SECTION 012100 - ALLOWANCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements governing allowances.

B. Types of allowances include the following:

1. Lump-sum allowances.

1.3 DEFINITIONS

A. Allowance is a quantity of work or dollar amount established in lieu of additional requirements, used to defer selection of actual materials and equipment to a later date when direction will be provided to Contractor. If necessary, additional requirements will be issued by Change Order.

1.4 SELECTION AND PURCHASE

A. At the earliest practical date after award of the Contract, advise Architect of the date when final selection, or purchase and delivery, of each product or system described by an allowance must be completed by the Owner to avoid delaying the Work.

B. At Architect's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.

C. Purchase products and systems selected by Architect from the designated supplier.

1.5 ACTION SUBMITTALS

A. Submit proposals for purchase of products or systems included in allowances in the form specified for Change Orders.

1.6 INFORMATIONAL SUBMITTALS

A. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.

B. Submit time sheets and other documentation to show labor time and cost for installation of allowance items that include installation as part of the allowance.

C. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

1.7 LUMP-SUM ALLOWANCES

A. Allowance shall include cost to Contractor of specific products and materials ordered by Owner or selected by Architect under allowance and shall include freight and delivery to Project site.

B. Unless otherwise indicated, Contractor's costs for receiving and handling at Project site, labor, installation, overhead and profit, and similar costs related to products and materials ordered by Owner or selected by Architect under allowance shall be included as part of the Contract Sum and not part of the allowance.

C. Unused Materials: Return unused materials purchased under an allowance to manufacturer or supplier for credit to Owner, after installation has been completed and accepted.

1.8 ADJUSTMENT OF ALLOWANCES

A. Allowance Adjustment: To adjust allowance amounts, prepare a Change Order proposal based on the difference between purchase amount and the allowance, multiplied by final measurement of work-in-place where applicable. If applicable, include reasonable allowances for cutting losses, tolerances, mixing wastes, normal product imperfections, and similar margins.

1. Include installation costs in purchase amount only where indicated as part of the allowance.
2. If requested, prepare explanation and documentation to substantiate distribution of overhead costs and other markups.
3. Submit substantiation of a change in scope of Work, if any, claimed in Change Orders related to unit-cost allowances.
4. Owner reserves the right to establish the quantity of work-in-place by independent quantity survey, measure, or count.

B. Submit claims for increased costs because of a change in scope or nature of the allowance described in the Contract Documents, whether for the purchase order amount or Contractor's handling, labor, installation, overhead, and profit.

1. Do not include Contractor's or subcontractor's indirect expense in the Change Order cost amount unless it is clearly shown that the nature or extent of Work has changed from what could have been foreseen from information in the Contract Documents.
2. No change to Contractor's indirect expense is permitted for selection of higher- or lower-priced materials or systems of the same scope and nature as originally indicated.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

3.2 PREPARATION

A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

3.3 SCHEDULE OF ALLOWANCES

1. NOT USED

END OF SECTION 012100

SECTION 01 2200 - UNIT PRICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including Division 00 and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes required procedures and information regarding unit prices.

B. Related Sections include the following:

1. Division 1 Section "Allowances" for procedures for using unit prices to adjust quantity allowances.
2. Division 1 Section "Contract Modification Procedures" for procedures for submitting and handling Change Orders.
3. Division 1 Section "Quality Requirements" for general testing and inspecting requirements.

1.3 DEFINITIONS

A. Unit price is an amount proposed by bidders, stated on the Bid Form, as a price per unit of measurement for materials or services added to or deducted from the Contract Sum by appropriate modification, if estimated quantities of Work required by the Contract Documents are increased or decreased. The difference between the "add" unit price and the "credit" unit price for any particular item of work shall not be greater than 10% of the "add" price.

1.4 PROCEDURES

A. Unit prices include all necessary material, plus cost for delivery, installation, insurance, applicable taxes, overhead, and profit.

B. Measurement and Payment: Refer to individual Specification Sections for work that requires establishment of unit prices. Methods of measurement and payment for unit prices are specified in those Sections.

C. Owner reserves the right to question Contractor's measurement of work-in-place that involves use of established unit prices and to have this work measured, by the Construction Manager to verify the measurement of work-in-place, and to reconcile with the Contractor the measurement of actual work-in-place.

D. List of Unit Prices: A list of unit prices is included at the end of this Section. Specification Sections referenced in the schedule contain requirements for materials described under each unit price.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 LIST OF UNIT PRICES

A. Not Used

END OF SECTION 01 2200

SECTION 01 2300 – ALTERNATES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including Division 00 and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes required procedures and information regarding alternates.

1.3 DEFINITIONS

A. Alternate: A cost submitted by bidders and stated on the Bid Form representing certain work defined in the bidding documents. Alternates may be added to or deducted from the Base Bid amount if the Owner decides to accept a change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.

1. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate the alternate into the Work. No other adjustments are made to the Contract Sum.

1.4 PROCEDURES

A. Coordination: Modify or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.

1. Include as part of each alternate, all work as specified and indicated on the drawings, miscellaneous devices, accessory materials, and similar items incidental to or required for complete installation of the work of each alternate, whether or not indicated as part of the alternate.

B. Execute accepted alternates under the same specified and design conditions as other work of the Contract.

C. Schedule: A Schedule of Alternates is included at the end of this Section. Specification Sections referenced in the schedule contain requirements for materials necessary to achieve the work described under each alternate.

PART 2 PRODUCTS (not used)

PART 3 EXECUTION

3.1 NOTIFICATION

A. At the time of the Award of Contract or within sixty (60) days, the Construction Manager will prepare and distribute to the Contractor a notification of the status of each Alternate scheduled herein including those subsequently added by addendum.

B. The Contractor is responsible to distribute to each subcontractor or supplier involved in the work a notification of the status of each Alternate.

1. Indicate which Alternates have been:
   1) accepted,
   2) rejected, and
   3) deferred for consideration at a later date as indicated.

2. Include full description of negotiated modifications to Alternates, if any.

3.2 SCHEDULE OF ALTERNATES

A. Alternate #1 – Provide Performance and Payment Bonds

Reference Specification Section 00 0210 – Instructions to Bidders; Paragraph 1.2.E: The base bid shall exclude the costs for the Contractor to provide Performance and Labor & Material Payment Bonds. The Alternate shall add all costs associated with the Contractor providing all required Performance and Labor & Material Bonds, furnished by a surety company acceptable to Construction Manager and Owner in the amount equal to 100% of the Contract amount, reference Specification Section 00 0600 for standard bond forms.

END OF SECTION 01 2300

SECTION 01 2600 - CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including Division 00 and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section specifies required procedures for processing Contract modifications.

B. Related Sections Include the following:

1. Division 1 Section "Allowances" for procedural requirements for handling and processing allowances.
2. Division 1 Section "Unit Prices" for administrative requirements for using unit prices.
3. Division 1 Section "Product Requirements" for administrative procedures for handling requests for substitutions made after Contract award.

1.3 MINOR CHANGES IN THE WORK

A. Architect will issue through the Construction Manager, supplemental instructions authorizing Minor Changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on AIA Document G710, "Architect's Supplemental Instructions." If a Contractor determines that an "Architect's Supplemental Instructions" will impact the Contract Sum or the Contract Time, that Contractor shall notify the Construction Manager within seven (7) calendar days with a written explanation to substantiate the claim and a complete and detailed cost breakdown as required under paragraph 1.4 Proposal Requests.

1.4 PROPOSAL REQUESTS

A. Architect-Initiated Proposal Requests: The Architect through the Construction Manager will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.

1. Proposal Requests issued by the Architect through the Construction Manager are for information only. Do not consider them instructions either to stop work in progress or to execute the proposed change, unless specifically indicated to do so by the Architect and Construction Manager.
2. Within the time specified in Proposal Request after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.

a. Include a complete detailed material, equipment, and labor break down to

substantiate the proposed costs.

b. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
c. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
d. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.

B. Contractor-Initiated Proposals: If latent or unforeseen conditions require modifications to the Contract, Contractor may propose changes by submitting a request for a change to the Construction Manager. All requests must be received within three (3) working days after the condition is uncovered in order to be considered.

1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
2. Include a complete detailed material, equipment, and labor breakdown to substantiate the claim.
3. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
4. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
5. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
6. Comply with requirements in Division 1 Section "Product Requirements" if the proposed change requires substitution of one product or system for product or system specified.

C. Notwithstanding the General Terms and Conditions of the Subcontract, the following shall be applicable for all changes in the Work:

1. The allowance for Overhead and Profit for all changes in the Work shall be calculated based on the following: For Work performed by a Contractor's own forces, the Contractor shall add 10% for overhead and 5% for profit. For Work performed by lower tier Contractor(s) for the Contractor, the lower tier Contractor(s) shall only add a combined total of 10% for overhead and profit and the Contractor shall add 5% for overhead and profit to the total value of the Contractor's price. The combined total, of all involved lower tier Contractors and the Contractor, for overhead and profit shall not exceed 15%. The allowance for overhead and profit shall include supervision, field office and general expenses, overhead and profit.

D. Costs for the changes in the work shall be limited to the following:

1. Costs of labor, including social security, old age and unemployment insurance, fringe benefits required by agreement or custom, and workers' compensation insurance; Labor: Labor hours shall include hours only for those workmen and working foremen directly involved in performing the Change Order work. Supervision above the level of working foreman, such as general foreman, superintendent, project manager, etc., is considered to be included in the allowance for overhead and profit
2. Costs of materials, supplies and equipment, including cost of transportation, whether incorporated or consumed;
3. Equipment: allowable change order cost may include appropriate amounts for rental of major equipment specifically needed to perform the Change Order work (defined as tools and equipment with an individual purchase cost of more than $750). For Contractor owned equipment, the equipment rental rates allowed to be used for pricing change order work shall be 100% of the published rental rates, for the area in which the project is located, listed in the most current publication of the Blue Book calculated into a maximum hourly rate to be applied to the hours the equipment is used performing the Change Order work. The maximum hourly rate shall cover all associated costs including but not limited to delivery, fuel, mileage, maintenance, repairs and all applicable taxes. For Contractor owned equipment the aggregate equipment rental charges for any single piece of equipment used in all Change Order work shall be limited to 50% of the fair market value of the piece of equipment.
4. Cost of premiums for all bonds and insurance, permit fees, and sales, use or similar taxes related to the Work.
5. Direct and indirect costs are covered by the allowance for overhead and profit: The allowance shall cover the Contractor's profit and all indirect costs associated with the Change Order work. Items covered by the allowance included, but are not limited to: home office expenses, branch office and field office overhead expense of any kind; project management; superintendent; general foreman; estimating; engineering; coordination; asbuilts; expediting; purchasing; detailing; legal; accounting; data processing or other administrative expenses; shop drawings; insurance; delivery costs; warranty expense costs; and small tools as defined as tools and equipment (power or non-power) with an individual purchase cost of less than $750.00.

1.5 CHANGE ORDER PROCEDURES

A. On Owner's approval of a Proposal Request, the Construction Manager will issue a Change Order for signatures of Contractor and Construction Manager.
B. Promptly revise application for payment forms to record each approved change order and adjust the contract sum / price; revise schedule of change orders. Change Orders should not be listed on applications for payments until they have been fully executed.
C. Promptly revise progress schedules to reflect any change in contract time; revise sub schedules to adjust time for other items of work affected by the change and resubmit.
D. Promptly enter changes in Project Record Documents.

1.6 CONSTRUCTION CHANGE DIRECTIVE

A. Construction Change Directive: The Architect, through the Construction Manager, will issue a Change Directive to instruct the Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.

1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.

B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive. Any work performed on a time and material basis must be authorized by the Construction Manager on a daily basis.

1. Any Work authorized to be performed on a time and material basis or signed daily time ticket basis will require DAILY verification by the Construction Manager. Any failure to have the time tickets verified daily may result in forfeiture of any Change Order or payment for the Work.

2. After completion of the change, but no later than the 15th of the following month, submit an itemized account and supporting data, including daily time and material sheets signed by the Construction Manager, necessary to substantiate cost and time adjustments to the Contract. The Construction Manager will process a Change Order for approved, signed time ticket work. Any failure to submit the itemized account, with supporting data, by the 15th of the following month, may result in forfeiture of any Change Order or payment for the Work.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 2600

SECTION 01 2900 - PAYMENT PROCEDURES

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including Division 00 and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section specifies the required procedures and information necessary for the processing of applications for payment.

1.3 SCHEDULE OF VALUES

A. Coordination: Coordinate preparation of the Schedule of Values with preparation of Sub-Contractor's Construction Schedule.

1. Correlate line items in the Schedule of Values with other required administrative forms and schedules, including Submittals Schedule and Application for Payment forms with Continuation Sheets.
2. Submit the Schedule of Values and the information and documents described in Paragraph 1.3.H, to the Construction Manager at the earliest possible date but no later than fourteen (14) days following the date of the Notice to Proceed.

B. Format and Content: Use the Project Manual table of contents as a guide to establish line items for the Schedule of Values. Provide at least one line item for each Specification Section.

1. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Provide several line items for principal subcontract amounts, where appropriate. Provide a separate material and labor line item for each construction item included in the breakdown.
2. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
3. Provide a separate line item in the Schedule of Values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
4. Allowances: Provide a separate line item in the Schedule of Values for each allowance. Show line-item value of unit-cost allowances, as a product of the unit cost, multiplied by measured quantity. Use information indicated in the Contract Documents to determine quantities.
5. Each item in the Schedule of Values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.
    a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place must be shown as separate line items in the Schedule of Values or distributed as general overhead expense, at Contractor's option.
6. Separate the cost of the work by phase or project area on the Schedule of Values as

directed by the CM. When a separate breakdown by phase or project area is required by the Construction Manager a detailed schedule of values is required for each phase or project area.

7. Schedule of values to be submitted on the AIA G702/G703.
8. Secure the Construction Manager's approval of the Schedule of Values prior to submitting the first application for payment.
9. Provide a line item for Project Record Documents – Specification Section 01 7839 and Demonstration & Training – Specification Section 01 7900.
10. A line item for mobilization will not be approved without a detailed breakdown to substantiate the requested value. If mobilization is requested a line item with an equal amount for de-mobilization will be required.

1.4 APPLICATIONS FOR PAYMENT

A. Each Application for Payment shall be consistent with previous applications and payments as certified by the Construction Manager and Architect and paid for by Owner.

1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.

B. Payment Application Times: Submit to the Construction Manager a rough draft copy of the monthly Application for Payment by the 20th day of each month, with the completion percentages of work projected through the last day of the month. Following Construction Manager and Architect review of the rough draft Application for Payment, Contractors shall make proper revisions as directed by the Construction Manager and submit the formal copies by the 20th day of the month.

C. Payment Application Forms: Use AIA Document G702 CMA and AIA Document G703 1992 Forms Continuation Sheets as form for Applications for Payment.

D. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. The Construction Manager will return incomplete applications without action.

1. Entries shall match data on the approved Schedule of Values.
2. Include amounts of Change Orders issued before last day of construction period covered by application. Only fully executed Change Orders shall be included.

E. Retainage: The Owner, unless otherwise noted, shall retain ten percent (10%) of the approved value of the Work performed until Substantial Completion. Retention release following Substantial Completion shall be at the sole discretion of the Construction Manager. No reduction in retention shall be considered until such time that all Punch List items have been completed and accepted; all Owner training has been provided and documented; all Operation and Maintenance Manuals have been submitted and approved; all As-Built information has been submitted and approved; all Turn-Over Material delivered and accepted and all other items deemed as necessary closeout information / documentation by the Owner and/or Construction Manager has been submitted and approved.

F. The Architect's approval of the applications for progress payments and final payment will

be contingent upon the Architect's approval of the Project Record Documents.

G. Initial Application for Payment: Information and documents that must be submitted and approved by the CM prior to the submission of the first Application for Payment, include the following:

1. List of Contractors.
2. Schedule of Values.
3. Contractor's Construction Schedule (preliminary if not final).
4. Submittals Schedule (preliminary if not final).
5. List of Contractor's staff assignments.
6. Fully Executed Subcontract.
7. Approved Performance and Material and Labor Payment Bond & fully executed Dual Obligee Rider.
8. Certificates of insurance and insurance policies.
9. A completed Contractor Labor Rate Sheet for each labor classification performing work under the Contract. Submit this information on Arc Building Partners Form # 103 Contract Labor Rate Worksheet following the Special Conditions.
10. Contractor's cash flow projection for the project.

H. Monthly Payment Application Process

1. Rough draft applications are to be submitted to the Construction Manager on or before the 20th day the month; if the 20th is not a regular work day, rough draft applications are due the work day prior to the 20th. Earned values may be projected out to the end of the month.
2. Upon receipt, the draft will be reviewed and returned for any required revisions.
3. Change Order amounts may be included only after they have been fully executed and the work completed.
4. Required Reports for previous pay period are due with the rough draft application on or before the 20th day of the month; if the 20th is not a regular work day, the work day prior to the 20th.

I. Finalized Monthly Payment Application

1. Upon receipt of the reviewed draft, the Contractor will make the necessary revisions to the application.
2. Contractor shall then submit the following as a comprehensive application submission no later than the 28th day of the month:
   a. Application and Certificate for Payment, AIA G702 CMa / G703 (3 originals required)
      i) Stored Materials - an insurance certificate with stored materials coverage listed in an amount equal to or exceeding the amount in the pay application; certificate holder shall be listed as Arc Building Partners, 100 S. Elmwood Ave., Buffalo, NY 14202; additional insureds shall be Arc Building Partners, and OTHERS AS REQ'D BY PROJECT. Also required may include invoices for the materials, photos of the materials, and any other requirement as requested and dependent upon the situation.
   b. Interim Waiver of Lien and Claim – Contractor shall fully execute and submit a copy of the Interim Waiver of Lien, form attached to Specification Section 00 0400 – Special Conditions (3 originals required).

c. DDP-3 Form – Monthly Employment Utilization Report (all tiers).
d. Certified Payroll Sheets (all tiers).
e. Daily Manpower Reports (all tiers).
f. Tool-Box Meeting Minutes (all tiers).

3. The Construction Manager will return incomplete or incorrect applications for any necessary revisions. Any failure on the part of the Contractor to include all required components within their comprehensive application submission shall delay processing until the billing cycle after deficiencies are corrected.
4. Once comprehensive application submissions are approved by the Construction Manager, the Construction Manager, Architect and Owner Representative shall expedite approval signatures.
5. With approval signatures complete, the Construction Manager shall:

a. Return (1) fully executed Application and Certificate for Payment, AIA G702 CMa / G703 to the Architect for their records.
b. Retain (1) full comprehensive application submission until final project completion.
c. Submit (2) full comprehensive application submission to the Owners Representative for payment release processing.

J. Application for Payment at Substantial Completion: After the Architect has issued the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.

1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
2. All MWBEs listed as being utilized on the project must be paid in full prior to any FINAL Retention Release.

K. Final Payment Application: Submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:

1. Evidence of completion of Project Closeout Requirements.
2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
3. Updated final statement, accounting for final changes to the Contract Sum.
4. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims".
5. AIA Document G706A, "Contractor's Affidavit of Release of Liens".
6. AIA Document G707, "Consent of Surety and Final Payment".
7. Proof of final payment in full (including any retention held by the Contractor) to all MWBEs listed on project for participation credit. In circumstances where proof of final payment cannot be provided, the Construction Manager shall issue a joint check agreement for the final amounts due the MWBE Contractor and/or supplier.
8. Final Waiver of Lien and Claim.

