indoor Air Quality Procedures: The Commissioning Authority will coordinate; Contractor will execute; see Section 01 57 21.

1.03 RELATED REQUIREMENTS

A. Section 01 57 21 - Indoor Air Quality Controls: Precautions and procedures; smoking room testing; building flush-out.
   B. Section 01 78 00 - Closeout Submittals: Scope and procedures for operation and maintenance manuals and project record documents.

1.04 REFERENCE STANDARDS

1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures; except:
   1. Make all submittals specified in this section, and elsewhere where indicated for commissioning purposes, directly to the Commissioning Authority, unless they require review by Architect; in that case, submit to Architect first.
   2. Submit one copy to the Commissioning Authority, not to be returned.
   3. Make commissioning submittals on time schedule specified by Commissioning Authority.
   4. Submittals indicated as "Draft" are intended for the use of the Commissioning Authority in preparation of Prefunctional Checklists or Functional Test requirements; submit in editable electronic format, Microsoft Word 2003 preferred.
   5. As soon as possible after submittals made to Architect are approved, submit copy of approved submittal to the Commissioning Authority.
B. Manufacturers' Instructions: Submit copies of all manufacturer-provided instructions that are shipped with the equipment as soon as the equipment is delivered.

C. Product Data: If submittals to Architect do not include the following, submit copies as soon as possible:
   1. Manufacturer's product data, cut sheets, and shop drawings.
   2. Manufacturer's installation instructions.
   3. Startup, operating, and troubleshooting procedures.
   4. Fan and pump curves.
   5. Factory test reports.
   6. Warranty information, including details of Owner's responsibilities in regard to keeping warranties in force.

D. Startup Plans and Reports.

E. Completed Prefunctional Checklists.

PART 2 PRODUCTS

2.01 TEST EQUIPMENT

A. Provide all standard testing equipment required to perform startup and initial checkout and required Functional Testing; unless otherwise noted such testing equipment will NOT become the property of Owner.

B. Calibration Tolerances: Provide testing equipment of sufficient quality and accuracy to test and/or measure system performance with the tolerances specified. If not otherwise noted, the following minimum requirements apply:
   1. Temperature Sensors and Digital Thermometers: Certified calibration within past year to accuracy of 0.5 degree F and resolution of plus/minus 0.1 degree F.
   2. Pressure Sensors: Accuracy of plus/minus 2.0 percent of the value range being measured (not full range of meter), calibrated within the last year.
   3. Calibration: According to the manufacturer's recommended intervals and when dropped or damaged; affix calibration tags or keep certificates readily available for inspection.

C. Equipment-Specific Tools: Where special testing equipment, tools and instruments are specific to a piece of equipment, are only available from the vendor, and are required in order to accomplish startup or Functional Testing, provide such equipment, tools, and instruments as part of the work at no extra cost to Owner; such equipment, tools, and instruments are to become the property of Owner.

D. Dataloggers: Independent equipment and software for monitoring flows, currents, status, pressures, etc. of equipment.
   1. Dataloggers required to for Functional Tests will be provided by the Commissioning Authority and will not become the property of Owner.

PART 3 EXECUTION

3.01 COMMISSIONING PLAN

A. Commissioning Authority has prepared the Commissioning Plan.
   1. Attend meetings called by the Commissioning Authority for purposes of completing the commissioning plan.
   2. Require attendance and participation of relevant subcontractors, installers, suppliers, and manufacturer representatives.

B. Contractor is responsible for compliance with the Commissioning Plan.

C. Commissioning Plan: The commissioning schedule, procedures, and coordination requirements for all parties in the commissioning process.

D. Commissioning Schedule:
   1. Submit anticipated dates of startup of each item of equipment and system to Commissioning Authority within 60 days after award of Contract.
   2. Re-submit anticipated startup dates monthly, but not less than 4 weeks prior to startup.
3. Prefunctional Checklists and Functional Tests are to be performed in sequence from components, to subsystems, to systems.
4. Provide sufficient notice to Commissioning Authority for delivery of relevant Checklists and Functional Test procedures, to avoid delay.

