City of North Lauderdale

Fire Stations 44
Roof Wind Mitigation Project

SPECIFICATIONS MANUAL

7700 Hampton Blvd.
North Lauderdale, FL 33068

BID SET
March 24, 2020
City of North Lauderdale
Fire Stations 44
Roof Wind Mitigation Project

TABLE OF CONTENTS

00004- Bid Tab 2
00005- Drawing Index 1

DIVISION 1 - GENERAL REQUIREMENTS
01015 - Summary 4
01020 - Allowances 1
01025 - Measurement and Payment 5
01035 - Payment Procedures 4
01310 - Project Management and Coordination 7
01320 - Construction Progress Documentation 8
01322 - Photographic Documentation 4
01330 - Submittal Procedures 10
01400 - Quality Requirements 6
01410 - Regulatory Requirements 3
01420 - References 3
01430 - Quality Assurance 5
01500 - Temporary Facilities and Controls 6
01524 - Construction Waste Management 5
01560 - Temporary Barriers and Enclosures 10
01561 - Construction Cleaning 2
01600 - Product Requirements 6
01700 - Execution Requirements 5
01760 - Protection of Installed Construction 2
01770 - Closeout Procedures 5
01780 - Closeout Submittals 9
01781 - Project Record Documents 5
01782 - Operation and Maintenance Data 7
01783 - Roof Maintenance Data 4

DIVISION 2 – SITE CONSTRUCTION
02070 - Selective Demolition 7

DIVISION 6 – WOOD AND PLASTIC PRODUCTS
06100 - Rough Carpentry 6

DIVISION 7 - THERMAL AND MOISTURE PROTECTION
07200 - Insulation 4
07410 - Standing Seam Metal Roof Panels 6
07550- Modified Bituminous Roofing 14
07600 - Flashing and Sheet Metal 2
07710 - Roof Penetrating Flashing 2
07900 - Joint Sealers 6
## Base Bid Items

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Description</th>
<th>Quantity</th>
<th>Unit List</th>
<th>Payment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mobilization - (Not to exceed 3% of total bid price)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Insurance, payment bond, performance bond – (Not to exceed 3% of total bid price)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>General Conditions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Indemnification</td>
<td>Lump sum</td>
<td>$ 10.00</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Permit Allowance</td>
<td>Lump sum</td>
<td>$ 10,000.00</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Demolition</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Owner Directed Modifications, Unforeseen Conditions</td>
<td>Lump sum</td>
<td>$ 15,000.00</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Standing Seam Metal Roof and Torch applied Roofing System at both Main Building and Generator Building. Include Rooftop equipment and Prefabricated Curbs</td>
<td>7,000</td>
<td>SF</td>
<td></td>
</tr>
</tbody>
</table>

**TOTAL BASE BID**

$ _____________ Lump Sum

__________________________________

Name of Bidder
SECTION 00005 – DRAWING INDEX

CITY OF NORTH LAUDERDALE
FIRE STATION 44
ROOF WIND MITIGATION PROJECT

DRAWING INDEX

FIRE STATION 44

A0.00  Cover Sheet – Drawing Index

ARCHITECTURAL

A2.00  Exterior Elevations Demolition Drawings
A2.01  Exterior Elevations
A3.01  Building Section and Wall Section
A3.02  Metal Deck Details
A5.01  Roof Plan, Roof Details
A5.02  Roof Details
A5.03  Roof Details
A10.01 Generator Room Plans, Elevations, Details

END OF SECTION 00005
SECTION 01015 - SUMMARY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Special Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Work covered by the Contract Documents.
2. Type of the Contract.
3. Work restrictions.
4. Existing Conditions.
5. Permits and Fees.
6. Job Site Visitation.
7. Pre-Construction Meeting.
8. Regulatory Requirements.
10. Specification formats and conventions.

B. Related Sections include the following:

1. Division 1 Section 01500 "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.

1.3 WORK COVERED BY CONTRACT DOCUMENTS

A. Project Identification: Fire Station 44 Roof Wind Mitigation Project

1. Project Location: 7700 Hampton Boulevard, North Lauderdale, Florida 33068

B. Owner: City of North Lauderdale, Florida

1. Owner's Representative: Kanya Olivier, Public Works Project Manager

C. Architect: Walters Zackria Associates

D. Brief description of work at Fire Station 44 Main Building is as follows (See drawings for more details):

a. Remove existing standing seam metal roof and install new Standing Seam Metal Roof at sloped areas.

b. Remove existing membrane and lightweight insulating concrete and install new Torch Applied System and Tapered Insulation at flat roof over the Apparatus Bay area.

c. Remove and replace rooftop equipment curb as specified in the Construction Documents.