PART 2 – PRODUCTS (not used)

PART 3 – EXECUTION (not used)

END OF SECTION 01 2900

SECTION 01 3100 - PROJECT MANAGEMENT AND COORDINATION

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including Division 00 and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:

1. General project coordination procedures.
2. Coordination Drawings.
3. Administrative and supervisory personnel.
4. Project meetings.

B. Each Contractor shall participate in coordination requirements. Certain areas of responsibility will be assigned to a specific Contractor or to the Construction Manager.

C. Related Sections: The following Sections contain requirements that relate to this Section:

1. Division 1 Section "Execution Requirements" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
2. Division 1 Section "Closeout Procedures" for coordinating Contract closeout.

1.3 PROJECT WEB SITE

A. Project Web Site: Contractor shall utilize "CMIC", Arc Building Partners Project Web Site Software, for the purposes of hosting and managing project communication and documentation, including but not limited to:

1. Submittals.
2. Requests for Information (RFI).
3. Meeting Minutes.
4. Project Forms.

1.4 COORDINATION

A. The Construction Manager (CM) shall be the party through which change orders, payment requests, request for information, submittals, and other information shall be processed and communicated from the Contractors to the Owner, Architect/Engineer, or both; and from either the Owner, Architect/Engineer, or both to the Contractors. All communication with on-site parties and Contractor(s) must be either through the CM or with the CM's prior knowledge. There will be no circumventing of these established lines of communication by the Owner, Architect/Engineer, or individual Contractors, with the exception of the miscellaneous day-to-day conversations that must take place between organizations who work together on a job site.

B. Coordination: Each Contractor shall coordinate its construction operations with those of other Contractors and entities to ensure efficient and orderly installation of each part of the Work. Each Contractor shall coordinate its operations with operations, included in different Sections, which depend on each other for proper installation, connection, and operation.

1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
2. Each Contractor shall expedite the laying out of their Work when the location of Work by other trades is dependent upon such layout. Whenever the Work of one Contractor is delayed due to the failure of another to layout their Work or to effect timely completion of any portion of their Work, the Contractor being delayed shall notify the CM, who shall notify the Contractor to take prompt and effective action to complete the Work which is causing the delay. If the Contractor fails to take prompt and effective action to complete the Work, causing the delay, the CM shall have the right to authorize another Contractor to complete the Work and charge the Contractor causing the delay for these costs. The CM shall be the sole judge as to the responsibility for the delay.
3. Coordinate installation of different components with other Contractors to ensure maximum accessibility for required maintenance, service, and repair.
4. Before commencing work, each Contractor shall provide written acceptance of grades, structures, and/or systems, either existing or installed by other Contractors, adjacent to or upon which this Contractor will be installing their work. Failure to do so shall constitute automatic acceptance of the existing conditions.
5. Make adequate provisions to accommodate items scheduled for later installation.

C. Daily, by noon of each working day, the Contractor shall submit to the CM field office, a manpower account and a brief description of Work being performed that day, along with a brief description of Work to be performed the next working day. The CM will provide an appropriate form on which this should be noted.

D. If necessary, prepare memoranda for distribution by the Construction Manager to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.

1. Prepare similar memoranda for Owner and separate Contractors if coordination of their Work is required.

E. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other Contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:

1. Preparation of Contractor's Construction Schedule.
2. Preparation of the Schedule of Values.
3. Installation and removal of temporary facilities and controls.
4. Delivery and processing of submittals.
5. Progress meetings.
6. Preinstallation conferences.

7. Project closeout activities.

F. Staff Names: Within 14 calendar days of starting construction operations, submit to the Construction Manager a list of principal staff 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.

G. Sub-Contractors: Within 14 calendar days of Notice of Award, submit to the Construction Manager a list of Sub-Contractors including addresses and phone numbers.

1.4 COORDINATION DRAWINGS

Not Used

1.5 ADMINISTRATIVE AND SUPERVISORY PERSONNEL

A. General: This project requires a full time competent superintendent at the jobsite. The superintendent shall not be replaced without the consent of the Construction Manager, unless the superintendent proves to be unsatisfactory to the Construction Manager or ceases to be in the Contractors employ. In addition to Project superintendent, provide other administrative and supervisory personnel as required for proper performance of the Work.

1.6 REQUESTS FOR INFORMATION (RFIs)

A. Requests for Information (RFI's) are requests for clarifications or questions regarding the contract drawings and specifications, not contract terms, scheduling items, or general correspondence, nor, are they to be as a means to describe or request approval of alternate construction means, methods or concepts or substitution for materials, systems means and methods.

B. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI.

1. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of Contractors.

C. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:

1. Project name.
2. Project number.
3. Date.
4. Name of Contractor.
5. Name of Construction Manager.
6. RFI number, numbered sequentially.
7. RFI subject.
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 resolution. If Contractor's solution(s) impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
12. Contractor's signature.
13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.

    a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.

D. RFI Forms: are submitted electronically via CMIC, Arc Building Partners Project Web Site Software.

E. Architect's and Construction Manager's Action: Architect and Construction Manager will review each RFI, determine action required, and respond.

1. The following RFIs will be returned without action:

    a. Requests for approval of submittals.
    b. Requests for approval of substitutions.
    c. Requests for coordination information already indicated in the Contract Documents.
    d. Requests for adjustments in the Contract Time or the Contract Sum.
    e. Requests for interpretation of Architect's actions on submittals.
    f. Incomplete RFIs or inaccurately prepared RFIs.

2. 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 Division 01 Section "Contract Modification Procedures."

    a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Construction Manager in writing within 10 days of receipt of the RFI response.

1.7 PROJECT MEETINGS

A. General: The Construction Manager shall schedule and conduct meetings and conferences at Project site, unless otherwise indicated.

1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times.
2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
3. Minutes: Record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Architect.

B. Preconstruction Conference: The Construction Manager shall schedule a preconstruction conference before starting construction, at a time convenient to Owner, Construction Manager, and Architect. Hold the conference at Project site or another convenient location.

Conduct the meeting to review responsibilities and personnel assignments.

1. Attendees: Authorized representatives of Owner, Construction Manager, Architect, and their consultants; Contractor and its superintendent; major Contractors; manufacturers; suppliers; and other concerned parties shall attend the conference. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
2. Agenda: Discuss items of significance that could affect progress, including the following:

    a. Tentative construction schedule.
    b. Phasing.
    c. Critical work sequencing.
    d. Designation of responsible personnel.
    e. Procedures for processing field decisions and Change Orders.
    f. Procedures for processing Applications for Payment.
    g. Distribution of the Contract Documents.
    h. Submittal procedures.
    i. Preparation of Record Documents.
    j. Use of the premises.
    k. Responsibility for temporary facilities and controls.
    l. Parking availability.
    m. Office, work, and storage areas.
    n. Equipment deliveries and priorities.
    o. First aid.
    p. Security.
    q. Progress cleaning.
    r. Working hours.

C. Preinstallation Conferences: The Construction Manager shall conduct a pre-installation conference at the project site before each major construction activity including but not limited to deep excavations, structural steel, abatement, foundations, building envelope, roofing, EIFS, metal panel and masonry.

1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect and Owner of scheduled meeting dates.
2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:

    a. Contract Documents.
    b. Options.
    c. Related Change Orders.
    d. Purchases.
    e. Deliveries.
    f. Submittals.
    g. Review of mockups.
    h. Possible conflicts.
    i. Compatibility problems.
    j. Time schedules.

k. Weather limitations.
l. Manufacturer's written recommendations.
m. Warranty requirements.
n. Compatibility of materials.
o. Acceptability of substrates.
p. Temporary facilities and controls.
q. Space and access limitations.
r. Regulations of authorities having jurisdiction.
s. Testing and inspecting requirements.
t. Required performance results.
u. Protection of construction and personnel.

3. Record significant conference discussions, agreements, and disagreements.
4. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.

D. Progress Meetings: The CM will schedule and designate location of the progress meetings. As a minimum, project management meetings will be held every two weeks and superintendent's meetings will be held one hour before the start of work, one day of each week of the project. Coordinate dates of meetings with preparation of payment requests.

1. Attendees: In addition to representatives of Owner, Construction Manager, and Architect, each Contractor, Contractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
2. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.

a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's Construction Schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
b. Review present and future needs of each entity present, including the following:

1) Interface requirements.
2) Sequence of operations.
3) Status of submittals.
4) Deliveries.
5) Off-site fabrication.
6) Access.
7) Site utilization.
8) Temporary facilities and controls.

9) Work hours.
10) Hazards and risks.
11) Progress cleaning.
12) Quality and work standards.
13) Change Orders.
14) Documentation of information for payment requests.

3. Reporting: Distribute minutes of the meeting to each party present and to parties who should have been present. Include a brief summary, in narrative form, of progress since the previous meeting and report.
   a. Schedule Updating: Revise Contractor's Construction Schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

END OF SECTION 01 3100

Digital Data Release Agreement

Project Name: _____
Arc Project No.: _____

License to use Electronic Media

Digital Data is being provided relative to the above-referenced project (Project) in accordance with the terms contained in this Agreement. Digital Data is defined as information, communications, drawings, or designs created or stored for the Project in digital form. No representation is made as to the completeness, currency or accuracy in the Digital Data because of reasons inherent to Digital Data. All Digital Data appears to be accurate, however, this apparent accuracy is an artifact of the software itself and of the techniques used to generate it, and is in no way intended to imply actual accuracy. User takes full responsibility for Construction Means and Methods and for the accuracy and correctness of all measurements, areas, inventories or other data extracted from the Digital Data, either manually or with the use of a computer.

User is advised that any translation of Digital Data from one computer system or environment to another, can and will result in the loss of important data. This loss can include, but may not be limited to, portions of text and dimensions, the existence, location or scale of symbols or other elements of graphics. This potential loss of data may result in coordination and construction problems in the field and in the creation of coordination drawings, shop drawings, or the like. No representations are made as to the usability of this Digital Data on any system or for any purpose.

This Digital Data is being supplied for your sole use as indicated herein, and only for that use. Digital Data contained in these electronic files is used at the sole risk of the user and without liability or legal exposure to the Owner, Architect or Construction Manager. User agrees to make no claim and hereby waives, to the fullest extent permitted by law, any claim or cause of action of any nature against the Owner, Architect or Construction Manager or any of their officers, directors, employees, clients, agents or sub-consultants that may arise out of or in connection with the use of the electronic files or the Digital Data.

User is hereby granted a nonexclusive, one-time license to use the selected data of the Project solely for the purpose of shop drawings, coordination drawings and field coordination. No other license, right, or further use is granted or implied. User shall not assign, delegate, sublicense, pledge or otherwise transfer any license granted herein to another party without the prior written agreement of the creator of this Digital Data.

In consideration and to the fullest extent permitted by law user agrees to defend, indemnify and hold the Owner, Architect, and Construction Manager harmless from and against any and all claims, losses, liabilities and damages arising out of or related to any use, reuse or alteration of the Digital Data.

This Agreement contains the entire and integrated agreement between the parties. Except as specifically set forth herein, this Agreement does not create any other contractual relationship between the parties.

Please sign and return this Agreement to and the requested media will be forwarded to you.

_____ accepts the above listed terms and conditions.
(Company Name - User)

Printed Name & Title: _____

Signature: _____ Date: _____

SECTION 01 3300 - SUBMITTAL PROCEDURES

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including Division 00 and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other miscellaneous submittals.

B. Related Sections include the following:

1. Division 1 Section "Payment Procedures" for submitting Applications for Payment.
2. Division 1 Section "Project Management and Coordination" for submitting Coordination Drawings.
3. Division 1 Section "Contract Closeout" for submitting warranties, Project Record Documents and operation and maintenance manuals.

1.3 DEFINITIONS

A. Action Submittals: Written and graphic information that requires Architect's/Engineer's and the Construction Manager responsive action.

B. Informational Submittals: Written information that does not require the Architect's and the Construction Manager approval. Submittals may be rejected for not complying with requirements.

C. Submittals Required by the Construction Manager: Written and/or graphic information that are required by the Construction Manager. Submittals may be rejected for not complying with the requirements.

D. Physical Submittals: Those submittals that cannot be processed electronically, i.e. samples, mock-ups, etc.

E. Portable Document Format (PDF): An open standard file format licensed by Adobe Systems used for representing documents in a device-independent and display resolution-independent fixed-layout document format.

1.4 SUBMITTAL PROCEDURES

A. Digital Data Files: Electronic copies of CAD Drawings of the Contract Drawings will be provided by the Architect to the Construction Manager for the Contractor's use in preparing submittals.

1. Contractors will be furnished with individual digital data drawing files of the

Contract Drawings upon request for use in preparing Shop Drawings and Project record drawings.

a. Architect makes no representations as to the accuracy or completeness of digital data drawing files as they relate to the Contract Drawings.
b. Digital Drawing Software Program: The Contract Drawings are available in Autocad Versions 14 through 2008. Please specify version with request. Contractors are responsible for any conversion they require into other formats.
c. Contractor shall execute a data licensing agreement in the form of Agreement included at the end of this section.

B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.

a. Architect and Construction Manager reserve the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

C. Processing Time: Allow enough time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal.

1. Review: Allow 15 days for review of each submittal. Allow additional time if processing must be delayed to permit coordination with subsequent submittals. Architect will advise Contractor through the Construction Manager when a submittal that is being processed, must be delayed for coordination.

D. Submittal Item Cover Sheet:

1. The Submittal Item Cover Sheet, Form 104, is attached to the end of this Specifications Section.
2. The Submit Item Cover Sheet must be combined with the submittal to create one (1) Electronic Document for submission.
3. Ensure Submittal Item Cover Sheet is filled out correctly and in its entirety. Failure to fill out the Cover Sheet correctly and in its entirety may result in processing delays and submittal rejection.

E. Deviations: Highlight, encircle, or otherwise identify any and all deviations from the Contract Documents on submittals. Approval of a submittal does not imply or indicate approval of any change in a contract requirement. Any deviation from the contract document must be highlighted on the submittal. It must specifically state, "submitted for approval of a change in the contract requirement", and the Architect must specifically approve the deviation as "Approval of a change in the contract requirement." Any item of work, even if shown on an approved submittal, which does not comply with the contract, must be removed and replaced with work that complies with the contract.

F. Electronic Submission: Contractors are to submit all submittals electronically via Arc Building Partners / CMIC project website. Exceptions are as follows:

1. Samples including color samples shall be delivered direct to the Construction Manager. A copy of the submittal cover sheets shall be uploaded to the Arc Building Partners / CMIC project website.
2. Shop Drawings: Contractor shall submit all shop drawings electronically to the Construction Manager via email as PDF electronic files. A copy of the submittal cover sheet shall be uploaded to the Arc Building Partners CMIC project website. Once approved, the Contractor shall provide two (2) hard copies of the approved shop drawings to the Construction Manager for record.

G. Transmittal (for shop drawings, samples and color samples): Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Architect and Construction Manager will return submittals, without review, received from sources other than Contractor.

1. On an attached separate sheet (for shop drawings, samples and color samples only), prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Architect and Construction Manager on previous submittals, and deviations from requirements of the Contract Documents, including minor variations and limitations. Include the same label information as the related submittal.
2. Include Contractor's certification stating that information submitted complies with requirements of the Contract Documents.
3. Transmittal Form: Provide locations on form for the following information:

a. Project name.
b. Date.
c. Destination (To:).
d. Source (From:).
e. Names of Contractor, manufacturer, and supplier.
f. Category and type of submittal.
g. Submittal purpose and description.
h. Submittal and transmittal distribution record.
i. Remarks.
j. Signature of transmitter.

H. Distribution: Furnish hard copies and PDF electronic files of accepted submittals to manufacturers, Contractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for coordination and performance of construction activities. Show distribution on transmittal forms. Provide additional copies of reviewed shop drawings as requested by the Construction Manager for coordination with other Contractors.

I. Use for Construction: Use only final submittals with mark indicating action taken by Architect and Construction Manager in connection with construction.

PART 2 – PRODUCTS

2.1 ACTION SUBMITTALS

A. General: Prepare and submit Action Submittals required by individual Specification Sections Electronically, via email as PDF electronic files, with the exception of sample which will be delivered to the Construction Manager.

B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.

1. If information must be specially prepared for submittal because standard printed data are not suitable for use, submit as Shop Drawings, not as Product Data.
2. Mark each copy of each submittal to show which products and options are applicable.
3. Include the following information, as applicable:

    a. Manufacturer's written recommendations.
    b. Manufacturer's product specifications.
    c. Manufacturer's installation instructions.
    d. Standard color charts.
    e. Manufacturer's catalog cuts.
    f. Wiring diagrams showing factory-installed wiring.
    g. Printed performance curves.
    h. Operational range diagrams.
    i. Mill reports.
    j. Standard product operating and maintenance manuals.
    k. Compliance with recognized trade association standards.
    l. Compliance with recognized testing agency standards.
    m. Application of testing agency labels and seals.
    n. Notation of coordination requirements.

C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.

1. Preparation: Include the following information, as applicable:

    a. Dimensions.
    b. Identification of products.
    c. Fabrication and installation drawings.
    d. Roughing-in and setting diagrams.
    e. Wiring diagrams showing field-installed wiring, including power, signal, and control wiring.
    f. Shopwork manufacturing instructions.
    g. Templates and patterns.
    h. Schedules.
    i. Design calculations.
    j. Compliance with specified standards.
    k. Notation of coordination requirements.

l. Notation of dimensions established by field measurement.

2. Wiring Diagrams: Differentiate between manufacturer-installed and field-installed wiring.
3. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches (215 by 280 mm) but no larger than 30 by 40 inches (750 by 1000 mm).
4. Submit shop drawings in the following format:
    a. PDF electronic file.

D. Coordination Drawings: Comply with requirements in Specification Section 01 3100 – "Project Management and Coordination".

E. Samples: Prepare physical units of materials or products, including the following:

1. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
2. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from the same material to be used for the Work, cured and finished in manner specified, and physically identical with the 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.
3. Submit Samples for review of kind, color, pattern, and texture for a final check of these characteristics with other elements and for a comparison of these characteristics between final submittal and actual component as delivered and installed.

    a. If variation in color, pattern, texture, or other characteristic is inherent in the product represented by a Sample, submit at least three sets of paired units that show approximate limits of the variations.
    b. Refer to individual Specification Sections for requirements for Samples that illustrate workmanship, fabrication techniques, details of assembly, connections, operation, and similar construction characteristics.

4. Number of Samples for Initial Selection: Submit one full set of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect, through Construction Manager, will return submittal with options selected.
5. Number of Samples for Verification: Submit three (3) sets of Samples. Architect and Construction Manager will retain two Sample sets; remainder will be returned.

    a. Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.

6. 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.
    a. 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.
    b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.

F. Schedule of Values: Comply with requirements in Specification Section 01 3300 - "Payment Procedures."

G. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:

1. Name, address, and telephone number of entity performing subcontract or supplying products.
2. Number and title of related Specification Section(s) covered by Subcontract.
3. Drawing number and detail references, as appropriate, covered by Subcontract.

2.2 INFORMATIONAL SUBMITTALS

A. General: Prepare and submit Informational Submittals required by other Specification Sections Electronically.

1. Certificates and Certifications: Provide a notarized statement that includes signature of Contractor, testing agency, or design professional responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of the company.

B. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

C. Product Certificates: Prepare written statements on manufacturer's letterhead certifying that product complies with requirements.

D. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements. Submit record of Welding Procedure Specification (WPS) and Procedure Qualification Record (PQR) on AWS forms. Include names of firms and personnel certified.