3.02 STARTUP PLANS AND REPORTS
A. Startup Plans: For each item of equipment and system for which the manufacturer provides a startup plan, submit the plan not less than 8 weeks prior to startup.
B. Startup Reports: For each item of equipment and system for which the manufacturer provides a startup checklist (or startup plan or field checkout sheet), document compliance by submitting the completed startup checklist prior to startup, signed and dated by responsible entity.
C. Submit directly to the Commissioning Authority.

3.03 PREFUNCTIONAL CHECKLISTS
A. A Prefunctional Checklist is required to be filled out for each item of equipment or other assembly specified to be commissioned.
   1. No sampling of identical or near-identical items is allowed.
   2. These checklists do not replace manufacturers' recommended startup checklists, regardless of apparent redundancy.
   3. Prefunctional Checklist forms will not be complete until after award of the contract; the following types of information will be gathered via the completed Checklist forms:
      a. Certification by installing contractor that the unit is properly installed, started up, and operating and ready for Functional Testing.
      b. Confirmation of receipt of each shop drawing and commissioning submittal specified, itemized by unit.
      c. Manufacturer, model number, and relevant capacity information; list information "as specified," "as submitted," and "as installed."
      d. Serial number of installed unit.
      e. List of inspections to be conducted to document proper installation prior to startup and Functional Testing; these will be primarily static inspections and procedures; for equipment and systems may include normal manufacturer's start-up checklist items and minor testing.
      f. Sensor and actuator calibration information.
B. Contractor is responsible for filling out Prefunctional Checklists, after completion of installation and before startup; witnessing by the Commissioning Authority is not required unless otherwise specified.
   1. Each line item without deficiency is to be witnessed, initialed, and dated by the actual witness; checklists are not complete until all line items are initialed and dated complete without deficiencies.
   2. Checklists with incomplete items may be submitted for approval provided the Contractor attests that incomplete items do not preclude the performance of safe and reliable Functional Testing; re-submission of the Checklist is required upon completion of remaining items.
   3. Individual Checklists may contain line items that are the responsibility of more than one installer; Contractor shall assign responsibility to appropriate installers or subcontractors, with identification recorded on the form.
   4. If any Checklist line item is not relevant, record reasons on the form.
   5. Contractor may independently perform startup inspections and/or tests, at his option.
   6. Regardless of these reporting requirements, Contractor is responsible for correct startup and operation.
   7. Submit completed Checklists to Commissioning Authority within two days of completion.
C. Commissioning Authority is responsible for furnishing the Prefunctional Checklists to Contractor.
   1. Initial Drafts: Contractor is responsible for initial draft of Prefunctional Checklist where so indicated in the Contract Documents.
2. Provide all additional information requested by Commissioning Authority to aid in preparation of checklists, such as shop drawing submittals, manufacturers’ startup checklists, and O&M data.
3. Commissioning Authority may add any relevant items deemed necessary regardless of whether they are explicitly mentioned in the Contract Documents or not.
4. When asked to review the proposed Checklists, do so in a timely manner.

D. Commissioning Authority Witnessing: Required for:
   1. Each piece of primary equipment, unless sampling of multiple similar units is allowed by the commissioning plan.
   2. A sampling of non-primary equipment, as allowed by the commissioning plan.

E. Deficiencies: Correct deficiencies and re-inspect or re-test, as applicable, at no extra cost to Owner.
   1. If difficulty in correction would delay progress, report deficiency to the Commissioning Authority immediately.

3.04 FUNCTIONAL TESTS

A. A Functional Test is required for each item of equipment, system, or other assembly specified to be commissioned, unless sampling of multiple identical or near-identical units is allowed by the final test procedures.

B. Contractor is responsible for execution of required Functional Tests, after completion of Prefunctional Checklist and before closeout.

C. Commissioning Authority is responsible for witnessing and reporting results of Functional Tests, including preparation and completion of forms for that purpose.