E. Brief description of work at Fire Station 44 Generator Building is as follows (See drawings for more details):

a. Remove existing standing seam metal roof and install new Standing Seam Metal Roof at sloped areas.
1.4 TYPE OF CONTRACT

A. Project will be done under a single prime contract between the City of North Lauderdale, Florida, and a Florida Certified Roofing Contractor.

B. Roofing Contractor will be required to perform all Demolition and Construction Work stipulated in the Construction Documents. In addition, Contractor shall repair any damaged adjacent elements, buildings, utilities, etc. as a result of Demolition or Construction Work. Contractor shall coordinate work with occupants of existing building and the City of North Lauderdale’s Project Manager.

1.5 WORK RESTRICTIONS

A. On-Site Work Hours: Work shall be performed at the Fire Stations during normal business working hours from 7:30 a.m. to 5 p.m., Monday through Friday, except otherwise indicated. No work is allowed after normal business hours or on weekends without prior permission from the owner. In addition, work shall not be allowed to start before:
   1. Roofing Contractor obtains a Building Permit from the Building Division having jurisdiction at this location.
   2. Roofing Contractor coordinates with Building Division for all required inspections.
   3. Roofing Contractor protects users of the building and adjacent areas.
   4. Coordinate work phasing so existing fire station operations are not disturbed.

B. The Fire Station will be operational during all phases of construction. Contractor shall phase the work in such a way that at least one bay is completely functional at all times.

1.6 EXISTING CONDITIONS

A. The existing Fire Station Building, parking lots and adjacent areas are existing to remain. The Fire Station is currently occupied and shall remain occupied during the duration of this Project. The Contractor is required to perform the work in a way that does not disturb the function or interrupt ongoing operations of the Fire Station. All work must be coordinated with the Station’s administration and scheduled with approval from the City of North Lauderdale Project Manager. The areas, equipment, or structures not covered by the work must be protected. Any areas, equipment, or structures damaged or disturbed in any way, must be repaired and brought to the condition they were found just prior to the commencement of work. All repairs must be done by the Contractor as part of this contract and to the complete satisfaction of the City.

B. The CONTRACTOR shall protect all existing utilities, building elements, and improvements not designated for removal and shall restore any damaged utilities, building elements and improvements to a condition equal to or better than they were prior to such damage or temporary relocation, all in accordance with requirements of the Contract Documents. If the CONTRACTOR does not repair the damaged elements in a timely manner, then the CITY may hire a contractor to complete the repairs and deduct the cost from the Contract amount.

1.7 PERMITS AND FEES

A. Contractor shall obtain all permits.

B. Any permit fees will be paid by the Contractor. Contractor will pay all permit fees using the permit allowance. This includes City of North Lauderdale and all other agencies. Contractor is responsible for all failed inspection fees.

C. Contractor is required to maintain all permits in an active status. Any permit that expires shall be reactivated by the contractor at no additional cost to the owner.
1.8 JOB SITE VISITATION

A. Contractor must visit the site prior to submitting the bid. In addition, Contractor is required to attend a mandatory Pre-Bid conference which the City of North Lauderdale shall advertise.

B. Submission of a Bid will be construed that the Bidder is acquainted sufficiently with the work to be performed.

1.9 PRE-CONSTRUCTION MEETING

A. After issuance of the Notice to Proceed and prior to the start of Work, the City will schedule and administer a conference to be attended by the Contractor, Architect, and the City's Project Manager to discuss coordination, schedules, and related matters.

1.10 REGULATORY REQUIREMENTS

A. The following codes are to be considered an integral part of the Project Manual:

3. ASCE 7-10

B. All work for this project shall conform to the above codes and to the requirements of any regulatory authority having jurisdiction.

1.11 CONFLICTING REQUIREMENTS

A. In the event of a conflict between the drawings, referenced standards, technical specifications, and codes the more rigid requirements shall apply provided they are not in conflict with the Florida Building Code.

B. Refer to Section 01400 QUALITY REQUIREMENTS, sub-section 1.4 for more information regarding Conflicting Requirements.

1.12 SPECIFICATION FORMATS AND CONVENTIONS

A. Specification Format: The Specifications are organized into Divisions and Sections using the 16-division format and CSI/CSC's "MasterFormat" numbering system.