E. Installer Certificates: Prepare written statements on manufacturer's letterhead certifying that Installer complies with requirements and, where required, is authorized for this specific Project.

F. Manufacturer Certificates: Prepare written statements on manufacturer's letterhead certifying that manufacturer complies with requirements. Include evidence of

manufacturing experience where required.

G. Material Certificates: Prepare written statements on manufacturer's letterhead certifying that material complies with requirements.

H. Material Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements.

I. Compatibility Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.

J. Field Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements.

K. Product Test Reports: Prepare written reports indicating current product produced by manufacturer complies with requirements. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.

L. Maintenance Data: Prepare written and graphic instructions and procedures for operation and normal maintenance of products and equipment. Comply with requirements in Division 1 Section "Contract Closeout."

M. Design Data: 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.

N. Manufacturer's Instructions: Prepare written or published information that documents manufacturer's recommendations, guidelines, and procedures for installing or operating a product or equipment. Include name of product and name, address, and telephone number of manufacturer. Include the following, as applicable:

1. Preparation of substrates.
2. Required substrate tolerances.
3. Sequence of installation or erection.
4. Required installation tolerances.
5. Required adjustments.
6. Recommendations for cleaning and protection.

O. Manufacturer's Field Reports: Prepare written information documenting factory-authorized service representative's tests and inspections. Include the following, as applicable:

1. Name, address, and telephone number of factory-authorized service

representative making report.

2. Statement on condition of substrates and their acceptability for installation of product.
3. Statement that products at Project site comply with requirements.
4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
6. Statement whether conditions, products, and installation will affect warranty.
7. Other required items indicated in individual Specification Sections.

P. Insurance Certificates and Bonds: Prepare written information indicating current status of insurance or bonding coverage. Include name of entity covered by insurance or bond, limits of coverage, amounts of deductibles, if any, and term of the coverage.

Q. Material Safety Data Sheets: Submit electronically to the Construction Manager, for filing in the Construction Manager field office. Also maintain a complete set of the Material Safety Data Sheets in the Contractor's field office.

2.3 CONSTRUCTION MANAGER SUBMITTALS

A. Action Schedule: **Within seven (7) days after Notice to Proceed**, each Contractor shall submit a complete submittal and shop drawing schedule. The schedule must list each item to be submitted according to the contract and according to standard practice, and must state the manufacturer, the estimated submittal date, the fabrication and shipment time, and the material delivery date, all as required to maintain the project schedule. This is considered to be an essential and important contract requirement, and as such, no progress payment will be processed until this schedule has been submitted and approved by the Construction Manager.

All other submittals must be submitted within thirty (30) days after the Notice to Proceed.

1. Each submittal shall have a "Submittal Cover Sheet", Construction Manager Form #103 attached with all information completed. Submittals without this cover sheet may be returned for resubmission.
2. Contractors shall provide additional copies of submittals, at no additional cost, upon request of the Construction Manager for purposes of coordination with other Contractors, record drawings, or Owner/Construction Manager use.
3. Approval of a submittal does not imply or indicate approval of any change in a contract requirement. Any item that does not comply with the Contract must be removed from the job and replaced with conforming items, even if the item appears on an "approved" submittal.
4. All Submittals are considered an essential and important contract requirement, and as such, failure to comply with provisions of this paragraph is considered to be a substantial breach of the Contract.

B. Construction Manager's Form #102- Submit Construction Manager's Contract Labor Rate Worksheet prior to first application for payment.

C. Suppliers/Vendor List: Each Contractor must provide a list of the suppliers and vendors they propose to use during this Project.

D. Cash Flow Projection: Each Contractor must provide a cash flow projection for this Project.

E. Construction Schedule: Each Contractor must provide a detailed construction schedule, including fabrication, delivery and field installation of all work included in the Contract.

F. Certificate of Insurance: Each Contractor must have an approved insurance certificate on file with the Construction Manager prior to starting any on site work.

PART 3 – EXECUTION

3.1 CONTRACTOR'S REVIEW

A. Review each submittal and check for compliance with the Contract Documents. Note corrections and field dimensions. (Reference paragraph 3.1B for requirements of approval stamp.) Mark with approval stamp before submitting to the Construction Manager. All submittals shall be issued direct to the Construction Manager for their action.

B. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

C. Every seven (7) days or when requested by the Construction Manager, the Contractors shall submit a comprehensive submittal log which reviews the status of all required submittals.

D. Submittals not complying with the Contract Documents, with the requirements of this section and/or coordinated with other work of this Contract, shall be sent back to the Contractor, without action, to be revised and resubmitted.

3.2 CONSTRUCTION MANAGER ACTION

A. The Construction Manager does not have the authority to approve any submittal.

B. The Construction Manager may review the Contractor's submittals for Contract compliance and coordination. Submittals not complying with the Contract Documents or not properly coordinated may be returned by the Construction Manager to be revised and resubmitted by the Contractor.

3.3 ARCHITECT'S ACTION

A. General: Architect will not review submittals that do not bear Contractor's approval stamp and will return them without action.

B. Action Submittals: Architect reviews each submittal, makes marks to indicate corrections

or modifications required, and returns it. Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action taken, as follows:

1. Stamped Reviewed "No Exceptions Taken":

    a. No corrections or resubmissions required, fabrication may proceed.

2. Stamped Reviewed "Make Corrections Noted":

    a. If Contractor complies with noted corrections, fabrication may proceed and resubmission is not required, unless otherwise noted.
    b. If for any reason the Contractor cannot comply with the noted corrections, fabrication shall not proceed and Contractor shall resubmit, following procedures outlined hereinbefore.

3. Stamped Reviewed "Revise and Resubmit::

    a. Contractor shall revise and resubmit for review. Fabrication shall not proceed.

4. Stamped "Rejected":

    a. Submittal is not in compliance with the Contract Documents, and is not acceptable. Resubmit Contract compliant material.

5. Stamped "For Record Only':

    a. Submittal has been received and will be retained for record keeping purposes.

C. Informational Submittals: Architect and Construction Manager will review each submittal and will not return it, or will reject and return it if it does not comply with requirements. Architect and Construction Manager will forward each submittal to appropriate party.

D. Submittals not required by the Contract Documents will not be reviewed and may be discarded.

END OF SECTION 01 3300

SECTION 01 3510 – SPECIAL PROCEDURES FOR HISTORIC TREATMENT

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including Division 00 and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes special procedures for historic treatment on Project including, but not limited to, the following:

1. Storage and protection of existing historic materials.
2. Temporary protection of historic materials during construction.
3. Protection during application of chemicals.
4. Protection during use of heat-generating equipment.
5. Historic treatment procedures.
6. Removal of bird excrement.

1.3 DEFINITIONS

A. "Preservation": To apply measures necessary to sustain the existing form, integrity, and materials of a historic property. Work may include preliminary measures to protect and stabilize the property.

B. "Rehabilitation": To make possible a compatible use for a property through repair, alterations, and additions while preserving those portions or features that convey its historical, cultural, or architectural values.

C. "Restoration": To accurately depict the form, features, and character of a property as it appeared at a particular period of time by means of the removal of features from other periods in its history and the reconstruction of missing features from the restoration period.

D. "Reconstruction": To reproduce in the exact form and detail a building, structure, or artifact as it appeared at a specific period in time.

E. "Stabilize": To apply measures designed to reestablish a weather-resistant enclosure and the structural reinforcement of an item or portion of the building while maintaining the essential form, as it exists at present.

F. "Protect and Maintain": To remove deteriorating corrosion, reapply protective coatings, and install protective measures such as temporary guards; to provide the least degree of intervention.

G. "Repair": To stabilize, consolidate, or conserve; to retain existing materials and features while employing as little new material as possible. Repair includes patching, piecing-in, splicing, consolidating, or otherwise reinforcing or upgrading materials. Within restoration, repair also includes limited replacement in kind, rehabilitation, and reconstruction, with compatible substitute materials for deteriorated or missing parts of features when there are surviving prototypes.

H. "Replace": To duplicate and replace entire features with new material in kind. Replacement includes the following conditions:

1. Duplication: Includes replacing elements damaged beyond repair or missing. Original material is indicated as the pattern for creating new duplicated elements.
2. Replacement with New Materials: Includes replacement with new material when original material is not available as patterns for creating new duplicated elements.
3. Replacement with Substitute Materials: Includes replacement with compatible substitute materials. Substitute materials are not allowed, unless otherwise indicated.

I. "Remove": To detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or removed and reinstalled.

J. "Remove and Salvage": To detach items from existing construction and deliver them to Owner ready for use.

K. "Remove and Reinstall": To detach items from existing construction, repair and clean them for reuse, and reinstall them where indicated.

L. "Existing to Remain" or "Retain": Existing items of construction that are not to be removed and that are not otherwise indicated to be removed and salvaged, or removed and reinstalled.

M. "Material in Kind": Material that matches existing materials, as much as possible, in species, cut, color, grain, and finish.

1.4 SUBMITTALS

A. Historic Treatment Program: Submit a written plan for each phase or process including protection of surrounding materials during operations. Describe in detail materials, methods, and equipment to be used for each phase of work.

B. Alternative Methods and Materials: If alternative methods and materials to those indicated are proposed for any phase of work, provide a written description including evidence of successful use on other, comparable projects, and program of testing to demonstrate effectiveness for use on this Project.

C. Qualification Data: For historic treatment specialists and supervisory personnel. Include list of completed projects with the scope of work and budget for each.

D. Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including finish surfaces, which might be misconstrued as damage caused by historic treatment operations. Submit before work begins.

E. Record Documents: Include modifications to manufacturer's written instructions and procedures, as documented in the historic treatment preconstruction conference and as the Work progresses.

1.5 QUALITY ASSURANCE

A. Historic Treatment Specialist Qualifications: A firm that employs personnel, including supervisory personnel, experienced and skilled in the processes and operations indicated.

B. Historic Treatment Preconstruction Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination."

1. Review manufacturer's written instructions for precautions and effects of products and procedures on building materials, components, and vegetation.

a. Record procedures established as a result of the review and distribute to affected parties.

1.6 STORAGE AND PROTECTION OF HISTORIC MATERIALS

A. Removed and Salvaged Historic Materials:

1. Clean salvaged historic items.
2. Pack or crate items after cleaning. Identify contents of containers.
3. Store items in a secure area until delivery to Owner.
4. Transport items to Owner's designated storage area.
5. Protect items from damage during transport and storage.
6. Do not dispose of items removed from existing construction without prior written consent of Owner.

B. Removed and Reinstalled Historic Materials:

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

C. Existing Historic Materials to Remain: Protect construction indicated to remain against damage and soiling during historic treatment. When permitted by Architect, items may be removed to a suitable, protected storage location during historic treatment and reinstalled in their original locations after historic treatment operations are complete.

D. Storage and Protection: When removed from their existing location, store historic materials within a weather tight enclosure where they are protected from wetting by rain, snow, or ground water, and temperature variations. Secure stored materials to protect from theft.

1. Identify removed items with an inconspicuous mark indicating their original location.

1.7 PROJECT-SITE CONDITIONS

A. Exterior Cleaning and Repairing:

1. Proceed with the work only when forecasted weather conditions are favorable.

a. Wet Weather: Do not attempt repairs during rainy or foggy weather. Do not apply primer, paint, putty, or epoxy when the relative humidity is above 80 percent. Do not remove exterior elements of structures when rain is forecast or in progress.
b. Do not perform exterior wet work when the air temperature is below 40 deg F (5 deg C).
c. Do not begin cleaning, patching, or repairing when there is any likelihood of frost or freezing.

d. Do not begin cleaning when either the air or the surface temperature is below 45 deg F (7 deg C) unless approved means are provided for maintaining a 45 deg F (7 deg C) temperature of the air and materials during, and for 48 hours subsequent to, cleaning.

2. Perform cleaning and rinsing of the exterior only during daylight hours.

B. Owner may occupy portions of building immediately adjacent to historic treatment area. Conduct historic treatment so Owner's operations will not be disrupted, if Owner occupied. Provide not less than seventy-two (72) hours' notice to Owner of activities that will affect Owner's operations.

PART 2 - PRODUCTS - (Not Used)

PART 3 - EXECUTION

3.1 PROTECTION, GENERAL

A. Comply with manufacturer's written instructions for precautions and effects of products and procedures on adjacent building materials, components, and vegetation.

B. Ensure that supervisory personnel are present when work begins and during its progress.

C. Temporary Protection of Historic Materials during Construction:

1. Protect existing materials during installation of temporary protections and construction. Do not deface or remove existing materials.
2. Attachments of temporary protection to existing construction shall be approved by Architect prior to installation.

D. Protect landscape work adjacent to or within work areas as follows:

1. Provide barriers to protect tree trunks.
2. Bind spreading shrubs.
3. Use coverings that allow plants to breathe and remove coverings at the end of each day. Do not cover plant material with a waterproof membrane for more than 8 hours at a time.
4. Set scaffolding and ladder legs away from plants.

E. Existing Drains: Prior to the start of work or any cleaning operations, test drains and other water removal systems to ensure that drains and systems are functioning properly. Notify Architect immediately of drains or systems that are stopped or blocked. Do not begin Work of this Section until the drains are in working order.

1. Provide a method to prevent solids including stone or mortar residue from entering the drains or drain lines. Clean out drains and drain lines that become blocked or filled by sand or any other solids because of work performed under this Contract.
2. Protect storm drains from pollutants. Block drains or filter out sediments, allowing only clean water to pass.

3.2 PROTECTION DURING APPLICATION OF CHEMICALS

A. Protect persons, motor vehicles, surrounding surfaces of building being restored, building site, plants, and surrounding buildings from harm or damage resulting from applications of chemical cleaners and paint removers.

B. Comply with requirements in Division 1 Section "Temporary Facilities and Controls."

C. Cover adjacent surfaces with materials that are proven to resist chemical cleaners selected for Project unless chemicals being used will not damage adjacent surfaces. Use covering materials that contain only waterproof, UV-resistant adhesives. Apply masking agents to comply with manufacturer's written instructions. Do not apply liquid masking agent to painted or porous surfaces. When no longer needed, promptly remove masking to prevent adhesive staining.

D. Do not clean surfaces during winds of sufficient force to spread cleaning solutions to unprotected surfaces.

E. Neutralize and collect alkaline and acid wastes and dispose of off Owner's property.

F. Dispose of runoff from chemical operations by legal means and in a manner that prevents soil erosion, undermining of paving and foundations, damage to landscaping, and water penetration into building interiors.

3.3 PROTECTION DURING USE OF HEAT-GENERATING EQUIPMENT

A. Comply with the following procedures while performing work with heat-generating equipment, including welding, cutting, soldering, brazing, paint removal with heat, and other operations where open flames or implements utilizing heat are used:

1. Obtain Owner's approval for operations involving use of open-flame or welding equipment.
    a. Notification shall be given for each occurrence and location of work with heat-generating equipment.
2. As far as practical, use heat-generating equipment in shop areas or outside the building.
3. Before work with heat-generating equipment commences, furnish personnel to serve as a fire watch (or watches) for location(s) where work is to be performed.
4. Do not perform work with heat-generating equipment in or near rooms or in areas where flammable liquids or explosive vapors are present or thought to be present. Use a combustible gas indicator test to ensure that the area is safe.
5. Remove and keep the area free of combustibles, including, rubbish, paper, waste, etc., within area of operations.
    a. If combustible material cannot be removed, provide fireproof blankets to cover such materials.
6. Where possible, furnish and use baffles of metal or gypsum board to prevent the spraying of sparks or hot slag into surrounding combustible material.
7. Prevent the extension of sparks and particles of hot metal through open windows, doors, holes, and cracks in floors, walls, ceilings, roofs, and other openings.
8. Inspect each location of the day's work not sooner than 30 minutes after completion of operations to detect hidden or smoldering fires and to ensure that proper housekeeping is maintained.

B. Where sprinkler protection exists and is functional, maintain it without interruption while operations are being performed. If operations are performed close to automatic sprinkler heads, shield the individual heads temporarily with guards.

3.4 HISTORIC TREATMENT PROCEDURES

A. The principal aim of preservation work is to halt the process of deterioration and stabilize the item's condition, unless otherwise indicated. Repair is required where specifically indicated. The following procedures shall be followed:

1. Retain as much existing material as possible; repair and consolidate rather than replace.
2. Use additional material or structure to reinforce, strengthen, prop, tie, and support existing material or structure.
3. Use reversible processes wherever possible.
4. Use traditional replacement materials and techniques. New work shall be distinguishable to the trained eye, on close inspection, from old work.
5. Record the work before the procedure with preconstruction photos and during the work with periodic construction photos.

B. Prohibit smoking by personnel performing work on or near historic structures.

C. Obtain Architect's review and written approval in the form of a Constructive Change Directive or Supplemental Instruction before making changes or additions to construction or removing historic materials.

D. Notify Architect of visible changes in the integrity of material or components whether due to environmental causes including biological attack, UV degradation, freezing, or thawing; or due to structural defects including cracks, movement, or distortion.

1. Do not proceed with the work in question until directed by Architect.

E. Where missing features are indicated to be repaired or replaced, provide features whose designs are based on accurate duplications rather than on conjectural designs, subject to the approval of Architect and/or Preservation Specialist.

F. Where Work requires existing features to be removed, cleaned, and reused, perform these operations without damage to the material itself, to adjacent materials, or to the substrate.

G. Identify new or replacement materials and features with inconspicuous, permanent marks to distinguish them from original materials. Record the legend of identification marks and the locations of these marks on Record Drawings.

H. When cleaning, match samples of existing materials that have been cleaned and identified for acceptable cleaning levels. Avoid over cleaning to prevent damage to existing materials during cleaning.

3.5 REMOVAL OF BIRD EXCREMENT

A. General: Before disturbing accumulated bird excrement, consult with an occupational medicine physician, industrial hygienist, and authorities having jurisdiction to determine acceptable removal

procedures and appropriate protective measures for personnel.

B. Removing Bird Excrement: Treat bird excrement before its removal as required by authorities having jurisdiction.

1. Prior to removal, dampen excrement to prevent it from becoming airborne.
2. Use only nonmetallic tools (plastic spatulas and brushes with natural fiber or nylon bristles, or their equivalent) to remove excrement.
3. Collect removed excrement and legally disposed of off site.
4. Perform bird excrement removal work from the outside of the building with windows and other openings in the building closed.

END OF SECTION 01 3510

SECTION 01 7200 - OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. Drawings and general provisions of the Contract, including Division 00 and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY:

A. This Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:

1. Operation and maintenance documentation directory.
2. Emergency manuals.
3. Operation manuals for systems, subsystems, and equipment.
4. Maintenance manuals for the care and maintenance of products, materials, finishes, systems and equipment.

B. Related Sections include the following:

1. Division 1 Section "Submittal Procedures" for submitting copies of submittals for operation and maintenance manuals.
2. Division 1 Section "Closeout Procedures" for submitting operation and maintenance manuals.
3. Division 1 Section "Project Record Documents" for preparing Record Drawings for operation and maintenance manuals.
4. Divisions 3 through 33 Sections for specific operation and maintenance manual requirements for products in those Sections.

1.3 DEFINITIONS:

A. System: An organized collection of parts, equipment, or subsystems united by regular interaction.

B. Subsystem: A portion of a system with characteristics similar to a system.

1.4 SUBMITTALS:

A. Initial Submittal: Submit 2 draft copies of each manual at least 15 days before requesting inspection for Substantial Completion. Include a complete operation and maintenance directory. Architect will return 1 copy of draft and mark whether general scope and content of manual are acceptable.