D. Contractor is responsible for correction of deficiencies and re-testing at no extra cost to Owner; if a deficiency is not corrected and re-tested immediately, the Commissioning Authority will document the deficiency and the Contractor's stated intentions regarding correction.
   1. Deficiencies are any condition in the installation or function of a component, piece of equipment or system that is not in compliance with the Contract Documents or does not perform properly.
   2. When the deficiency has been corrected, the Contractor completes the form certifying that the item is ready to be re-tested and returns the form to the Commissioning Authority; the Commissioning Authority will reschedule the test and the Contractor shall re-test.
   3. Identical or Near-Identical Items: If 10 percent, or three, whichever is greater, of identical or near-identical items fail to perform due to material or manufacturing defect, all items will be considered defective; provide a proposal for correction within 2 weeks after notification of defect, including provision for testing sample installations prior to replacement of all items.
   4. Contractor shall bear the cost of Owner and Commissioning Authority personnel time witnessing re-testing.
   5. Contractor shall bear the cost of Owner and Commissioning Authority personnel time witnessing re-testing if the test failed due to failure to execute the relevant Prefunctional Checklist correctly; if the test failed for reasons that would not have been identified in the Prefunctional Checklist process, Contractor shall bear the cost of the second and subsequent re-tests.

E. Functional Test Procedures:
   1. Some test procedures are included in the Contract Documents; where Functional Test procedures are not included in the Contract Documents, test procedures will be determined by the Commissioning Authority with input by and coordination with Contractor.
   2. Examples of Functional Testing:
      a. Test the dynamic function and operation of equipment and systems (rather than just components) using manual (direct observation) or monitoring methods under full operation (e.g., the chiller pump is tested interactively with the chiller functions to see if the pump ramps up and down to maintain the differential pressure setpoint).
b. Systems are tested under various modes, such as during low cooling or heating loads, high loads, component failures, unoccupied, varying outside air temperatures, fire alarm, power failure, etc.

c. Systems are run through all the HVAC control system's sequences of operation and components are verified to be responding as the sequence's state.

d. Traditional air or water test and balancing (TAB) is not Functional Testing; spot checking of TAB by demonstration to the Commissioning Authority is Functional Testing.

F. Deferred Functional Tests: Some tests may need to be performed later, after substantial completion, due to partial occupancy, equipment, seasonal requirements, design or other site conditions; performance of these tests remains the Contractor's responsibility regardless of timing.

3.05 SENSOR AND ACTUATOR CALIBRATION

A. Calibrate all field-installed temperature, relative humidity, carbon monoxide, carbon dioxide, and pressure sensors and gages, and all actuators (dampers and valves) on this piece of equipment shall be calibrated. Sensors installed in the unit at the factory with calibration certification provided need not be field calibrated.

B. Calibrate using the methods described below; alternate methods may be used, if approved by Owner beforehand. See PART 2 for test instrument requirements. Record methods used on the relevant Prefunctional Checklist or other suitable forms, documenting initial, intermediate and final results.

C. All Sensors:
   1. Verify that sensor location is appropriate and away from potential causes of erratic operation.
   2. Verify that sensors with shielded cable are grounded only at one end.
   3. For sensor pairs that are used to determine a temperature or pressure difference, for temperature make sure they are reading within 0.2 degree F of each other, and for pressure, within tolerance equal to 2 percent of the reading, of each other.
   4. Tolerances for critical applications may be tighter.

D. Sensors Without Transmitters - Standard Application:
   1. Make a reading with a calibrated test instrument within 6 inches of the site sensor.
   2. Verify that the sensor reading, via the permanent thermostat, gage or building automation system, is within the tolerances in the table below of the instrument-measured value.
   3. If not, install offset, calibrate or replace sensor.

E. Sensors With Transmitters - Standard Application.
   1. Disconnect sensor.
   2. Connect a signal generator in place of sensor.
   3. Connect ammeter in series between transmitter and building automation system control panel.
   4. Using manufacturer's resistance-temperature data, simulate minimum desired temperature.
   5. Adjust transmitter potentiometer zero until 4 mA is read by the ammeter.
   6. Repeat for the maximum temperature matching 20 mA to the potentiometer span or maximum and verify at the building automation system.
   7. Record all values and recalibrate controller as necessary to conform with specified control ramps, reset schedules, proportional relationship, reset relationship and P/I reaction.
   8. Reconnect sensor.
   9. Make a reading with a calibrated test instrument within 6 inches of the site sensor.
   10. Verify that the sensor reading, via the permanent thermostat, gage or building automation system, is within the tolerances in the table below of the instrument-measured value.
   11. If not, replace sensor and repeat.
   12. For pressure sensors, perform a similar process with a suitable signal generator.