1. Section Identification: The Specifications use Section numbers and titles to help cross-referencing in the Contract Documents. Sections in the Project Manual are in numeric sequence; however, the sequence is incomplete because all available Section numbers are not used. Consult the table of contents at the beginning of the Project Manual to determine numbers and names of Sections in the Contract Documents.
2. Division 1: Sections in Division 1 govern the execution of the Work of all Sections in the Specifications.

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

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

2. Imperative mood and streamlined language are generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by Contractor. Occasionally, the indicative or subjunctive mood may be used in the Section Text for clarity to describe responsibilities that must be fulfilled indirectly by Contractor or by others when so noted.

a. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01015
SECTION 01020 - ALLOWANCES

PART 1 - GENERAL

1.1 PERMIT ALLOWANCE (Bid Item No. 6)
   A. Included in the TOTAL BASE BID AMOUNT is the sum of Ten Thousand Dollars (10,000.00) for obtaining building permits, inspections and certificates of completion required by the State of Florida, any State Agencies, or by other local governmental entities including the City of North Lauderdale.
   B. Permit fees payable under this allowance shall be limited to the actual cost of the permits only.
   C. Fees excluded from this allowance include but are not limited to re-inspection fees, expired permit fees, and contractor’s overhead and profit. These costs should be included elsewhere in the Bid.
   D. A negative change order will be issued for any unused allowance balance at the completion of the project.

1.2 OWNER’S CONTINGENCY ALLOWANCE (Bid Item No. 7)
   A. 10% of Contractor’s total bid amount shall be included in the TOTAL BASE BID for unforeseen conditions, owner directed modifications, and approved increases to Contractor’s scope of work.
   B. Payment under this allowance shall be made to the Contractor for only approved change orders.
   C. Payment under this allowance shall be limited to the actual cost plus 15% mark-up applied to the total amount of labor, materials, and equipment.
   D. A negative change order will be issued for any unused allowance balance at the completion of the project.

END OF SECTION 01020
SECTION 01025 - MEASUREMENT AND PAYMENT

PART 1 - GENERAL

SCOPE:

Payment for the various items in the Bid Tabulation sheet for the North Lauderdale Fire Station 44 Wind Mitigation Project, as further specified herein, shall include all compensation to be received by CONTRACTOR for furnishing all tools, equipment, supplies, and manufactured articles, and for all labor, operations, and incidentals appurtenant to the items of work being described, as necessary to complete the various items of the WORK, all in accordance with requirements of the Contract Documents, including all appurtenances thereto, and including all costs of compliance with regulations of public agencies having jurisdiction, including Safety and Health Requirements of the Occupational Safety and Health Administration of the U.S. Department of Labor. No separate payment will be made for any item that is not specifically set forth in the Bid Tabulation sheet, and all costs therefore shall be included in prices named in the Bid Tabulation sheet for various appurtenant items of work.

1.1 MOBILIZATION (Bid Item No. 1)

Measurement for payment will include all expenses not specifically listed below but required by the contract documents and specifications, such as, temporary fencing, temporary utilities, tree protection, erosion and pollution controls, temporary utility setup, storage containers, signage, etc. Payment will be based upon the lump sum price for the MOBILIZATION paid as a percentage completed, upon verification by the Architect.

1.2 INSURANCE PAYMENT BOND, PERFORMANCE BOND (Bid Item No. 2)

Measurement for payment will include all expenses related to Insurance Payment Bond, Performance Bond, etc. required by the contract documents and specifications. Payment will be based upon the lump sum price for the Insurance Payment Bond, Performance bond

1.3 GENERAL CONDITIONS (Bid Item No. 3)

Measurement for payment will include all expenses not specifically listed below but required by the construction documents and specifications, such as supervision, project management, temporary utilities, and permits, etc. Payment will be based upon the lump sum price for the GENERAL CONDITIONS paid as a percentage of the project completed, upon verification by the Architect.

1.4 INDEMNIFICATION (Bid Item No. 4)

Bidder must state the amount of consideration required by the Bidder in return for the Bidder's promise of Indemnity contained in the GENERAL CONDITIONS. The amount stated shall be no less than $10.00. Payment will be based upon the lump sum price.
1.5 PERMIT ALLOWANCE (Bid Item No. 5)

A. Included in the TOTAL BASE BID AMOUNT is the sum of ten-thousand dollars ($10,000.00) for obtaining building permits, inspections and certificates of completion required by the State of Florida, State Agencies, or by other local governmental entities. See specification section 01020.