B. Final Submittal: Submit 1 copy of each manual in final form at least 15 days before final inspection. Architect will return copy with comments within 15 days after final inspection.

1. Correct or modify each manual to comply with Architect's comments. Submit 3 copies of each corrected manual within 15 days of receipt of Architect's comments.

1.5 COORDINATION:

A. Where operation and maintenance documentation includes information on installations by more than one factory-authorized service representative, assemble and coordinate information furnished by representatives and prepare manuals.

PART 2 - PRODUCTS

2.1 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY:

A. Organization: Include a section in the directory for each of the following:

1. List of documents.
2. List of systems.
3. List of equipment.
4. Table of contents.

B. List of Systems and Subsystems: List systems alphabetically. Include references to operation and maintenance manuals that contain information about each system.

C. List of Equipment: List equipment for each system, organized alphabetically by system. For pieces of equipment not part of system, list alphabetically in separate list.

D. Tables of Contents: Include a table of contents for each emergency, operation, and maintenance manual.

E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with the same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

2.2 MANUALS, GENERAL:

A. Organization: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:

1. Title page.
2. Table of contents.
3. Manual contents.

B. Title Page: Enclose title page in transparent plastic sleeve. Include the following information:

1. Subject matter included in manual.
2. Name and address of Project.
3. Name and address of Owner.
4. Date of submittal.
5. Name, address, and telephone number of Contractor.
6. Name and address of Architect.
7. Cross-reference to related systems in other operation and maintenance manuals.

C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.

1. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.

D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.

1. Binders: Heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch (115-by-280-mm) paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.

a. If two or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by subsystem and related components. Cross-reference other binders if necessary to provide essential information for proper operation or maintenance of equipment or system.
b. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter of contents. Indicate volume number for multiple-volume sets.

2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.
3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software diskettes for computerized electronic equipment.
4. Supplementary Text: Prepared on 8-1/2-by-11-inch (115-by-280-mm), 20-lb/sq. ft. (75-g/sq. m) white bond paper.
5. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.

a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

2.3 EMERGENCY MANUALS:

A. Content: Organize manual into a separate section for each of the following:

1. Type of emergency.
2. Emergency instructions.
3. Emergency procedures.

B. Type of Emergency: Where applicable for each type of emergency indicated below, include instructions and procedures for each system, subsystem, piece of equipment, and component:

1. Fire.
2. Flood.

3. Gas leak.
4. Water leak.
5. Power failure.
6. Water outage.
7. System, subsystem, or equipment failure.
8. Chemical release or spill.

C. Emergency Instructions: Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of Owner's operating personnel for notification of Installer, supplier, and manufacturer to maintain warranties.

D. Emergency Procedures: Include the following, as applicable:

1. Instructions on stopping.
2. Shutdown instructions for each type of emergency.
3. Operating instructions for conditions outside normal operating limits.
4. Required sequences for electric or electronic systems.
5. Special operating instructions and procedures.

2.4 OPERATION MANUALS:

A. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:

1. System, subsystem, and equipment descriptions.
2. Performance and design criteria if Contractor is delegated design responsibility.
3. Operating standards.
4. Operating procedures.
5. Operating logs.
6. Wiring diagrams.
7. Control diagrams.
8. Piped system diagrams.
9. Precautions against improper use.
10. License requirements including inspection and renewal dates.

B. Descriptions: Include the following:

1. Product name and model number.
2. Manufacturer's name.
3. Equipment identification with serial number of each component.
4. Equipment function.
5. Operating characteristics.
6. Limiting conditions.
7. Performance curves.
8. Engineering data and tests.
9. Complete nomenclature and number of replacement parts.

C. Operating Procedures: Include the following, as applicable:

1. Startup procedures.
2. Equipment or system break-in procedures.
3. Routine and normal operating instructions.
4. Regulation and control procedures.
5. Instructions on stopping.
6. Normal shutdown instructions.

7. Seasonal and weekend operating instructions.
8. Required sequences for electric or electronic systems.
9. Special operating instructions and procedures, including economy and efficiency adjustments.
10. Effective energy utilization.

D. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.

E. Piped Systems: Diagram piping as installed, and identify color-coding where required for identification.

2.5 PRODUCT MAINTENANCE MANUAL:

A. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.

B. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.

C. Product Information: Include the following, as applicable:

1. Product name and model number.
2. Manufacturer's name.
3. Color, pattern, and texture.
4. Material and chemical composition.
5. Reordering information for specially manufactured products.

D. Maintenance Procedures: Include manufacturer's written recommendations and the following:

1. Inspection procedures.
2. Types of cleaning agents to be used and methods of cleaning.
3. List of cleaning agents and methods of cleaning detrimental to product.
4. Schedule for routine cleaning and maintenance.
5. Repair instructions.

E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.

F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

1. Include procedures to follow and required notifications for warranty claims.

2.6 SYSTEMS AND EQUIPMENT MAINTENANCE MANUAL:

A. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.

B. Source Information: List each system, subsystem, and piece of equipment included in the

manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.

C. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:

1. Standard printed maintenance instructions and bulletins.
2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
3. Identification and nomenclature of parts and components.
4. List of items recommended to be stocked as spare parts.

D. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:

1. Test and inspection instructions.
2. Troubleshooting guide, including noise and vibration adjustments.
3. Precautions against improper maintenance.
4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
5. Aligning, adjusting, and checking instructions.
6. Demonstration and training videotape, if available.

E. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.

1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.

F. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.

G. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.

H. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

1. Include procedures to follow and required notifications for warranty claims.

PART 3 - EXECUTION

3.1 MANUAL PREPARATION:

A. Operation and Maintenance Documentation Directory: Prepare a separate manual that provides an organized reference to emergency, operation, and maintenance manuals.

B. Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by Owner's operating personnel for types of emergencies indicated.

C. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.

D. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.

1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.

E. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.

1. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.

F. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in Record Drawings to ensure correct illustration of completed installation.

1. Do not use original Project Record Documents as part of operation and maintenance manuals.
2. Comply with requirements of newly prepared Record Drawings in Division 1 Section "Project Record Documents."

G. Reference Specification Section 017300 for Electronic submission requirements for operation and maintenance data.

H. Comply with Division 1 Section "Closeout Procedures" for the schedule for submitting operation and maintenance documentation.

END OF SECTION 01 7200

SECTION 01 4300 - QUALITY CONTROL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. Drawings and general provisions of the Contract, including Division 00 and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY:

A. Administrative and procedural requirements for quality assurance, special testing, and quality control.

B. The requirements of this Section apply to customized fabrication and installation procedures, not to the production of standard products.

C. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.

1. Specific quality-control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
2. Specified tests, inspections, and related actions do not limit Contractor's quality-control procedures that facilitate compliance with the Contract Document requirements.
3. Requirements for Contractor to provide quality-control services required by Architect, Owner, or authorities having jurisdiction are not limited by provisions of this Section.

D. Related Sections include the following:

1. Division 1 Section "Special Inspections."
2. Division 1 Section "Allowances" for testing and inspecting allowances.
3. Division 1 Section "Construction Progress Documentation" for developing a schedule of required tests and inspections.
4. Division 1 Section "Cutting and Patching" for repair and restoration of construction disturbed by testing and inspecting activities.
5. Divisions 2 through 33 Sections for specific test and inspection requirements.

1.3 DEFINITIONS:

A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and ensure that proposed construction complies with requirements.

B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that completed construction complies with requirements. Services do not include contract enforcement activities performed by Architect.

C. Mockups: Full-size, physical example assemblies to illustrate finishes and materials. Mockups 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. Mockups establish the standard by which the Work will be judged.

D. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.

1.4 DELEGATED DESIGN:

A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.

1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect through the Construction Manager.

1.5 SUBMITTALS:

A. Qualification Data: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.

B. Delegated-Design Submittal: In addition to Shop Drawings, Product Data, and other required submittals, submit a statement, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional, indicating that the products and systems are in compliance with performance and design criteria indicated. Include list of codes, loads, and other factors used in performing these services.

C. Schedule of Tests and Inspections: Prepare in tabular form and include the following:

1. Specification Section number and title.
2. Description of test and inspection.
3. Identification of applicable standards.
4. Identification of test and inspection methods.
5. Number of tests and inspections required.
6. Time schedule or time span for tests and inspections.
7. Entity responsible for performing tests and inspections.
8. Requirements for obtaining samples.
9. Unique characteristics of each quality-control service.

D. Reports: Prepare and submit daily certified written reports for each inspection and test. Written reports shall include the following:

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.
7. Identification of product and Specification Section.
8. Complete test or inspection data in accordance with applicable standards.
9. Test and inspection results and an interpretation of test results.

10. Comments or professional opinion as to whether inspected or tested work complies with requirements of the Contract Documents.
11. Ambient conditions at time of sample taking and testing and inspecting.
12. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
13. Name and signature of laboratory inspector.
14. Recommendations on retesting and reinspecting.

E. Submit to Architect 3 copies of certified written report of each inspection, test or similar service.

1. Provide additional copies of reports, as required for authorities having jurisdiction, to the Architect for distribution, through the Construction Manager.
2. Provide required number of copies to the Contractor for his record.

F. 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.

1.6 REQUIREMENTS:

A. Inspection and testing services are intended to verify compliance with the requirements of the Contract Documents.

B. Quality control services do not relieve the Contractor of responsibility for compliance with requirements of the Contract Documents. Requirements for the Contractor to provide quality control services are not limited by the provisions of this Section.

C. Quality control services include inspections and tests and related actions including reports, performed by independent agencies and governing authorities, as well as by the Contractor. They do not include Contract interpretations and decisions rendered by the Architect.

D. Specific quality control requirements for an individual unit of work is specified in the Section of the Specifications that includes that element of the Work. These requirements, including inspections and tests, cover both production of standard products, and fabrication of customized work. These requirements also cover quality control of the installation procedures.

E. Inspections, tests and related actions specified are not intended to limit the Contractor's own quality control procedures which facilitate overall compliance with requirements of the Contract Documents.

1.7 RESPONSIBILITIES AND LIMITS OF RESPONSIBILITY:

A. The Contractor shall provide inspections, tests and similar quality control services, specified in individual Specification Sections and required by governing authorities, except where they are specifically indicated to be the Owner's responsibility, or are provided by another identified entity.

B. These control services include those specified to be performed by an independent agency and not by the Contractor. Costs for these services shall be included in the Contract Sum.

C. The Construction Manager shall employ and pay an independent agency to perform specified quality control services.

D. The Testing Agency, Special Inspector or Testing Laboratory shall cooperate with Construction Manager, Architect and Subcontractor in performance of duties and provide qualified personnel to perform required tests and inspections.

E. The Testing Agency, Special Inspector or Testing Laboratory shall interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.

F. The Testing Agency, Special Inspector or Testing Laboratory will retest and re-inspect corrected work, at the Subcontractor's expense.

G. The Testing Agency, Special Inspector or Testing Laboratory shall not perform any duties of the Subcontractor.

H. The Testing Agency, Special Inspector or Testing Laboratory shall not be responsible for construction site safety.

I. The Testing Agency, Special Inspector or Testing Laboratory has no authority to stop the work.

J. The Testing Agency, Special Inspector and Testing Laboratory shall disclose any past or present business relationship or potential conflict of interest with the Subcontractor or any of the Subcontractors whose work will be inspected or tested.

K. The Testing Agency, Special Inspector or Testing Laboratory may not release, revoke, alter, or enlarge on the requirements of the Contract Documents.

L. The Testing Agency, Special Inspector or Testing Laboratory will not have control over the Subcontractor's means and methods of construction.

1.8 RETESTING:

A. The Contractor is responsible for retesting where results of required inspections, tests or similar services prove unsatisfactory and do not indicate compliance with Contract Document requirements, regardless of whether the original test was the Contractor's responsibility.

B. Cost of retesting construction revised or replaced by the Contractor is the Contractor's responsibility, where required tests were performed on original construction.

1.9 ASSOCIATED SERVICES:

A. The Contractor shall cooperate with agencies performing required inspections, tests and similar services and shall provide reasonable auxiliary services as requested.

B. Notify the testing agency sufficiently in advance of operations to permit assignment of personnel.

C. Auxiliary services required include but are not limited to:

1. Providing access to the Work and furnishing the incidental labor and facilities necessary to facilitate inspections and tests.
2. Taking adequate quantities of representative samples of materials that require testing or assisting the agency in taking samples.

3. Providing facilities for storage and curing of test samples, and delivery of samples to testing laboratories.
4. Providing the testing agency with a preliminary design mix proposed for use for material mixes that require control by the testing agency.
5. Security and protection of samples and test equipment at the Project site.

1.10 COORDINATION:

A. The Contractor shall coordinate the sequence of activities to accommodate required inspection and test services with a minimum of delay.

B. The Contractor shall coordinate activities to avoid the necessity of removing and replacing construction to accommodate inspections and tests.

C. The Contractor shall be responsible for scheduling inspections, tests, taking of samples and similar activities.

D. The Contractor shall bear costs of removing and replacing work to accommodate scheduled inspections and tests.

1.11 QUALITY ASSURANCE:

A. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

B. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

C. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

D. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance.

E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar to those indicated for this Project in material, design, and extent.

F. Specialists: Certain sections of the Specifications require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.

1. Requirement for specialists shall not supersede building codes and similar regulations governing the Work, nor interfere with local trade-union jurisdictional settlements and similar conventions.

G. Testing Agency Qualifications: An agency with the experience and capability to conduct testing and inspecting indicated, as documented by ASTM E 548, and that specializes in types

of tests and inspections to be performed.

H. Preconstruction Testing: Testing agency shall perform preconstruction testing for compliance with specified requirements for performance and test methods.

1. Contractor responsibilities include the following:

a. Provide test specimens and assemblies representative of proposed materials and construction. Provide sizes and configurations of assemblies to adequately demonstrate capability of product to comply with performance requirements.
b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
c. Fabricate and install test assemblies using installers who will perform the same tasks for Project.
d. When testing is complete, remove assemblies; do not reuse materials on Project.

2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Architect, through the Construction Manager, with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.

I. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:

1. Build mockups in location and of size indicated or, if not indicated, as directed by Architect.
2. Notify Architect a minimum of seven days in advance of dates and times when mockups will be constructed.
3. Demonstrate the proposed range of aesthetic effects and workmanship.
4. Obtain Architect's approval of mockups before starting work, fabrication, or construction.
5. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
6. Demolish and remove mockups when directed, unless otherwise indicated.

1.12 QUALITY CONTROL:

A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.

1. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.

B. Contractor Responsibilities: Unless otherwise indicated, provide quality-control services specified and required by authorities having jurisdiction.

1. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.

a. Contractor shall not employ the same entity engaged by Owner, unless agreed to in writing by Owner.

2. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
3. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
6. Work which fails to comply with the requirements of the contract documents or work which has not been inspected must be immediately removed and replaced at the contractors cost.

C. Special Tests and Inspections: Owner will engage a testing agency to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner.

1. Testing agency will notify Architect and Construction Manager promptly of irregularities and deficiencies observed in the Work during performance of its services.
2. Testing agency will submit a certified written report of each test, inspection, and similar quality-control service to Architect with copy to Construction Manager, Engineer of Record, Owner and authorities having jurisdiction. Submit reports within seven (7) days of the inspection or test. Hand written reports may be submitted prior to final typed copies being available.
3. Testing agency will submit a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies. Provide a statement that all appropriate and required inspections and tests were performed with a complete composite report and summary to the Owner, Architect, Engineer of Record and Construction Manager.
4. Testing agency will interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.
5. Testing agency will retest and reinspect corrected work.

D. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing.

E. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that revised or replaced Work that failed to comply with requirements established by the Contract Documents.

F. Testing Agency Responsibilities: Cooperate with Architect and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.

1. Notify Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
2. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
3. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
4. Do not release, revoke, alter, or increase requirements of the Contract Documents or approve or accept any portion of the Work.
5. Do not perform any duties of Contractor.

G. Associated Services: Cooperate with agencies performing required tests, inspections, and

similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:

1. Access to the Work.
2. Incidental labor and facilities necessary to facilitate tests and inspections.
3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
4. Facilities for storage and field-curing of test samples.
5. Delivery of samples to testing agencies.
6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
7. Security and protection for samples and for testing and inspecting equipment at Project site.

H. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and quality-control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.

1. Schedule times for tests, inspections, obtaining samples, and similar activities.

I. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents. Submit schedule within 30 days of date established for the Notice to Proceed.

1. Distribution: Distribute schedule to Owner, Architect, testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required. Required inspections and tests are described in the individual Specification Sections for the items to be inspected and/or the "Schedule of Special Inspections", which is attached to the end of this Section.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 REPAIR AND PROTECTION:

A. Upon completion of inspection, testing, sample-taking and similar services, repair damaged construction and restore substrates and finishes to eliminate resulting imperfections, including flaws in visual qualities of finishes.

1. Provide materials and comply with installation requirements specified in other Sections of these Specifications. Restore patched areas and extend restoration into adjoining areas in a manner that eliminates evidence of patching.

B. Comply with the Contract Document requirements for cutting and patching.

C. Protect construction exposed by or for quality-control service activities.

D. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 01 4300

SECTION 01 5200 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. Drawings and general provisions of the Contract, including Division 00 and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY:

A. This Section includes:
1. Temporary utilities and controls, and support facilities required during construction.
2. Provisions for safety and security, and protection of facilities during construction.

B. Temporary utilities include, but are not limited to, the following:
1. Sewers and drainage.
2. Water service and distribution.
3. Sanitary facilities, including toilets, wash facilities, and drinking-water facilities.
4. Heating and cooling facilities.
5. Ventilation.
6. Electric power service.
7. Lighting.
8. Telephone service.

C. Support facilities include, but are not limited to, the following:
1. Temporary roads and paving.
2. Dewatering facilities and drains.
3. Project identification and temporary signs.
4. Waste disposal facilities.
5. Field offices.
6. Storage and fabrication sheds.
7. Lifts and hoists.
8. Temporary elevator usage.
9. Temporary stairs.
10. Construction aids and miscellaneous services and facilities.

D. Security and protection facilities include, but are not limited to, the following:
1. Environmental protection.
2. Stormwater control.
3. Tree and plant protection.
4. Pest control.
5. Site enclosure fence.
6. Security enclosure and lockup.
7. Barricades, warning signs, and lights.
8. Covered walkways.
9. Temporary enclosures.
10. Temporary partitions.
11. Fire protection.

E. Related Sections include the following:
1. Division 1 Section "Summary of Multiple Contracts" for division of responsibilities for temporary facilities and controls.
2. Division 1 Section "Submittal Procedures" for procedures for submitting copies of implementation and termination schedule and utility reports.

3. Division 1 Section "Execution Requirements" for progress cleaning requirements.
4. Division 2 Section "Dewatering" for disposal of ground water at Project site.
5. Divisions 2 through 33 for temporary heat, ventilation, and humidity requirements for products in those Sections.

1.3 QUALITY ASSURANCE AND SAFETY:

A. Regulations: Comply with industry standards and applicable laws and regulations of authorities having jurisdiction, including but not limited to:
1. Building Codes, including local requirements for permits, testing and inspection.
2. Health and safety regulations.
3. Utility company regulations.
4. Police and Fire Department rules and recommendations.
5. Rescue Squad recommendations.
6. Environmental Protection Agency regulations.

B. Standards: Comply with:
1. NFPA Code 241, Building Construction and Demolition Operations.
2. ANSI-A10 Series standards for Safety Requirements for Construction and Demolition.
3. NECA National Joint Guideline NJG-6 Temporary Job Utilities and Services.
4. NFPA 70 National Electric Code.
5. Williams-Steiger Occupational Safety and Health Act.
6. Manual of Accident Prevention in Construction of the Association of General Contractors of America.