F. Sensor Tolerances for Standard Applications: Plus/minus the following maximums:
1. Watthour, Voltage, Amperage: 1 percent of design.
2. Pressure, Air, Water, Gas: 3 percent of design.
3. Air Temperatures (Outside Air, Space Air, Duct Air): 0.4 degrees F.
4. Relative Humidity: 4 percent of design.
5. Barometric Pressure: 0.1 inch of Hg.
6. Barometric Pressure: 0.1 inch of Hg (.
7. Flow Rate, Air: 10 percent of design.
8. Flow Rate, Water: 4 percent of design.
9. AHU Wet Bulb and Dew Point: 2.0 degrees F.

G. Critical Applications: For some applications more rigorous calibration techniques may be required for selected sensors. Describe any such methods used on an attached sheet.

H. Valve/Damper Stroke Setup and Check:
1. For all valve/damper actuator positions checked, verify the actual position against the control system readout.
2. Set pump/fan to normal operating mode.
3. Command valve/damper closed; visually verify that valve/damper is closed and adjust output zero signal as required.
4. Command valve/damper to open; verify position is full open and adjust output signal as required.
5. Command valve/damper to a few intermediate positions.
6. If actual valve/damper position does not reasonably correspond, replace actuator or add pilot positioner (for pneumatics).

I. Isolation Valve or System Valve Leak Check: For valves not associated with coils.
1. With full pressure in the system, command valve closed.
2. Use an ultra-sonic flow meter to detect flow or leakage.

3.06 TEST PROCEDURES - GENERAL

A. Provide skilled technicians to execute starting of equipment and to execute the Functional Tests. Ensure that they are available and present during the agreed upon schedules and for sufficient duration to complete the necessary tests, adjustments and problem-solving.

B. Provide all necessary materials and system modifications required to produce the flows, pressures, temperatures, and conditions necessary to execute the test according to the specified conditions. At completion of the test, return all affected equipment and systems to their pre-test condition.

C. Sampling: Where Functional Testing of fewer than the total number of multiple identical or near-identical items is explicitly permitted, perform sampling as follows:
1. Identical Units: Defined as units with same application and sequence of operation; only minor size or capacity difference.
2. Sampling is not allowed for:
   a. Major equipment.
   b. Life-safety-critical equipment.
   c. Prefunctional Checklist execution.
3. XX = the percent of the group of identical equipment to be included in each sample; defined for specific type of equipment.
4. YY = the percent of the sample that if failed will require another sample to be tested; defined for specific type of equipment.
5. Randomly test at least XX percent of each group of identical equipment, but not less than three units. This constitutes the “first sample.”
6. If YY percent of the units in the first sample fail, test another XX percent of the remaining identical units.
7. If YY percent of the units in the second sample fail, test all remaining identical units.
8. If frequent failures occur, resulting in more troubleshooting than testing, the Commissioning Authority may stop the testing and require Contractor to perform and document a checkout of the remaining units prior to continuing testing.
D. Manual Testing: Use hand-held instruments, immediate control system readouts, or direct observation to verify performance (contrasted to analyzing monitored data taken over time to make the “observation”).

E. Simulating Conditions: Artifically create the necessary condition for the purpose of testing the response of a system; for example apply hot air to a space sensor using a hair dryer to see the response in a VAV box.

F. Simulating Signals: Disconnect the sensor and use a signal generator to send an amperage, resistance or pressure to the transducer and control system to simulate the sensor value.

G. Over-Writing Values: Change the sensor value known to the control system in the control system to see the response of the system; for example, change the outside air temperature value from 50 degrees F to 75 degrees F to verify economizer operation.

H. Indirect Indicators: Remote indicators of a response or condition, such as a reading from a control system screen reporting a damper to be 100 percent closed, are considered indirect indicators.

I. Monitoring: Record parameters (flow, current, status, pressure, etc.) of equipment operation using dataloggers or the trending capabilities of the relevant control systems; where monitoring of specific points is called for in Functional Test Procedures:

1. All points that are monitored by the relevant control system shall be trended by Contractor; at the Commissioning Authority’s request, Contractor shall trend up to 20 percent more points than specified at no extra charge.