C. Inspections:
1. Inspect and test each service before placing temporary utilities in use.
2. Arrange for required inspections and tests by governing authorities for each temporary utility before use. Obtain required certifications and permits and submit to the Construction Manager.

D. Promotion of Safety:
1. Designate a representative at the job site to be responsible for the promotion of safety and prevention of accidents, and the enforcement of applicable laws, regulations and standards pertaining to safety and accident prevention.
2. Hold periodic meetings with representatives of various trades employed at the job site to ensure that employees understand and comply with laws, regulations, and standards.

1.4 SUBMITTALS:

A. Temporary Utilities: Submit reports of tests, inspections, meter readings and similar procedures performed on temporary utilities.

B. Implementation and Termination Schedule: Submit a schedule indicating implementation and termination of each temporary utility within 15 days of the date established for commencement of the Work.

1.5 PROJECT CONDITIONS:

A. Maintain, expand as required and modify temporary services and facilities as needed throughout the progress of the work.

B. Operate temporary services and facilities in a safe and efficient manner. Do not overload temporary services or facilities, and do not permit them to interfere with the progress of the Work.

C. Keep temporary facilities clean and neat in appearance. Do not allow unsanitary conditions, public nuisances or hazardous conditions to develop or persist on the site.

D. At the earliest feasible time, and when acceptable to the Owner and Architect, change over from the use of temporary utility service to the use of the permanent service, to enable removal of the temporary utility and to eliminate possible interference with completion of the Work.
   1. Temporary Use of Permanent Facilities: Installer of each permanent service shall assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.
   2. Relocate temporary services and facilities as required by progress of the Work.

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT:

A. Provide materials and equipment that are recognized as being suitable for the intended use by compliance with appropriate standards and applicable codes.

B. Where local utility company provides only a portion of the temporary utility, provide the remainder with matching, compatible materials and equipment. Comply with the utility company's recommendations.

C. Equipment:
   1. Water hoses: Provide 3/4 inch heavy-duty abrasion-resistant hoses with a pressure rating greater than the maximum pressure of the water distribution system. Provide adjustable shut-off nozzles at hose discharge.
   2. Electrical Service: Comply with applicable NEMA, NECA and UL standards and governing regulations for materials and layout of temporary electric service including requirements in Division 26 Sections.
   3. Lamps and Light Fixtures: Provide general service incandescent lamps, with guard cages, of wattage indicated or required for adequate illumination. Provide exterior fixtures where exposed to the weather or moisture.
   4. First Aid Supplies: Comply with governing regulations.
   5. Fire Extinguishers:
      a. Provide hand-carried, portable UL-rated, class "ABC" dry chemical extinguishers, or a combination of extinguishers of NFPA recommended classes for the conditions of exposure.
      b. Comply with NFPA 10 and 241 for classification, extinguishing agent and size required by location and class of fire exposure.
   6. General: Provide new equipment. If acceptable to the Construction Manager, the Contractor may use undamaged, previously used equipment in serviceable condition. Provide equipment suitable for use intended.
   7. Self-Contained Toilet Units: Provide single-occupant units of chemical, aerated recirculation, or combustion type; vented; fully enclosed with a glass-fiber-reinforced polyester shell or similar nonabsorbent material.
   8. Temporary Offices: Provide prefabricated or mobile units or similar job-built construction with lockable entrances, operable windows and serviceable stairs and finishes. Provide heated and air-conditioned units on foundations adequate for normal loading.
   9. Drinking-Water Fixtures: Containerized, tap-dispenser, bottled-water, drinking-water units, including paper cup supply.
   10. Heating Equipment: Unless Owner authorizes use of permanent heating system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.

a. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
b. Heating Units: Listed and labeled, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use for type of fuel being consumed.

11. Electrical Outlets: Provide properly configured, NEMA-polarized outlets to prevent insertion of 110- to 120-V plugs into higher-voltage outlets; equipped with ground-fault circuit interrupters, reset button, and pilot light for connection of power tools.
12. Electrical Power Cords: Provide grounded extension cords. Use hard-service cords where exposed to abrasion and traffic. Provide waterproof connectors to connect separate lengths of electric cords if single lengths will not reach areas where construction activities are in progress. Do not exceed safe length voltage ratio.

D. Materials:

1. Lumber and Plywood:
   a. Comply with requirements of Carpentry Section.
   b. For job-built temporary offices, shops and sheds within the construction area, provide UL labeled, fire treated lumber and plywood for framing, sheathing and siding. Comply with NFPA 241.
   c. For signs and directory boards, provide exterior type, Grade B-B High Density Concrete Form Overlay Plywood conforming to PS-1, of sizes and thickness indicated.
   d. For vision barriers, provide exterior type, minimum ½" inch thick plywood.
   e. For safety barriers and similar uses, provide minimum ¾" inch thick exterior plywood.

2. Roofing Materials: Provide UL Class "A" standard weight asphalt shingles complying with ASTM D 3018, or UL Class "C" mineral surfaced roll roofing complying with ASTM D 249 on roofs of job-built temporary offices, shops and sheds.

3. Paint: Comply with requirements of Section on Painting.
   a. For job-built temporary offices, shops, sheds, barriers, fences and other exposed lumber and plywood, provide exterior grade acrylic-latex emulsion over exterior primer.
   b. For sign panels and applying graphics, provide exterior grade alkyd gloss enamel over exterior primer for painting panels and for lettering.
   c. For interior walls of temporary offices, if unfinished, provide two coats interior latex flat wall paint.

4. Protective Coverings:
   a. Provide waterproof, fire-resistant, UL labeled tarpaulin covers with flame-spread rating of 15 or less.
   b. For temporary enclosures provide translucent nylon reinforced laminated polyethylene or polyvinyl chloride fire retardant tarpaulins to allow maximum daylight.

5. Water: Provide drinkable water approved by local health authorities.
6. Chain-Link Fencing: Minimum 2-inch, 0.148-inch- thick, galvanized steel, chain-link fabric fencing; minimum 6 feet high with galvanized steel 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.
7. Gypsum Board: Minimum 1/2 inch thick by 48 inches wide by maximum available lengths; regular-type panels with tapered edges. Comply with ASTM C 36.
   a. Provide Gypsum Wall Board on the interior walls of temporary offices.

8. Insulation: Unfaced mineral-fiber blanket, manufactured from glass, slag wool, or rock wool; with maximum flame-spread and smoke-developed indices of 25 and 50, respectively.

E. Temporary Soil Erosion Control:

1. Mulches - straw, fiber mats, netting, wood cellulose, corn or tobacco stalks, bark, corn cobs, wood chips or other suitable material acceptable to the Architect and reasonably clean and free of weeds and harmful materials.
2. Slope Drains - constructed of pipe, fiber mats, rubble, portland cement concrete, bituminous concrete, plastic sheets or other material acceptable to the Architect and adequate for erosion control.
3. Grass - Rye grass or other quick growing species suitable to the area and as a temporary cover which will not compete with the grasses sown later for permanent cover.
4. Fertilizer and soil conditioners - standard commercial grades acceptable to the Architect.
5. Hay Bales - standard size bales of hay or straw, having no loose or decomposed baling twine. Use 2 inch by 2 inch by 3 foot staking, pointed on one end to secure bales.

F. Self-Contained Toilet Units: Single-occupant units of chemical, aerated recirculation, or combustion type; vented; fully enclosed with a glass-fiber-reinforced polyester shell or similar nonabsorbent material.

G. Drinking-Water Fixtures: Containerized, tap-dispenser, bottled-water drinking-water units, including paper cup supply.
1. Where power is accessible, provide electric water coolers to maintain dispensed water temperature at 45 to 55 deg F.

H. Heating Equipment: Unless Owner authorizes use of permanent heating system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.
1. Provide temporary heating units that have been tested and labeled by UL, FM or other recognized trade association for the type of fuel being used.
2. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
3. Heating Units: Listed and labeled, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use for type of fuel being consumed.

PART 3 - EXECUTION

3.1 INSTALLATION:

A. Locate temporary facilities to adequately serve the Project and to cause minimum interference with performance of the Work.

B. Relocate, modify and extend temporary facilities to accommodate Work as it progresses. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.2 UTILITY USE CHARGES:

A. General: Cost or use charges for temporary facilities are not chargeable to Owner or Architect and shall be included in the Contract Sum. Allow other entities to use temporary services and facilities without cost, including, but not limited to, the following:
1. Owner's construction forces.

2. Occupants of Project.
3. Architect.
4. Testing agencies.
5. Personnel of authorities having jurisdiction.

3.3 TEMPORARY UTILITY INSTALLATION:

A. General: Engage appropriate local utility company to install temporary service or connect to existing service. Where utility company provides only part of the service, provide the remainder with matching, compatible materials and equipment. Comply with utility company recommendations.
   1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
   2. Provide adequate capacity at each stage of construction. Before temporary utility is available, provide trucked-in services.
   3. Obtain easements to bring temporary utilities to Project site where Owner's easements cannot be used for that purpose.

3.4 WATER SERVICE:

A. Use of Owner's existing water service facilities will be permitted, as long as facilities are cleaned and maintained in a condition acceptable to Owner.
   1. Provide rubber hoses as necessary to serve Project site.
   2. As soon as water is required at each level, extend service to form a temporary water- and fire-protection standpipe. Provide distribution piping of sizes and pressures adequate for service during the construction period and until permanent plumbing service is in use.

      Space outlets so water can be reached with a 100-foot (30-m) hose. Provide one hose at each outlet.
   3. Where installations below an outlet might be damaged by spillage or leakage, provide a drip pan of suitable size to minimize water damage. Drain accumulated water promptly from pans.
   4. Provide pumps to supply a minimum of 30-psi static pressure at highest point. Equip pumps with surge and storage tanks and automatic controls to supply water uniformly at reasonable pressures.

B. Exercise control over usage in the interest of conservation.

C. Sterilize temporary water piping prior to use.

3.5 TEMPORARY ELECTRIC POWER SERVICE:

A. Provide weatherproof, grounded temporary electric power service and distribution system of sufficient size, capacity, and power characteristics to accommodate performance of work during the construction period.

B. Include necessary meters, transformers, overload protected disconnects, automatic ground fault interrupts, and main distribution switch gear.

C. Connect temporary service to the local electric power company main in the manner directed by company officials.

D. Electric Power Service: Use electric power from Owner's existing system without metering and without payment of use charges.

E. Exercise control over power usage to conserve energy.

3.6 POWER DISTRIBUTION SYSTEM:

A. Provide circuits of adequate size and proper characteristics for each use. In general run wiring overhead, and rise vertically where wiring will be the least exposed to damage from construction operations.

B. Provide rigid steel conduit or equivalent raceways for wiring which must be exposed on grade, floors, decks or other areas of possible traffic damage.

C. Provide metal conduit, tubing or armored cable for protection of temporary power wiring where exposed to possible damage during construction operations.

D. Where permitted by code, wiring of circuits not exceeding 110-120 Volt 20 Amp rating, and wiring of lighting circuits may be non-metallic sheathed cable in areas where located overhead and exposed for surveillance. Provide metal enclosures or boxes for wiring devices.

E. Provide overload-protected disconnect switch for each temporary circuit and each temporary lighting circuit, located at the power distribution center.

F. For power hand tools and task lighting, provide temporary 4-gang outlets spaced so that a 100 foot extension cord can reach each area of work.
   1. Provide waterproof connectors to connect separate lengths of electrical power cords if single lengths will not reach areas where construction activities are in progress. Do not exceed safe length-voltage ratio.
   2. Provide warning signs at power outlets other than 110 to 120 V.
   3. Provide 4-gang outlets, spaced so 100-foot extension cord can reach each area for power hand tools and task lighting. Provide a separate 125-V ac, 20-A circuit for each outlet.

3.7 TEMPORARY LIGHTING:

A. Provide local switching of temporary lighting, spaced to allow lighting to be turned off in patterns to conserve energy and retain light suitable for work-in-progress, access traffic, security check and project lock-up.

B. Provide not less than one 100 watt incandescent lamp per 500 square feet of floor area, uniformly distributed, for general construction lighting, or equivalent illumination of a similar nature.

C. In corridors and similar traffic areas, provide one 100-watt incandescent lamp every 50 feet. In stairways and at ladder runs, provide one 100 watt incandescent lamp minimum, located to illuminate each flight and landing.

D. Lighting levels in all areas shall meet or exceed standards required by O.S.H.A.

E. Install and operate temporary lighting that will adequately illuminate construction operations and traffic areas and will meet security and protection requirements, without the necessity of operating the entire system.

F. Temporary Exterior Lighting: Install exterior site lights so signs and construction Work area are visible at night.

3.8 TEMPORARY TELEPHONES:

A. Arrange for the local telephone company to install temporary service to the Project.

B. Service shall provide, as a minimum, emergency communications between all telephone locations and an office manned during construction which has access to the emergency services listed below.

C. Where an office has more than 2 occupants, install an additional telephone on a separate line for each additional occupant or pair of occupants.

D. At each telephone location provide for access to emergency service, post a list of important telephone numbers, including:
1. Local Police.
2. Fire Department.
3. Doctor.
4. Ambulance service.
5. Contractor's temporary office and home office.
6. Architect's office.
7. Engineers' offices.
8. Owner's office.
9. Principal Contractors' field and home offices.

E. Provide an answering machine, voice-mail service or messaging service on superintendent's telephone.

3.9 SEWERS AND DRAINAGE:

A. Provide temporary connections to remove effluent that can be lawfully discharged into available existing sewers.

B. If sewers and drainage facilities cannot be lawfully used for discharge of effluent, provide containers to remove and dispose of effluent off the site in a lawful manner.

C. Connect temporary sewers as directed by governing authorities.

D. Maintain temporary sewers and drainage facilities in a clean, sanitary condition, ready for maximum use. Following heavy usage, restore normal conditions promptly.

E. Filter out soil, debris, chemicals, oils and other contaminants that might clog sewers or pollute waterways.

3.10 INSTALLATION OF TEMPORARY FACILITIES:

A. Provide a reasonably neat and uniform appearance in temporary construction and support facilities acceptable to the Architect and the Owner.

B. Locate field offices, storage and fabrication sheds and other support facilities for easy access. Position offices so that windows allow the best possible view of construction activities.

C. Make the change-over to use of permanent services and facilities at the earliest feasible date at each portion of the Work, in a manner to minimize interference with performance of the Work.

D. Maintain temporary facilities as necessary until Substantial Completion. Immediately prior to Substantial Completion remove these facilities.

E. Personnel remaining at the site beyond Substantial Completion will have use of certain

permanent facilities under restricted use conditions acceptable to the Owner.

3.11 TEMPORARY HEAT:

A. Provide temporary heat where indicated or as needed for performance of the Work, for curing or drying and for protection of work from adverse effects of low temperatures or high humidity.

B. Select heating equipment known to be safe and which will not have a harmful effect upon completed work or work being installed.

C. Coordinate heating and ventilation to produce required ambient conditions and to minimize the consumption of fuel.

D. Maintain temperature and humidity conditions as required for specific work. Where no minimum is specified, maintain a minimum temperature of 45oF in permanently enclosed portions of the building and 65oF in areas where finished work has been installed.

E. Except where use of the permanent heating system is authorized, provide vented self-contained LP gas or fuel oil heaters with individual space thermostatic control for temporary heat.

F. Do not use gasoline-burning space heaters, open flame, or salamander type heating units.

G. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment from that specified that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.

3.12 FIELD OFFICES:

A. Provide standard prefabricated or mobile units, insulated and weathertight, with operable windows and lockable entrances.

B. Provide temporary field offices of sufficient size to accommodate site office. Keep office clean and orderly.

C. Provide a vented space heater, capable of maintaining a uniform indoor temperature of 68oF, and an air-conditioning unit capable of maintaining a maximum indoor temperature of 72oF.

D. Provide switch controlled fluorescent light fixtures capable of maintaining average illumination of 20 foot-candles at desk height, and 110-120 volt duplex outlets spaced at 12' intervals, with a minimum of one per wall in each room.

E. Furnish suitably with not less than a desk and 2 chairs, a 4-drawer file cabinet, plan table and plan rack and a 6-shelf bookcase.

F. Equip the office with a drinking-water cooler and a private toilet complete with water closet, lavatory and mirror-medicine cabinet unit.

G. Provide, as a part of the field office, or as a separate facility, a room of not less than 200 square feet for Project meetings, furnished with a conference table, 8 folding chairs and a tackboard.

H. Provide the Project Representative's office with a desk, 2 chairs, 4-drawer file, plan table and rack, and shelving.

I. Maintain support facilities until near Substantial Completion. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.

3.13 STORAGE AND FABRICATION SHEDS:

A. Install sheds, properly sized, furnished and equipped, to accommodate applicable work, including temporary utility services.

B. Sheds may be open shelters or fully enclosed spaces, whether within the building construction area or elsewhere on the site.
   1. Construct framing, sheathing, and siding using fire-retardant-treated lumber and plywood.
   2. Paint exposed lumber and plywood with exterior-grade acrylic-latex emulsion over exterior primer.

C. Protect stored materials from excessive humidity and contact with the ground by providing vapor retardant membrane and palletized storage or vapor retardant floor construction.

3.14 TEMPORARY ROADS AND WALKS:

A. Construct and maintain temporary roads and walks to support the indicated loading adequately and to withstand exposure to traffic during the construction period. Prevent from rutting and washout. Locate temporary roads, storage areas, and parking where the same permanent facilities will be located as shown in the "Project Logistics" Section of the Special Conditions and as directed by the Construction Manager. Maintain temporary roads and walks so they are free and clear for passage. Provide snow and ice removal services to maintain the free and safe passage on temporary roads, staging areas, building entrances and walks.

3.15 SANITARY FACILITIES:

A. General:
   1. Sanitary facilities include temporary toilets, wash facilities and drinking water fixtures.
   2. Comply with governing regulations including safety and health codes for the type, number, location, operation and maintenance of fixtures and facilities; provide not less than specified requirements. Install in locations that will best serve the Project's needs.
   3. Locate toilets and drinking water fixtures so that no one within the construction area will need to walk more than two stories vertically or 200 feet horizontally to each facility.
   4. Supply and maintain toilet tissue, paper towels, paper cups and similar disposable materials as appropriate for each facility.
   5. Provide covered waste containers.

B. Toilets:
   1. Provide single-occupant self-contained units of the chemical, aerated recirculation, or combustion type, properly vented.
   2. Units to be fully enclosed with a shell of glass fiber reinforced polyester or similar non- absorbent material.
   3. Locate and shield units for privacy.

C. Wash Facilities:
   1. Install potable-water-supply wash facilities at locations convenient to construction personnel involved in the handling of compounds and materials where wash-up is necessary to maintain a healthy and sanitary condition.
   2. Drain and dispose of drainage properly. Supply soap and other cleaning compounds appropriate for each condition.
   3. Where recommended or required by governing authorities or recognized standards, provide shower baths, safety showers, eye-wash fountains and similar facilities for the convenience, safety and sanitation of construction personnel.

D. Drinking Water Fixtures:
   1. Provide drinking water fountains where and when piped potable water is reasonably accessible from permanent or temporary lines.
   2. Otherwise, provide containerized tap-dispenser bottled-water type drinking water units, include the appropriate paper cup supply.

3.1 DEWATERING FACILITIES AND DRAINS:

A. Maintain the site, excavations and construction free of water.

B. Dispose of rainwater in a lawful manner which will not result in flooding the Project or adjoining property, nor endanger either permanent work or temporary facilities.
   1. Remove snow and ice as required to minimize accumulations.

C. Provide temporary drainage where the roofing or similar waterproof deck construction is completed prior to the connection and operation of the permanent drainage system.

D. Comply with requirements in applicable Division 2 Sections for temporary drainage and dewatering facilities and operations not directly associated with construction activities included in individual Sections. Where feasible, use same facilities.

3.17 TEMPORARY ENCLOSURES:

A. At the earliest practical time provide temporary enclosure of materials, equipment, work in progress and completed portions of the Work for protection from exposure, weather, and construction site activities.
   1. Moisture (rain, snow, hail, etc.) or wind infiltration through temporary or permanent enclosures shall be cleaned up and reinstalled within 24 hours of occurrence, and damaged materials, equipment and furnishings replaced at Contractor's own cost.
   2. Work not completed within 24 hours of occurrence, shall be performed by the Owner's own forces and costs associated with repairs and clean-up shall be charged to the Contractor through a Change Order.

B. Provide insulated temporary enclosures where temporary heat is needed and the permanent building enclosure is not yet completed, and there is no other adequate provision for containment of temporary heat. Coordinate enclosures with ventilating and material drying or curing requirements to avoid dangerous conditions and effects.
   1. Vertical Openings: Close openings of 25 sq. ft. or less with plywood or similar materials.
   2. Horizontal Openings: Close openings in floor or roof decks and horizontal surfaces with load-bearing, wood-framed construction.
   3. Install tarpaulins securely using fire-retardant-treated wood framing and other materials.
   4. Where temporary wood or plywood enclosure exceeds 100 sq. ft. in area, use fire-retardant-treated material for framing and main sheathing.

C. Provide temporary partitions and ceilings where required 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 surfaces, fixtures, and equipment.

D. Construct enclosures with closed joints and sealed edges at intersections with existing surfaces. Use materials that have a maximum flame spread rating of 25, ASTM E-84. Paint the enclosure surfaces which are exposed to view in Owner occupied areas.
   1. Insulate partitions to provide noise protection to occupied areas.
   2. Seal joints and perimeter. Equip partitions with dustproof doors and security locks.
   3. Protect air-handling equipment.

3.18 PROJECT IDENTIFICATION AND TEMPORARY SIGNS:

A. General:
   1. Signs, other than those provided by the Construction Manager, are no permitted.

B. Project Identification and Temporary Signs: Prepare project identification and other signs indicated Install signs where indicated to inform public and persons seeking entrance to the Project. Support on posts or framing of preservative-treated wood or steel. Do not permit installation of unauthorized signs.
   1. Project identification Signs: Engage an experienced sign painter to apply graphics. Comply with details indicated.
   2. Temporary Signs: Prepare signs to provide directional information to construction personnel and visitors.

3.19 PROTECTION OF INSTALLED WORK:

A. Provide temporary protection for installed products. Control traffic in immediate area to minimize possible damage.

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

C. Protect finished floors and stairs from pedestrian traffic, movement of heavy objects, and material storage.

D. Prohibit traffic and storage on waterproofed and roofed surfaces, on lawn and on landscaped areas.

E. Protect trees and plantings against vehicular traffic, stored material, chemically injurious material, continuous running water and puddling, and dumping.

3.20 COLLECTION AND DISPOSAL OF WASTES:

A. Provide waste-collection containers in sizes adequate to handle waste from construction operations. Containerize and clearly label hazardous, dangerous, or unsanitary waste materials separately from other waste. Comply with Division 1 Section "Execution Requirements" for progress cleaning requirements.
   1. If required by authorities having jurisdiction, provide separate containers, clearly labeled, for each type of waste material to be deposited.
   2. Develop a waste management plan for Work performed on Project. Indicate types of waste materials Project will produce and estimate quantities of each type. Provide detailed information for on-site waste storage and separation of recyclable materials. Provide information on destination of each type of waste material and means to be used to dispose of all waste materials.

B. Collect and dispose of waste materials from construction areas and elsewhere on the site.

C. Enforce requirements strictly. Do not hold collected materials at the site longer than 7 days.

D. Handle waste materials that are hazardous, dangerous, or unsanitary, separately from other inert waste by appropriate containerizing.

E. Dispose of waste material in a lawful manner.

F. Do not bury or burn waste materials on the site.

G. Do not wash waste materials down sewers or into waterways.

H. Provide rodent proof containers conveniently located on each floor level to encourage depositing of garbage and similar wastes by construction personnel.

3.21 RODENT AND PEST CONTROL:

A. Early in the construction process before deep foundation work has been completed, retain a recognized local exterminator or insect-and-pest control company to recommend practices that will minimize attraction and harboring of rodents, roaches and other pests.

B. Employ control service to perform extermination and control procedures at regular intervals so that the project will be relatively free of pests and their residues at Substantial Completion. Obtain extended warranty for Owner.

C. Perform control operations in a lawful manner using environmentally safe materials.

3.22 CONSTRUCTION AIDS:

A. Design, construct, and maintain construction aids and miscellaneous general services and facilities as needed to accommodate performance of the Work.

B. These facilities include, but are not limited to:
1. Temporary stairs and ladders.
2. Guardrails and barriers.
3. Walkways.
4. Scaffolding.
5. Platforms.
6. Swing Stages.
7. Ramps & Bridges.
8. Incidental Sheeting & Shoring.
9. Demolition Waste Chutes.

C. Provide miscellaneous services and facilities to meet O.S.H.A. standards of safety and to comply with laws, rules and regulations having jurisdiction.

D. Cover surfaces of finished permanent facilities such as stairs and ramps with durable protection and use them in lieu of temporary facilities as soon as practicable.

3.23 SECURITY AND PROTECTION:

A. General:
1. Provide a reasonably neat and uniform appearance in security and protection facilities acceptable to the Architect and the Owner.

2. Except for using permanent fire protection as soon as available, does not change over from use of temporary security and protection facilities to use of permanent facilities until Substantial Completion.

B. Security Enclosure and Lockup: Install substantial temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security.

C. Temporary Fire Protection:
1. Until fire protection needs may be fulfilled by permanent facilities, install and maintain temporary fire protection facilities of the types needed to adequately protect against reasonably predictable and controllable fire losses.
2. Comply with the applicable recommendations of NFPA Standard 10 "Standard for Portable Fire Extinguishers" and NFPA 241 "Standard for Safeguarding Construction Alterations and Demolition Operations".
3. Locate fire extinguishers where they are most convenient and effective for their intended purposes, but provide not less than one extinguisher on each floor at or near each usable stairwell.
4. Store combustible materials in containers in recognized fire-safe locations.
5. Develop and supervise an overall fire prevention and first-aid fire protection program for personnel at the Project site. Review needs with the local fire department officials and establish procedures to be followed.
6. Instruct personnel in methods and procedures to be followed, post warnings and information and enforce strict discipline.
7. Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire protection facilities, stairways and other access routes for fighting fires.
8. Prohibit smoking within the construction site.
9. Provide supervision of welding operations, combustion type temporary heating units, and similar sources of ignition for possible fires.

D. Permanent Fire Protection:
1. At the earliest feasible date in each area of the Project, complete installation of the permanent fire protection facility, including connected services, and place into operation and use.
2. Instruct key personnel at the site on how to use facilities.

3.24 BARRICADES, WARNING SIGNS AND LIGHTS:

A. Comply with recognized standards and applicable code requirements for the erection of substantial, structurally adequate barricades where needed to prevent accidents and losses.

B. Paint with appropriate colors, graphics and warning signs to inform personnel and the public of the hazard being protected against.

C. Provide lighting where appropriate and needed, including flashing red lights where appropriate.
1. For safety barriers, sidewalk bridges, and similar uses, provide minimum 5/8-inch-thick exterior plywood.

D. Covered Walkway: Erect a structurally adequate, protective, covered walkway for passage of persons along adjacent public street. Coordinate with entrance gates, other facilities, and obstructions. Comply with regulations of authorities having jurisdiction.
1. Construct covered walkways using scaffold or shoring framing.
2. Provide wood-plank overhead decking, protective plywood enclosure walls, handrails, barricades, warning signs, lights, safe and well-drained walkways, and similar provisions for protection and safe passage.

3. Extend back wall beyond the structure to complete enclosure fence.
4. Paint and maintain in a manner approved by Owner and Architect.
5. For safety barriers, sidewalk bridges, and similar uses, provide minimum 5/8-inch-thick exterior plywood.

3.25 ENCLOSURE FENCE:

A. Before excavation begins, install an enclosure fence with lockable entrance gates. Locate where indicated, or enclose the entire site or the portion determined sufficient to accommodate construction operations. Install in a manner that will prevent people, dogs and other animals from easily entering the site.

1. Temporary Fences: All temporary fencing shall be new chain link security fencing that extends six feet (6') above existing grade and shall be installed with a top and bottom 4.5mm tension wire; fabric shall be tied to posts at a maximum of twelve inches (12") on center. Corner posts shall be reinforced using bracing. Fence posts shall be spaced at a maximum of ten feet (10') on center and set at a minimum of three feet (3') into undisturbed soil. Provide bracing as required.
2. Temporary Gates: Gate openings shall be a minimum of 30'-0" with (2) 15'- 0" gates. All gate posts shall be six inches (6") O.D. and set in three feet (3'-0") of concrete. Gates shall be galvanized steel tubing 1 3/8" O.D. round with adjustable truss rods; Gate fabric shall be two inch (2") less than the adjacent fence height. Each gate leaf shall be provided with hinges, a gate wheel (minimum 8" swivel wheel) and a drop rod to secure the gate when opened. Gate latches shall be fabricated with integral eye openings for pad locks. A length of heavy duty chain shall be provided for each pair of gates with sufficient length to secure the gate. A quantity of ten (10) padlocks, keyed alike, and quantity of (50) keys shall be provided to the Construction Manager.
3. Remove and/or relocate temporary fencing and gates when directed by the Construction Manager and provide all work to repair sitework damaged in the installation and/or removal of the temporary fencing and gates.
4. Reference Site Use Plans for location of Temporary Fencing and Gates.

B. Locate as directed to accommodate construction operations, to keep public from construction areas and to allow public access to areas used by Owner.

C. Relocate as directed as construction work progresses.

D. Install in a manner to obstruct entry to building site except by way of the entrance gates.

3.26 ENVIRONMENTAL PROTECTION:

A. Provide general protection facilities, operate temporary facilities, and conduct construction activities, in ways and by methods that comply with environmental regulations, and that minimize the possibility of contaminating the air, waterways and subsoil and that minimize other undesirable effects which might result from the performance of work at the site. All Work shall be performed in accordance with the Storm Water Pollution Prevention Plan (SWPPP), reference specification section 00 0850.

B. Avoid the use of tools and equipment which produce harmful noise.

C. Restrict the use of noise making tools and equipment to hours of use that will minimize noise complaints from persons or firms near the project site.

D. Stormwater Control: Provide earthen embankments and similar barriers in and around excavations and subgrade construction, sufficient to prevent flooding by runoff of storm water from heavy rains. Reference the Storm Water Pollution Prevention Plan (SWPPP) for additional storm water control requirements.

E. Tree and Plant Protection: Install temporary fencing located as indicated or outside the drip line of trees to protect vegetation from construction damage. Protect tree root systems from damage, flooding, and erosion.

3.27 OPERATION OF TEMPORARY FACILITIES:

A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.

B. Limit availability of facilities to essential and intended uses to minimize waste and abuse.

C. Operate and maintain temporary services and facilities in good operating condition throughout the time of use and until removal is authorized.

D. Protect from damage by freezing temperatures and harsh weather conditions.

E. Maintain such facilities as temporary enclosures, heating, cooling, humidity control, and ventilation on a 24-hour day basis where required in performance of the Work and to avoid damage to the Work or the facilities.

F. Prevent water-filled piping from freezing, by use of ground covers, with insulation, by temporary heating, or by draining.

G. Maintain distinct markers for underground lines. Protect from damage during excavation operations.

3.28 TERMINATION AND REMOVAL:

A. Unless the Architect requests that it be maintained for a longer period of time, remove each temporary service and facility promptly when the need for it has ended, or when it has been replaced by the authorized use of a permanent facility, and no later than Substantial Completion.

B. Complete, or if necessary restore, permanent work delayed or damaged because of interference with the temporary service or facility.

C. Repair damaged work, clean exposed surfaces and replace work which cannot be satisfactorily repaired.

D. Materials and facilities that constitute temporary services and facilities are and remain the property of the Contractor, excepting that the Owner reserves the right to take possession of the Project identification signs.

E. Remove temporary road construction which is not intended for or acceptable for integration into permanent paving.

F. Where the area shown is intended for landscape development, remove soil and aggregate fill that does not comply with requirements for fill or subsoil in the landscape area.

G. Remove materials contaminated with road oil, asphalt and other petro-chemical compounds, and other substances which might impair growth of plant materials or grass.

H. Repair or replace street paving, curbs and sidewalks at temporary entrances, as required by the governing authority.

I. At Substantial Completion, clean and renovate permanent facilities used during construction period. Comply with final cleaning requirements in Division 1 Section "Closeout Procedures."

END OF SECTION 01 5200

SECTION 01 6000 - PRODUCT REQUIREMENTS

PART 1 – GENERAL

1.1 RELATED DOCUMENT

A. Drawings and general provisions of the Contract, including Division 00 and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for selecting products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; product substitutions; and comparable products.

B. See Division 1 Section "Closeout Procedures" for submitting warranties for contract closeout.

1.3 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.

1. 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.
2. New Products: Items that have not previously been incorporated into another project or facility.
3. 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.

B. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Subcontractor.

C. Basis-of-Design Product Specification: Where a specific manufacturer's product is named and accompanied by the words "basis of design," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of other named manufacturers.

D. Manufacturer's Warranty: Preprinted written warranty published by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.

E. 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.

1.4 SUBMITTALS

A. Substitution Requests: Submit three copies of each request for consideration to the Construction Manager. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.

B. Substitutions may be proposed by the Subcontractor in accordance with the following:

1. The materials, products and equipment items described in the Contract Documents establish the standard of required quality, function, dimension and appearance expected. Unless the phrase "Or Approved Equal" or "Equivalent To" is stated, the bidder must base his Bid or Proposal on the use of one or more these specified items. If substitutions are to be proposed, the Bid or Proposal package must contain a list of proposed all substitutions. Each bidder shall list, at the time that Bids are received and in accordance with Specification Sections, all materials, products or equipment he proposes to offer as possible substitutions for specified items.
2. Additional substitution requests, during construction, will be considered only if the substitution is caused by specific material, product or equipment's subsequent removal from, or unavailability in the market place and only at "no charge" or "credit" to the Contract amount.
3. Substitution requests will be considered only if standards are met or exceeded as described above and are subsequently approved by the Architect and Owner.
4. The burden of proof of the merit of the proposed substitution is upon the proposer.
5. Documentation: Show compliance with requirements for substitutions and the following, as applicable:

    a. Statement indicating why specified material or product cannot be provided.
    b. Provide a detailed, line by line comparison, comparing significant qualities of the proposed substitution with those of the Work specified. Significant qualities may include elements such as performance, size, weight, durability, visual effect, specific features and requirements indicated.
    c. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate Subcontractors, that will be necessary to accommodate proposed substitution.
    d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
    e. Samples, where applicable or requested.
    f. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
    g. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
    h. Cost information, including a proposal of change, if any, in the Contract Sum.
    i. Subcontractor's certification that proposed substitution complies with requirements in the Contract Documents and is appropriate for applications indicated.
    j. Evidence that proposed product provides specified warranty.
    k. Statement indicated that acceptance of the proposed product will not adversely affect the project schedule.
    l. Subcontractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.

6. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation. Architect will notify the Construction Manager, in writing, of acceptance or rejection of proposed substitution.
7. The Architect's decision of approval or disapproval of a proposed substitution shall be final and will be set forth in writing.
8. Subcontractor's Responsibilities: If any of the following conditions occur due to the substitutions, the Subcontractor making the substitution shall bear the cost of such conditions,

including but not limited to payment for additional services and/or Work provided by the Owner, Construction Manager, Architect and/or other subcontractors.

a. Redesign required for any of the Work.
b. Material or quantity changes for any of the Work.
c. Delays in any of the Work.
d. Requests for information generated due to substitutions.

C. Basis-of-Design Product Specification Submittal: Comply with requirements in Division 1 Section "Submittal Procedures." Show compliance with requirements.

1.5 QUALITY ASSURANCE

A. Compatibility of Options: If Subcontractor 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.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft. Comply with manufacturer's written instructions.

1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
4. Inspect products on delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.
5. Store products to allow for inspection and measurement of quantity or counting of units.
6. Store materials in a manner that will not endanger Project structure.
7. Store products that are subject to damage by the elements, under cover in a weather tight enclosure above ground, with ventilation adequate to prevent condensation.
8. Construction Manager is responsible for designating and allotting on on-site storage space. Any relocation of stored materials necessitated by work progress will be accomplished promptly at no additional cost.
9. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
10. Protect stored products from damage.

PART 2 - PRODUCTS

2.1 PRODUCT OPTIONS

A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, that new at time of installation.

1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in

similar situations on other projects.

3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
4. Where products are accompanied by the term "as selected," Architect will make selection.
5. Where products are accompanied by the term "match sample," sample to be matched is Architect's.
6. Descriptive, performance, and reference standard requirements in the Specifications establish "salient characteristics" of products.

B. Product Selection Procedures: Procedures for product selection include the following:

1. Product: Where Specification paragraphs or subparagraphs titled "Product" name a single product and manufacturer, provide the product named.

   a. Substitutions may be considered.

2. Manufacturer/Source: Where Specification paragraphs or subparagraphs titled "Manufacturer" or "Source" name single manufacturers or sources, provide a product by the manufacturer or from the source named that complies with requirements.

   a. Substitutions may be considered.

3. Products: Where Specification paragraphs or subparagraphs titled "Products" introduce a list of names of both products and manufacturers, provide one of the products listed that complies with requirements.

4. Manufacturers: Where Specification paragraphs or subparagraphs titled "Manufacturers" introduce a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements.
5. Available Products: Where Specification paragraphs or subparagraphs titled "Available Products" introduce a list of names of both products and manufacturers, provide one of the products listed.
6. Available Manufacturers: Where Specification paragraphs or subparagraphs titled "Available Manufacturers" introduce a list of manufacturers' names, provide a product by one of the manufacturers listed.
7. Basis-of-Design Products: Where Specification paragraphs or subparagraphs titled "Basis-of-Design Product" are included and also introduce or refer to a list of manufacturers' names, provide either the specified product or a comparable product by one of the other named manufacturers.
8. Visual Matching Specification: Where Specifications require matching an established Sample, select a product (and manufacturer) that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches satisfactorily.

   a. If no product available within specified category matches satisfactorily and complies with other specified requirements, comply with provisions of the Contract Documents on "substitutions" for selection of a matching product.

9. Visual Selection Specification: Where Specifications include the phrase "as selected from manufacturer's colors, patterns, textures" or a similar phrase, select a product (and manufacturer) that complies with other specified requirements.

   a. Standard Range: Where Specifications include the phrase "standard range of colors, patterns, textures" or similar phrase, Architect will select color, pattern, or texture from manufacturer's product line that does not include premium items.

b. Full Range: Where Specifications include the phrase "full range of colors, patterns, textures" or similar phrase, Architect will select color, pattern, or texture from manufacturer's product line that includes both standard and premium items.