2. Other points will be monitored by the Commissioning Authority using dataloggers.

3. At the option of the Commissioning Authority, some control system monitoring may be replaced with datalogger monitoring.

4. Provide hard copies of monitored data in columnar format with time down left column and at least 5 columns of point values on same page.

5. Graphical output is desirable and is required for all output if the system can produce it.

6. Monitoring may be used to augment manual testing.

3.07 OPERATION AND MAINTENANCE MANUALS

A. See Section 01 78 00 for additional requirements.

B. Add design intent documentation furnished by Architect to manuals prior to submission to Owner.

C. Submit manuals related to items that were commissioned to Commissioning Authority for review; make changes recommended by Commissioning Authority.

D. Commissioning Authority will add commissioning records to manuals after submission to Owner.

END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES
A. Selective demolition of built site elements.
B. Selective demolition of building elements for alteration purposes, excluding removal of hazardous materials and toxic substances.
C. Selective salvage of building elements.
D. Abandonment and removal of existing utilities and utility structures.
E. Concrete cutting and boring.

1.02 REFERENCE STANDARDS

1.03 DEFINITIONS
A. Remove: Detach items from existing construction and legally dispose of them off-site, unless indicated to be removed and salvaged or removed and reinstalled.
B. Salvage: Detach items from existing construction and deliver them to Owner ready for reuse.
C. Remove and Reinstall: Detach items from existing construction, prepare them for reuse, and reinstall them where indicated.
D. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.
   1. Protect and Existing to Remain have the same meaning regarding work in this Section.

1.04 MATERIALS OWNERSHIP
A. Historic items, 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.
   1. Coordinate with Owner's historical adviser, who will establish special procedures for removal and salvage.

1.05 SUBMITTALS
A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
B. Site Plan: Showing:
   1. Vegetation to be protected.
   2. Areas for temporary construction and field offices.
   3. Areas for temporary and permanent placement of removed materials.
C. Demolition Plan: Submit demolition plan as specified by OSHA and local authorities.
   1. Indicate extent of demolition, removal sequence, bracing and shoring, and location and construction of barricades and fences.
   2. Identify demolition firm and submit qualifications.
   3. Include a summary of safety procedures.
D. LEED Submittals: Complete LEED Project Submittal Form, Section 01 33 00, for the following Credits. Requirements and definitions are located in Section 01 35 15 and Section 01 60 00.
   2. Credit MR 3: Salvaged, refurbished or reused materials; product cost data.
E. Project Record Documents: Accurately record actual locations of capped and active utilities and subsurface construction.

1.06 QUALITY ASSURANCE
A. Demolition Firm Qualifications: Company specializing in the type of work required.
1. Minimum of 8 years of documented experience.

1.07 PROJECT CONDITIONS
A. Minimize production of dust due to demolition operations; do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.
B. Comply with other requirements specified in Section 01 30 00 and 01 70 00.

PART 2 PRODUCTS -- NOT USED

PART 3 EXECUTION

3.01 SCOPE
A. Remove paving and curbs as required to accomplish new work.
B. Within area of new construction, remove foundation walls and footings to a minimum of 2 feet below finished grade.
C. Outside area of new construction, remove foundation walls and footings to a minimum of 2 feet below finished grade.
D. Remove concrete slabs on grade within construction limits indicated on drawings.
E. Saw cut and core concrete where indicated or as required to gain access to utilities, or provide utility tie-ins and new pathways and other access ways.
F. Remove other items indicated, for salvage, relocation, and recycling.
   1. Items to be salvaged are included on a list following this section.
G. Fill excavations, open pits, and holes in ground areas generated as result of removals, using specified fill; compact fill as specified in Section 31 22 00.