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 6000

SECTION 01 6200 - CUTTING AND PATCHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including Division 00 and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes required procedures for cutting and patching.

B. Related Sections include the following:

1. "Selective Demolition" for demolition of selected portions of the building for alterations.

2. Division 1 Section "Selective Demolition" for demolition of selected portions of the building for alterations.

3. Divisions 2 through 17 Sections for specific requirements and limitations applicable to cutting and patching individual part of the Work.

    a. Requirements in this Section apply to the work of Division 2 through 17 including mechanical and electrical installations. Refer to Divisions 15, 16 and 17 Sections for other requirements and limitations applicable to cutting and patching mechanical, electrical and building systems installations.

1.3 DEFINITIONS

A. Cutting: Removal of existing construction necessary to permit installation or performance of other Work.

B. Patching: Fitting and repair work required to restore surfaces to original conditions after installation of other Work.

1.4 SUBMITTALS

A. Cutting and Patching Procedures: Submit a list of cutting and patching procedures at least 10 days before the time cutting and patching will be performed, requesting approval to proceed. Include the following information:

1. Extent: Describe cutting and patching, show how they will be performed, and indicate why they cannot be avoided. The description should outline the types of materials that will be cut, the material(s) to be used for patching and the physical extent to which finishes will be applied to ensure that the patching materials blend with the existing materials.
2. Changes to Existing Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in the building's appearance and other significant visual elements.
3. Products: List products to be used and firms or entities that will perform the Work.
4. Dates: Indicate when cutting and patching will be performed.
5. Utilities: List utilities that cutting and patching procedures will disturb or affect. List utilities that will be relocated and those that will be temporarily out of service. Indicate how long service will be disrupted. The shutdown of existing utilities shall be approved by the Owner, Construction Manager and Architect and must be scheduled at least 72 hours in advance.
6. Structural Elements: Where cutting and patching involve adding reinforcement to structural elements, submit details and engineering calculations showing integration of reinforcement with original structure.
7. Architect's and Construction Manager's Approval: Obtain approval of cutting and patching procedures before cutting and patching. Approval does not waive right to later require removal and replacement of unsatisfactory work.

1.5 QUALITY ASSURANCE

A. Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio. Should cutting of structural work become necessary, such work shall be done only with prior approval of the Architect/Engineer.

B. Operational Elements: Do not cut and patch operating or fixed building elements and safety related equipment or systems, in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety.

C. Visual Requirements: Do not cut and patch construction in a manner that results in a reduction of visual qualities or visual evidence of cutting and patching. Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner. Cutting and patching work is subject to the approval of the Construction Manager and Architect.

D. Cutting and Patching Conference: Before proceeding, meet at Project site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

1.6 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during cutting and patching operations, by methods and with materials so as not to void existing warranties.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Comply with requirements specified in other Sections of these Specifications.

B. Existing Materials: Use materials identical to existing materials. For exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.

1. If identical materials are unavailable or cannot be used, use materials that, when installed, will match the visual and functional performance of existing materials.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.

1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.

3.2 PREPARATION

A. Temporary Support: Provide temporary support of Work to be cut.

B. Protection: Protect existing construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.

C. Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

D. Existing Services: Where existing services are required to be removed, relocated, or abandoned, bypass such services before cutting to minimize interruption of services to affected occupied areas.

E. Obtain approval from the Construction Manager and coordinate cutting and patching with Owner operations, prior to the start of cutting and patching work.

3.3 PERFORMANCE

A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.

1. Cut existing construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.

B. Cutting: Cut existing construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction.

1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
2. Existing Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
3. Excavating and Backfilling: Comply with requirements in applicable Division 2 Sections where required by cutting and patching operations.
4. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
5. Maintain the building in a water tight condition at all times during cutting procedures.
6. Proceed with patching after construction operations requiring cutting are complete.

C. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections of these Specifications.

1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.
2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove existing floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.

    a. Where patching occurs in a painted surface, apply primer and intermediate paint coats over the patch and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.

4. Ceilings: Patch, repair, or rehang existing ceilings as necessary to provide an even-plane surface of uniform appearance.
5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weather tight condition.

END OF SECTION 01 6200

SECTION 01 7100 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. Drawings and general provisions of the Contract, including Division 00 and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY:

A. This Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:

1. Substantial Completion procedure
2. Final Completion procedure
3. Warranties.
4. Final cleaning.

B. Related Sections include the following:

1. Division 1 Section "Applications for Payment" for requirements for Applications for Payment for Substantial and Final Completion.
2. Division 1 Section "Project Coordination" for progress cleaning of Project site.
3. Division 1 Section "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.
4. Division 1 Section "Operation and Maintenance Data" for operation and maintenance manual requirements.
5. Division 1 Section "Demonstration and Training" for requirements for instructing Owner's personnel.
6. Divisions 2 through 33 Sections for specific closeout and special cleaning requirements for the Work in those Sections.

1.3 SUBSTANTIAL COMPLETION:

A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete in request.

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.
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, 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.
9. Submit test/adjust/balance records.
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.
15. Deliver certificates of inspection confirming compliance with applicable codes and regulations for the following:

    a. Plumbing and drainage.
    b. Heating, ventilating and air conditioning.
    c. Fire protection.
    d. Electrical.

B. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Architect and Construction Manager 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. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
2. Results of completed inspection will form the basis of requirements for Final Completion.
3. Architect and Construction Manager will assign values to uncompleted and/or unaccepted work. The Contractor's application for payment will be adjusted for incomplete and/or unaccepted work.

1.4 FINAL COMPLETION:

A. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:

1. Submit a final Application for Payment according to Division 1 Section "Payment Procedures."
2. 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.
3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
4. Submit pest-control final inspection report and warranty.
5. Consent of surety to final payment.
6. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.

B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Architect and Construction Manager will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection

or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
2. The Architect will invoice the Owner for services performed in inspections beyond the original inspection and the first reinspection. The Owner will, in turn, pass this cost on to the Contractor and require a "deduct" Change Order due to the Owner.

1.5 LIST OF INCOMPLETE ITEMS (PUNCH LIST):

A. Preparation: Submit three copies of list. Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.

1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor.
2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
3. Include the following information at the top of each page:

    a. Project name.
    b. Date.
    c. Name of Architect and Construction Manager.
    d. Name of Contractor.
    e. Page number.

1.6 WARRANTIES:

A. Provide the standard one (1) year contractor's warranty on the warranty form provided by the Construction Manager. All equipment and extended warranties shall be provided by the specific manufacturers, and according to Contract Document requirements. **All warranties shall commence on the date of the Certificate of Substantial completion.**

B. Submittal Time: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.

C. Partial Occupancy: Submit properly executed warranties within 15 days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.

D. Organize warranty documents into an orderly sequence based on the table of contents of the Project Specifications.

1. Bind warranties and bonds in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch (215- by-280-mm) paper.
2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.

E. Provide additional copies of each warranty to include in operation and maintenance manuals and

an electronic file of all warranties and bonds into single indexed electronic PDF file with links enabling navigation to each item.

PART 2 - PRODUCTS

2.1 MATERIALS:

A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.1 FINAL CLEANING:

A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.

1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for the entire Project or for a portion of Project:

a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
d. Remove tools, construction equipment, machinery, and surplus material from the Project site.
e. Remove snow and ice to provide safe access to building.
f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
h. Sweep concrete floors broom clean in unoccupied spaces.
i. Vacuum carpet and similar soft surfaces, removing debris and excess nap; shampoo if visible soil or stains remain.
j. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.
k. Remove labels that are not permanent.

l. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.

1) Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.

m. Wipe surfaces of mechanical and electrical equipment, elevator equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
n. Replace parts subject to unusual operating conditions.
o. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
p. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
q. Clean ducts, blowers, and coils if units were operated without filters during construction.
r. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs, and those noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.
s. Leave Project clean and ready for occupancy.

C. Pest Control: Engage an experienced, licensed exterminator to make a final inspection and rid Project of rodents, birds, insects, and other pests. Prepare a report.

D. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

3.2 POST-CONSTRUCTION INSPECTION:

A. Prior to expiration of one (1) year from date of Substantial Completion, Architect and Construction Manager at request of Owner shall make a visual inspection of the Project in company with Owner and Contractor to determine whether correction of Work is required, in accordance with provisions of the Contract Documents.

B. For guarantees beyond one (1) year, Architect and Construction Manager will make inspections at the request of the Owner, after notification to Contractor.

C. Architect thru the Construction Manager will promptly notify the Contractor, in writing, of any observed deficiencies.

END OF SECTION 01 7100

SECTION 01 7200 - OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. Drawings and general provisions of the Contract, including Division 00 and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY:

A. This Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:

1. Operation and maintenance documentation directory.
2. Emergency manuals.
3. Operation manuals for systems, subsystems, and equipment.
4. Maintenance manuals for the care and maintenance of products, materials, finishes, systems and equipment.

B. Related Sections include the following:

1. Division 1 Section "Submittal Procedures" for submitting copies of submittals for operation and maintenance manuals.
2. Division 1 Section "Closeout Procedures" for submitting operation and maintenance manuals.
3. Division 1 Section "Project Record Documents" for preparing Record Drawings for operation and maintenance manuals.
4. Divisions 3 through 33 Sections for specific operation and maintenance manual requirements for products in those Sections.

1.3 DEFINITIONS:

A. System: An organized collection of parts, equipment, or subsystems united by regular interaction.

B. Subsystem: A portion of a system with characteristics similar to a system.

1.4 SUBMITTALS:

A. Initial Submittal: Submit 2 draft copies of each manual at least 15 days before requesting inspection for Substantial Completion. Include a complete operation and maintenance directory. Architect will return 1 copy of draft and mark whether general scope and content of manual are acceptable.

B. Final Submittal: Submit 1 copy of each manual in final form at least 15 days before final inspection. Architect will return copy with comments within 15 days after final inspection.

1. Correct or modify each manual to comply with Architect's comments. Submit 3 copies of each corrected manual within 15 days of receipt of Architect's comments.

1.5 COORDINATION:

A. Where operation and maintenance documentation includes information on installations by more than one factory-authorized service representative, assemble and coordinate information furnished by representatives and prepare manuals.

PART 2 - PRODUCTS

2.1 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY:

A. Organization: Include a section in the directory for each of the following:

1. List of documents.
2. List of systems.
3. List of equipment.
4. Table of contents.

B. List of Systems and Subsystems: List systems alphabetically. Include references to operation and maintenance manuals that contain information about each system.

C. List of Equipment: List equipment for each system, organized alphabetically by system. For pieces of equipment not part of system, list alphabetically in separate list.

D. Tables of Contents: Include a table of contents for each emergency, operation, and maintenance manual.

E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with the same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

2.2 MANUALS, GENERAL:

A. Organization: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:

1. Title page.
2. Table of contents.
3. Manual contents.

B. Title Page: Enclose title page in transparent plastic sleeve. Include the following information:

1. Subject matter included in manual.
2. Name and address of Project.
3. Name and address of Owner.
4. Date of submittal.
5. Name, address, and telephone number of Contractor.
6. Name and address of Architect.
7. Cross-reference to related systems in other operation and maintenance manuals.

C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.

1. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.

D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.

1. Binders: Heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch (115-by-280-mm) paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.

a. If two or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by subsystem and related components. Cross-reference other binders if necessary to provide essential information for proper operation or maintenance of equipment or system.
b. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter of contents. Indicate volume number for multiple-volume sets.

2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.
3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software diskettes for computerized electronic equipment.
4. Supplementary Text: Prepared on 8-1/2-by-11-inch (115-by-280-mm), 20-lb/sq. ft. (75-g/sq. m) white bond paper.
5. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.

a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

2.3 EMERGENCY MANUALS:

A. Content: Organize manual into a separate section for each of the following:

1. Type of emergency.
2. Emergency instructions.
3. Emergency procedures.

B. Type of Emergency: Where applicable for each type of emergency indicated below, include instructions and procedures for each system, subsystem, piece of equipment, and component:

1. Fire.
2. Flood.

3. Gas leak.
4. Water leak.
5. Power failure.
6. Water outage.
7. System, subsystem, or equipment failure.
8. Chemical release or spill.

C. Emergency Instructions: Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of Owner's operating personnel for notification of Installer, supplier, and manufacturer to maintain warranties.

D. Emergency Procedures: Include the following, as applicable:

1. Instructions on stopping.
2. Shutdown instructions for each type of emergency.
3. Operating instructions for conditions outside normal operating limits.
4. Required sequences for electric or electronic systems.
5. Special operating instructions and procedures.

2.4 OPERATION MANUALS:

A. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:

1. System, subsystem, and equipment descriptions.
2. Performance and design criteria if Contractor is delegated design responsibility.
3. Operating standards.
4. Operating procedures.
5. Operating logs.
6. Wiring diagrams.
7. Control diagrams.
8. Piped system diagrams.
9. Precautions against improper use.
10. License requirements including inspection and renewal dates.

B. Descriptions: Include the following:

1. Product name and model number.
2. Manufacturer's name.
3. Equipment identification with serial number of each component.
4. Equipment function.
5. Operating characteristics.
6. Limiting conditions.
7. Performance curves.
8. Engineering data and tests.
9. Complete nomenclature and number of replacement parts.

C. Operating Procedures: Include the following, as applicable:

1. Startup procedures.
2. Equipment or system break-in procedures.
3. Routine and normal operating instructions.
4. Regulation and control procedures.
5. Instructions on stopping.
6. Normal shutdown instructions.

7. Seasonal and weekend operating instructions.
8. Required sequences for electric or electronic systems.
9. Special operating instructions and procedures, including economy and efficiency adjustments.
10. Effective energy utilization.

D. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.

E. Piped Systems: Diagram piping as installed, and identify color-coding where required for identification.

2.5 PRODUCT MAINTENANCE MANUAL:

A. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.

B. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.

C. Product Information: Include the following, as applicable:

1. Product name and model number.
2. Manufacturer's name.
3. Color, pattern, and texture.
4. Material and chemical composition.
5. Reordering information for specially manufactured products.

D. Maintenance Procedures: Include manufacturer's written recommendations and the following:

1. Inspection procedures.
2. Types of cleaning agents to be used and methods of cleaning.
3. List of cleaning agents and methods of cleaning detrimental to product.
4. Schedule for routine cleaning and maintenance.
5. Repair instructions.

E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.

F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

1. Include procedures to follow and required notifications for warranty claims.

2.6 SYSTEMS AND EQUIPMENT MAINTENANCE MANUAL:

A. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.

B. Source Information: List each system, subsystem, and piece of equipment included in the

manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.

C. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:

1. Standard printed maintenance instructions and bulletins.
2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
3. Identification and nomenclature of parts and components.
4. List of items recommended to be stocked as spare parts.

D. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:

1. Test and inspection instructions.
2. Troubleshooting guide, including noise and vibration adjustments.
3. Precautions against improper maintenance.
4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
5. Aligning, adjusting, and checking instructions.
6. Demonstration and training videotape, if available.

E. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.

1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.

F. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.

G. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.

H. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

1. Include procedures to follow and required notifications for warranty claims.

PART 3 - EXECUTION

3.1 MANUAL PREPARATION:

A. Operation and Maintenance Documentation Directory: Prepare a separate manual that provides an organized reference to emergency, operation, and maintenance manuals.

B. Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by Owner's operating personnel for types of emergencies indicated.

C. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.

D. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.

1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.

E. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.

1. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.

F. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in Record Drawings to ensure correct illustration of completed installation.

1. Do not use original Project Record Documents as part of operation and maintenance manuals.
2. Comply with requirements of newly prepared Record Drawings in Division 1 Section "Project Record Documents."

G. Reference Specification Section 017300 for Electronic submission requirements for operation and maintenance data.

H. Comply with Division 1 Section "Closeout Procedures" for the schedule for submitting operation and maintenance documentation.

END OF SECTION 01 7200

SECTION 01 7300 - EXECUTION REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The Drawings and general provisions of the Contract, including Division 00 and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section specifies the required procedures governing execution of the Work including, but not limited to, the following:

1. Construction layout.
2. Field engineering and surveying.
3. General installation of products.
4. Progress cleaning.
5. Starting and adjusting.
6. Protection of installed construction.
7. Correction of the Work.

B. See Division 1 Section "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.

1.3 SUBMITTALS

A. Certificates: Submit a certificate signed by the land surveyor or professional engineer certifying the location and elevation of improvements.

B. Final Property Survey: Submit six (6) hard copies and one (1) PDF electronic data file of the final property survey.

C. Project Record Documents: Submit a record of Work performed and record survey data as required under provisions of "Submittals" and "Contract Closeout" Sections.

1.3 QUALITY ASSURANCE

A. Surveyor Qualifications: Engage a land surveyor, registered in the state in which the work is being performed, for all required land-surveying services.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Existing Conditions: The existence and location of site improvements, utilities, and other construction indicated as existing are not guaranteed. Before beginning work, investigate and verify the existence and location of mechanical and electrical systems and other construction affecting the Work. Before construction, verify the location and points of connection of utility services.

B. Existing Utilities: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities and other construction affecting the Work.

C. Acceptance of Conditions: Examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.

1. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
2. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
3. Provide written acceptance of grades, structures, subgrades and systems, either existing or installed by other Subcontractors adjacent to or upon which the Subcontractor will be installing their work.
4. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Existing Utility Information: Furnish information to local utility that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.

B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

3.3 CONSTRUCTION LAYOUT

A. Identification: The Owner/Construction Manager/Engineer shall establish two (2) fixed benchmarks.. Subcontractors shall preserve the permanent reference points throughout construction.

B. Establish and maintain a minimum of two (2) permanent benchmarks on the site, referenced to data established by survey control points.

1. Record benchmark locations, with horizontal and vertical data, on project record documents.

C. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify the Construction Manager and Architect promptly.

D. Do not change or relocate benchmarks or control points without prior written approval. Promptly report lost or destroyed reference points or requirements to relocate reference points because of necessary changes in grades or locations.

E. Promptly replace lost or destroyed Project control points. Base replacements on the original survey control points.

F. Work from lines and levels established by the property survey. Establish benchmarks and markers to set lines and levels at each story of construction and elsewhere as needed to locate each element of the Project. Calculate and measure required dimensions within indicated or recognized tolerances. Do not scale Drawings to determine dimensions.

1. Advise entities engaged in construction activities of marked lines and levels provided for their use.
2. As construction proceeds, check every major element for line, level and plumb.
3. Record deviations from required lines and levels, and advise the Construction Manager when deviations that exceed indicated or recognized tolerances are detected. On Project Record Drawings, record deviations that are accepted and not corrected.
4. On completion of foundation walls, major site improvements, and other work requiring field engineering services, prepare a certified survey showing dimensions, locations, angles, and elevations of construction and sitework.

G. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and invert elevations.

H. Final Property Survey: Engage a land surveyor to prepare a final property survey showing significant features (real property) for Project. Include on the survey a certification, signed by land surveyor, that principal metes, bounds, lines and levels of Project are accurately positioned as shown on the survey.

1. Show boundary lines, monuments, streets, site improvements and utilities, existing improvements and significant vegetation, adjoining properties, acreage, grade contours, and the distance and bearing from a site corner to a legal point.
2. Recording: At substantial Completion, have the final property survey recorded by or with authorities having jurisdiction as the official "property survey."

I. Each Subcontractor shall expedite the laying out of their Work when the location of Work by other trades is dependent upon such layout. Whenever the Work of one Subcontractor is delayed due to the failure of another to layout their Work or to effect timely completion of any portion of their Work, the Subcontractor being delayed shall notify the Construction Manager, who shall notify the Subcontractor to take prompt and effective action to complete the Work which is causing the delay. If the Subcontractor fails to take prompt and effective action to complete the Work, causing the delay, the Construction Manager shall have the right to authorize another Subcontractor to complete the work and charge the Subcontractor causing the delay for these costs. The Construction Manager shall be the sole judge as to the responsibility for the delay.

3.4 INSTALLATION

A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.

1. Make vertical work plumb and make horizontal work level.
2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
3. Conceal pipes, ducts, and wiring in finished areas, unless otherwise indicated.

B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.

C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.

D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading

in excess of that expected during normal conditions of occupancy.

E. Anchors and Fasteners: Provide anchors and fasteners as required to anchor each component securely in place, accurately located and aligned with other portions of the Work.

1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
2. Allow for building movement, including thermal expansion and contraction.

F. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.

G. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.5 PROGRESS CLEANING

A. General: Clean Project site and work areas daily, including common areas. Coordinate progress cleaning for joint-use areas where more than one installer has worked. Enforce requirements strictly. Dispose of materials lawfully.

1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
2. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.

B. Site: Maintain Project site free of waste materials and debris.

C. Work Areas:

1. Maintain work areas and construction areas within the contract limit lines free of trash, debris and packaging materials and broom clean, on a daily basis. Utilize sweeping compound at all times while maintaining work areas and construction areas in a broom clean condition. Remove liquid spills promptly. Any Subcontractor failing to maintain the work site in a safe, clean condition on a daily basis will be assessed the cost of clean up performed by the Owner or other Subcontractors under the direction of the Construction Manager.
2. Any Subcontractor performing work in an occupied section of a facility, during unoccupied hours, should perform whatever cleanup is necessary to leave the work area in as clean condition as it was found when work started. This cleanup shall include vacuuming, dusting, sweeping, mopping and any other cleanup procedures that are required.
3. No construction debris shall be transported through occupied sections of a facility during occupied hours.

D. Public Roads: Roads shall be cleared of all mud, dust, store, debris, etc. on a daily basis or as directed by the Construction Manager.

E. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.

F. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.

G. Waste Disposal: Burying or burning waste materials on-site is prohibited. Washing waste materials down sewers or into waterways is prohibited.

H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration prior to Substantial Completion.

I. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.6 STARTING AND ADJUSTING

A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.

B. Adjust operating components for proper operation without binding. Adjust equipment for proper operation.

C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

3.7 PROTECTION OF INSTALLED CONSTRUCTION

A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

B. Comply with material manufacturer's written instructions for temperature and relative humidity requirements.

C. Subcontractors are responsible for the protection of their own finish work and are responsible to prevent damage to the work of other Subcontractors while working on site and performing their own work.

D. All finish surfaces shall be protected from damage; finish surfaces that become damaged shall be repaired to the satisfaction of the Construction Manager and Architect.

E. Prior to any material being stored on finish floor surfaces, the Subcontractor shall obtain approval from the Construction Manager. Subcontractors shall install a protective barrier over these finish surfaces when materials are stored over new materials.

F. Roof surfaces shall not be subjected to construction traffic, nor shall they be used for the storage of materials. Where activity must take place in order to carry out the work of the Contract, the Subcontractor shall provide the Construction Manager with a protection plan, including but not limited to the following:

a. The type of work to be performed.

b. The area where the work will be performed.

c. Traffic patterns to be used for access/egress to/from the work area.

d. Material and methods to be used as protection.

The plan shall be submitted to the Construction Manager no less than two (2) weeks prior to performing the work to allow time for review of the plan.

Costs for protection of roof surfaces shall be included in the Base Bid for the project.

Under no condition shall any work take place on roof surfaces without the Construction Manager's prior authorization. Damage to the aforementioned surface shall be repaired at the expense of the Subcontractor who is deemed responsible for such damage, in the sole judgment of the Construction Manager.

3.8 CORRECTION OF THE WORK

A. Repair or remove and replace defective construction. Restore damaged substrates and finishes. Comply with requirements in Division 1 Section "Cutting and Patching."

1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.

B. Restore permanent facilities used during construction to their specified condition.

C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.

D. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.

E. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION 01 7300

SECTION 01 7839 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including Division 00 and Division 01 Specification Sections, apply to this Section

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for Project Record Documents, including the following:

1. Record Drawings.
2. Record Specifications.
3. Record Product Data.
4. Operation and Maintenance Manuals
5. Tools, keys, spare parts and extra material

1.3 SUBMITTALS

A. Record Drawings: Comply with the following:

1. Number of Copies: Submit copies of Record Drawings as follows:

a. Submittal: Submit one set of plots from corrected Record AutoCAD Drawings and one set of marked-up Record Prints. Architect will initial and date each plot and mark whether general scope of changes, additional information recorded, and quality of drafting are acceptable. Architect will return plots and prints for final corrections and organizing into sets, printing, binding, and final submittal to Owner for review, acceptance and ownership.

b. The Architect, and its consultants, will provide electronic files for the Contractor's use in the preparation of shop, coordination, and record drawings related to the project. Note: Contractors requiring electronic files of the fire protection, plumbing, HVAC or electrical will need to purchase them directly from M/E. Reference Digital Data Release Agreement attached to Specification Section 01 3100. Files are subject the following terms and conditions:

B. Record Specifications: Submit one copy of Project's Specifications, including addenda and contract modifications.

C. Record Product Data: Submit one copy of each Product Data submittal.

1. Where Record Product Data is required as part of operation and maintenance manuals, submit marked-up Product Data as an insert in manual instead of submittal as Record Product Data.

D. Certification: With each application for payment, provide written certification that Project Record Documents are current at time application is submitted.

E. Operation and Maintenance Manuals; Electronic Files: Submit manuals in the form of a multiple file composite electronic PDF file for each manual type required.

1. Electronic Files: Use electronic files prepared by manufacturer where available. Where scanning or paper documents is required, configure scanned file for minimum readable file size.

2. File Names and Bookmarks: Enable bookmarking of individual documents based on file names. Name document files to correspond to system, subsystem and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem and equipment names in a readily navigated file tree. Configure electronic manual to display bookmark panel on opening file.

PART 2 - PRODUCTS

2.1 RECORD DRAWINGS

A. Record Prints: Maintain one set of blue- or black-line white prints of the Contract Drawings and Shop Drawings.

1. Preparation: Mark Record Prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, sub-Contractor, or similar entity, to prepare the marked-up Record Prints.

a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
b. Accurately record information in an understandable drawing technique.
c. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.

2. Content: Types of items requiring marking include, but are not limited to, the following:

a. Dimensional changes to Drawings.
b. Revisions to details shown on Drawings.
c. Depths of foundations below first floor.
d. Locations and depths of underground utilities referenced to permanent surface improvements.
e. Revisions to routing of piping and conduits.
f. Revisions to electrical circuitry.
g. Actual equipment locations.
h. Duct size and routing.
i. Locations of concealed internal utilities referenced to visible and accessible features of the structure.
j. Changes made by addendum.
k. Changes made by Change Order or Construction Change Directive.

l. Changes made following Architect's written orders.
m. Changes made following Construction Manager's written orders.
n. Details not on the original Contract Drawings.
o. Field records for variable and concealed conditions.
p. Record information on the Work that is shown only schematically.

3. Mark the Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely and accurately. If Shop Drawings are marked, show cross-reference on the Contract Drawings.
4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
5. Mark important additional information that was either shown schematically or omitted from original Drawings.
6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.

B. Record AutoCAD Drawings: Immediately before inspection for Certificate of Substantial Completion, review marked-up Record Prints with Architect and Construction Manager. When authorized, prepare a full set of corrected AutoCAD Drawings of the Contract Drawings, as follows:

1. Format: Same AutoCAD program, version, and operating system as the original Contract Drawings.
2. Incorporate changes and additional information previously marked on Record Prints. Delete, redraw, and add details and notations where applicable.
3. Refer instances of uncertainty to Architect through Construction Manager for resolution.
4. Architect will furnish Contractor one set of AutoCAD Drawings of the Contract Drawings for use in recording information in accordance with this Section.

C. Format: Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.

1. Record Prints: Organize Record Prints into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
2. Record AutoCAD Drawings: Organize AutoCAD information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each AutoCAD file.
3. Identification: As follows:

a. Project name.
b. Date.
c. Designation "PROJECT RECORD DRAWINGS."
d. Name of Architect and Construction Manager.
e. Name of Contractor.

2.2 RECORD SPECIFICATIONS

A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.

2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
4. For each principal product, indicate whether Record Product Data has been submitted in operation and maintenance manuals instead of submitted as Record Product Data.
5. Note related Change Orders, Record Product Data, and Record Drawings where applicable.

2.3 RECORD PRODUCT DATA

A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
3. Note related Change Orders, Record Specifications, and Record Drawings where applicable.

2.4 MISCELLANEOUS RECORD SUBMITTALS

A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

2.5 OPERATION AND MAINTENANCE MANUAL

A. The Operation and Maintenance Manuals shall be divided into five (5) sections as follows:

1. Operation and maintenance documentation directory. This directory shall include a list of the documents, a list of the systems, a list of the equipment in each system, and a table of contents.
2. Emergency Manuals: Include a separate, concise section for reference in the event of an emergency. This section shall be subdivided into three (3) sections, as follows:

    a. Type of emergency.
    b. Emergency instructions.
    c. Emergency procedures.

3. Operation Manuals:

    a. Content: In addition to requirements in this section, include operation data required and individual specification sections and the following information.
        1) System and equipment descriptions.
        2) Operating standards and procedures.
        3) Operating logs.
        4) Wiring and control diagrams.

5) Piped system diagrams.
6) Precautions against improper use.
7) License requirements, including inspection and renewal dates.

b. Operation Manuals shall include a detailed and comprehensive description of each system and system component, including all pertinent manufacturers' data and equipment characteristics.

c. Operating procedures should be provided to describe equipment startup and break-in procedures, routine and normal operating instructions, shut-down instructions, seasonal operating characteristics, and sequence of operations data.

4. Product Maintenance Manual

a. Organize the manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds.

5. Systems and Equipment Maintenance Manual

a. For each system, subsystem and piece of equipment not part of a system include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contract and warranty and bond information as described in these specifications.

B. Operating and Maintenance Manuals: O&M Manuals are to be provided in accordance with the following items:

1. All O&M Manuals and information shall be submitted in Binders. Binders shall be eight and one-half inch by eleven inch (8 1/2" x 11") three "D" side ring binders with durable plastic covers, three inch (3") maximum ring size with a clear plastic sleeve on the spine to hold label describing contents, and with pockets inside to hold folded oversized sheets.

2. The first page of the Manual shall be the Table of Contents for each Volume of the O&M Manuals, followed by the general contract one-year warranty.

3. Each Binder shall have a typed written cover identifying the Binder as Operation and Maintenance Instructions, with the title of the project, date, and description of the contents.

4. Provide index tab dividers for each section of the Binder. Label each tab with the specification name on the front and the specification number on the back. Each section is to begin with a section summary page, which indicates the contents contained, noting applicable product manufacturers, service / repair contact names, phone numbers, product specific warranties, and other pertinent information.

5. All O&M data contained in the Binders shall be printed on 20 lb. minimum paper.

6. Drawings contained in the O&M Manuals shall be triple folded and bound with reinforced hole punches.

7. Provide company, name, address, and telephone number for the responsible Contractor for each item listed in the Table of Contents.

8. All warranties shall be contained within the O&M Manuals in the appropriate Specification Section.

9. All product bonds shall be contained within the O&M Manuals in the appropriate Specification Section.

10. Submit O&M Manuals in the following manner:

    a. Each Contractor shall submit one (1) copy of the O&M Manual for review by the Architect. The Architect will then return a reviewed copy of the O&M Manual to the Contractor, with review comments. After addressing the review comments and final approval is made, the Contractor shall submit three (3) hard copies and one (1) electronic file of the O&M Manual to the Construction Manager. The electronic file of all O&M Manuals shall be provided as a single indexed electronic PDF file with links enabling navigation to each item.

    b. O&M Manuals are to be submitted to the Construction Manager 20 days prior to r to substantial completion. This is required such that Owner can circulate these manuals to ensure that the appropriate personnel have sufficient opportunity to review the manuals prior to training.
        1) If supplements to the original manual need to be submitted, the Contractor shall provide a tab in the manual. As the supplemental information becomes available, the Contractor shall forward three (3) copies (all on 3-hole punched paper) with a submittal cover sheet to the Construction Manager

2.6 TOOLS, KEYS, SPARE PARTS AND EXTRA MATERIALS

All turnover material is to be forwarded to the Owner. Coordinate with the Construction Manager prior to delivery. Tools, spare parts and extra materials to be turned over are to be listed, in detail, on a transmittal and signed by an authorized representative of the Owner. Provide a copy of the transmittal to the Construction Manager.

PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

A. Recording: Maintain one copy of each submittal during the construction period for Project Record Document purposes. Post changes and modifications to Project Record Documents as they occur; do not wait until the end of Project.

B. Maintenance of Record Documents and Samples: Store Record Documents and Samples in the field office apart from the Contract Documents used for construction. Do not use Project Record Documents for construction purposes. Maintain Record Documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to Project Record Documents for Architect's and Construction Manager's reference during normal working hours.

END OF SECTION 01 7839

SECTION 01 7900 - DEMONSTRATION AND TRAINING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including Division 00 and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for instructing Owner's personnel, including the following:

1. Demonstration of operation of systems, subsystems, and equipment.
2. Training in operation and maintenance of systems, subsystems, and equipment.
3. Demonstration and training videotapes.

1.3 SUBMITTALS

A. Instruction Program: Submit two copies of outline of instructional program for demonstration and training, including a schedule of proposed dates, times, length of instruction time, and instructors' names for each training module. Include learning objective and outline for each training module.

1. At completion of training, submit one complete training manual(s) for Owner's use.

B. Attendance Record: For each training module, submit list of participants and length of instruction time.

C. Evaluations: For each participant and for each training module, submit results and documentation of performance-based test.

D. Demonstration and Training Video: Submit two copies within seven (7) days of end of each training module.

1. Identification: On each copy, provide an applied label with the following information:

a. Name of Project.
b. Name and address of photographer.
c. Name of Architect and Construction Manager.
d. Name of Contractor.
e. Date videotape was recorded.
f. Description of vantage point, indicating location, direction (by compass point), and elevation or story of construction.

2. Transcript: Prepared on 8-1/2-by-11-inch (215-by-280-mm) paper, punched and bound in heavy-duty, 3-ring, vinyl-covered binders. Mark appropriate identification on front and spine of each binder. Include a cover sheet with same label information as the corresponding video. Include name of Project and date of the video on each page.

1.4 QUALITY ASSURANCE

A. Facilitator Qualifications: A firm or individual experienced in training or educating maintenance personnel in a training program similar in content and extent to that indicated for this Project, and whose work has resulted in training or education with a record of successful learning performance.

B. Instructor Qualifications: A factory-authorized service representative, complying with requirements in Division 01 Section "Quality Requirements," experienced in operation and maintenance procedures and training.

C. Photographer Qualifications: A professional photographer who is experienced photographing construction projects.

D. Preconstruction Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination." Review methods and procedures related to demonstration and training including, but not limited to, the following:

1. Inspect and discuss locations and other facilities required for instruction.
2. Review and finalize instruction schedule and verify availability of educational materials, instructors' personnel, audiovisual equipment, and facilities needed to avoid delays.
3. Review required content of instruction.
4. For instruction that must occur outside, review weather and forecasted weather conditions and procedures to follow if conditions are unfavorable.

1.5 COORDINATION

A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations.

B. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.

C. Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data has been reviewed and approved by Architect.

PART 2 - PRODUCTS

2.1 INSTRUCTION PROGRAM

A. Program Structure: Develop an instruction program that includes individual training modules for operation, adjustment and maintenance of each system and equipment required by individual Specification Sections.

B. Training Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participant is expected to master. Use the operating and maintenance manuals required by the Contract Documents as the basis for instruction, including a full detailed review of them manual's contents including explanation of all aspects of operation and maintenance.

1. Prepare and include additional data when the need for additional data becomes apparent during the training sessions.

C. O & M Manuals: Owner demonstrations shall include a review of O & M Manuals, value tag charts, project record documents and any other project closeout documentation necessary to ensure that the Owner is familiar with the installed system.

PART 3 - EXECUTION

3.1 PREPARATION

A. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a combined training manual.

B. Set up instructional equipment at instruction location.

C. Operational and Maintenance Manuals must be submitted twenty (20) days prior to the demonstration and training.

3.2 INSTRUCTION

A. Facilitator: Engage a qualified facilitator to prepare instruction program and training modules, to coordinate instructors, and to coordinate between Contractor and Owner for number of participants, instruction times, and location.

B. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.

1. Owner will furnish an instructor to describe Owner's operational philosophy.
2. Owner will furnish Contractor with names and positions of participants.

C. Scheduling: Provide instruction at mutually agreed on times after all final inspections, tests, and repairs have been completed. For equipment that requires seasonal operation, provide similar instruction at start of each season.

1. Schedule training with Owner, through Construction Manager, with at least seven days' advance notice.
2. Schedule training during Contractor's normal week and daily hours. The Owner shall have the responsibility of scheduling Owner's shift work personnel accordingly.

D. Evaluation: At conclusion of each training module, assess and document each participant's mastery of module by use of a demonstration performance-based test.

E. Cleanup: Collect used and leftover educational materials and give to Owner. Remove instructional equipment. Restore systems and equipment to condition existing before initial training use.

3.3 DEMONSTRATION AND TRAINING VIDEOS

A. General: Engage a qualified commercial videographer to record demonstration and training video recordings. Record each training module separately. Include classroom instructions and demonstrations, board diagrams, and other visual aids, but not student practice.

1. At beginning of each training module, record each chart containing learning objective and lesson outline.

B. Video: Provide minimum 640 x 480 video resolution converted to format file type acceptable to Owner, on electronic media.

1. Electronic Media: Read-only format compact disc acceptable to Owner, with commercial-grade graphic label.
2. File Hierarchy: Organize folder structure and file locations according to project manual table of contents. Provide complete screen-based menu.
3. File Names: Utilize file names based upon name of equipment generally described in video segment, as identified in Project specifications.
4. Contractor and Installer Contact File: Using appropriate software, create a file for inclusion on the Equipment Demonstration and Training Video that describes the following for each Contractor involved on the Project, arranged according to Project table of contents:

    a. Name of Contractor/Installer.
    b. Business address.
    c. Business phone number.
    d. Point of contact
    e. Email address.

C. Recording: Mount camera on tripod before starting recording, unless otherwise necessary to adequately cover area of demonstration and training. Display continuous running time.

1. Film training session(s) in segments not to exceed 15 minutes.
    a. Produce segments to present a single significant piece of equipment per segment.
    b. Organize segments with multiple pieces of equipment to follow order of Project Manual table of contents.
    c. Where a training session on a particular piece of equipment exceeds 15 minutes, stop filming and pause training session. Begin training session again upon commencement of new filming segment.

D. Light Levels: Verify light levels are adequate to properly light equipment. Verify equipment markings are clearly visible prior to recordings.

1. Furnish additional portable lighting as required.

E. Narration: Describe scenes on video recording by audio narration by microphone while video recording is recorded. Include description of items being viewed.

F. Transcript: Provide a transcript of the narration. Display images and running time captured from videotaped opposite of the corresponding narration segment.

G. Pre-produced Video Recordings: Provide video recordings used as a component of training modules in same format as recordings of live training.

END OF SECTION 01 7900