3.02 GENERAL PROCEDURES AND PROJECT CONDITIONS
A. Comply with other requirements specified in Section 01 70 00 and 01 74 19.
B. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
   1. Obtain required permits.
   2. Comply with applicable requirements of NFPA 241.
   3. Use of explosives is not permitted.
   4. Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.
   5. Provide, erect, and maintain temporary barriers and security devices.
   6. Use physical barriers to prevent access to areas that could be hazardous to workers or the public.
   7. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
   8. Do not close or obstruct roadways or sidewalks without permit.
   9. Conduct operations to minimize obstruction of public and private entrances and exits; do not obstruct required exits at any time; protect persons using entrances and exits from removal operations.
10. Obtain written permission from FS when demolition equipment will will need to traverse, infringe upon or limit access to portions of the building under use.
C. Do not begin removal until receipt of notification to proceed from Owner.
D. Do not begin removal until built elements to be salvaged or relocated have been removed.
E. Do not begin removal until vegetation to be relocated has been removed and specified measures have been taken to protect vegetation to remain.
F. Protect existing structures and other elements that are not to be removed.
   1. Provide bracing and shoring.
   2. Prevent movement or settlement of adjacent structures.
   3. Stop work immediately if adjacent structures appear to be in danger.
G. Minimize production of dust due to demolition operations; do not use water if that will result in ice, flooding, sedimentation of facility or public waterways or storm sewers, or other pollution.

H. If hazardous materials are discovered during removal operations, stop work and notify Architect, PM and FS/Owner; hazardous materials include regulated asbestos containing materials, lead, PCB’s, and mercury. See also Section 02 83 00 - Lead Control Procedures.

I. Perform demolition in a manner that maximizes salvage and recycling of materials.
   1. Comply with requirements of Section 01 74 19 - Construction Waste Management and Disposal.
   2. Dismantle existing construction and separate materials.
   3. Set aside reusable, recyclable, and salvageable materials; store and deliver to collection point or point of reuse.

J. Partial Removal of Paving and Curbs: Neatly saw cut at right angle to surface.

3.03 EXISTING UTILITIES

A. Coordinate work with utility companies; notify before starting work and comply with their requirements; obtain required permits.

B. Protect existing utilities to remain from damage.

C. Do not disrupt public utilities without permit from authority having jurisdiction.

D. Do not close, shut off, or disrupt existing life safety systems that are in use without at least 7 days prior written notification to Owner.

E. Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without at least 3 days prior written notification to Owner.

F. Locate and mark utilities to remain; mark using highly visible tags or flags, with identification of utility type; protect from damage due to subsequent construction, using substantial barricades if necessary.

G. Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities.

H. Prepare building demolition areas by disconnecting and capping utilities outside the demolition zone; identify and mark utilities to be subsequently reconnected, in same manner as other utilities to remain.

3.04 SELECTIVE DEMOLITION FOR ALTERATIONS

A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.
   1. Verify that construction and utility arrangements are as shown.
   2. Report discrepancies to Architect before disturbing existing installation.
   3. Beginning of demolition work constitutes acceptance of existing conditions that would be apparent upon examination prior to starting demolition.

B. Separate areas in which demolition is being conducted from other areas that are still occupied.
   1. Provide, erect, and maintain temporary dustproof partitions of construction specified in Section 01 50 00 in locations indicated on drawings.

C. Maintain weatherproof exterior building enclosure except for interruptions required for replacement or modifications; take care to prevent water and humidity damage.

D. Remove existing work as indicated and as required to accomplish new work.
   1. Remove rotted wood, corroded metals, and deteriorated masonry and concrete; replace with new construction specified.
   2. Remove items indicated on drawings.

E. Services (Including but not limited to HVAC, Plumbing, Fire Protection, Electrical, and Telecommunications): Remove existing systems and equipment as indicated.
   1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components.
2. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
3. Verify that abandoned services serve only abandoned facilities before removal.
4. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings; remove back to source of supply where possible, otherwise cap stub and tag with identification.

F. Protect existing work to remain.
   1. Prevent movement of structure; provide shoring and bracing if necessary.
   2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
   3. Repair adjacent construction and finishes damaged during removal work.
   4. Patch as specified for patching new work.

3.05 DEBRIS AND WASTE REMOVAL
   A. Remove debris, junk, and trash from site.
   B. Remove from site all materials not to be reused on site; comply with requirements of Section 01 74 19 - Waste Management.
   C. Leave site in clean condition, ready for subsequent work.
   D. Clean up spillage and wind-blown debris from public and private lands.

END OF SECTION