B. Fees excluded from this allowance include but are not limited to re-inspection fees, expired permit fees, and contractor's overhead and profit. These costs should be included elsewhere in the Bid.

C. Payment under the allowance item shall be made only for actual cost of the permits in accordance with the General Conditions of the Contract. Payment against the lump sum for each permit shall be included under the appropriate item in the approved Application for Payment.

1.6 DEMOLITION (Bid Item No. 6)

Measurement for payment will include all expenses not specifically listed below but required by the construction documents and specifications, such as demolition of all existing roofing elements. Payment will be based upon the lump sum price for the DEMOLITION paid as a percentage completed, upon verification by the Architect.

1.7 OWNER’S CONTINGENCY (Bid Item No. 7)

Measurement for payment from the Contingency will include items not specifically listed in the Construction Documents due to damaged wood found during construction and other Unforeseen Conditions. Payment for the work will be made as percentage completed, upon verification by the Architect.

1.8 ROOF REPLACEMENT WORK (Bid Item No. 8)

Measurement for payment will include all expenses not specifically listed below but required by the construction documents and specifications, for the replacement of all roofs, including all rooftop equipment, at the Main Building and Generator Building. Payment will be based upon the lump sum price for the replacement of all roofs and rooftop equipment at the Main Building and Generator Building paid as a percentage completed, upon verification by the Architect.

END OF SECTION 01025
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section specifies administrative and procedural requirements necessary to prepare and process Applications for Payment.

B. Related Sections include the following:

1. Division 1 Section "Construction Progress Documentation" for administrative requirements governing preparation and submittal of Contractor's Construction Schedule and Submittals Schedule.

1.3 DEFINITIONS

A. Schedule of Values: A statement furnished by Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

1.4 SCHEDULE OF VALUES

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

1. Correlate line items in the Schedule of Values with other required administrative forms and schedules, including the following:

a. Application for Payment forms with Continuation Sheets.
b. Submittals Schedule.
c. Contractor's Construction Schedule.

2. Submit the Schedule of Values to Architect at earliest possible date but no less than 10 days before the date scheduled for submittal of initial Applications for Payment.

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. Identification: Include the following Project identification on the Schedule of Values:
a. Project name and location.
b. Name of Architect.
c. Architect's project number.
d. Contractor's name and address.
e. Date of submittal.


3. Arrange the Schedule of Values in tabular form with separate columns to indicate the following for each item listed:

a. Related Specification Section or Division.
b. Description of the Work.
c. Name of subcontractor.
d. Name of manufacturer or fabricator.
e. Name of supplier.
f. Change Orders (numbers) that affect value.
g. Dollar value.

1) Percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.

4. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the Project Manual table of contents. Provide several line items for principal subcontract amounts, where appropriate.

5. Round amounts to nearest whole dollar; total shall equal the Contract Sum.

6. 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.

a. Differentiate between items stored on-site and items stored off-site. Include evidence of insurance or bonded warehousing.

7. Provide separate line items in the Schedule of Values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.

8. 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 shall be distributed as general overhead expense as Contractor's General Conditions. Payment will be made based on actual percentage of project completed on a monthly basis.

1.5 APPLICATIONS FOR PAYMENT

A. Each Application for Payment shall be consistent with previous applications and payments as certified by Architect, Owner's Field Inspector and Owner's Project Manager 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: The date for each progress payment is indicated in the Agreement between Owner and Contractor. The period of construction Work covered by each Application for Payment is the period indicated in the Agreement.

C. Payment Application Forms: Use City’s Standard Payment cover sheet with AIA Document G702 and AIA Document G703 Continuation Sheets as form for Applications for Payment.

D. Payment Application Forms: Use forms provided by Owner for Applications for Payment. Sample copies are included at end of this Section.

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

   1. Entries shall match data on the Schedule of Values and Contractor's Construction Schedule. Use updated schedules if revisions were made.
   2. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.

F. Transmittal: Submit 4 signed and notarized original copies of each Application for Payment to Architect by a method ensuring receipt within 24 hours. One copy shall include waivers of lien and similar attachments if required.

   1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.

G. Grant Item Payment Forms: With each Application for Payment, submit partial schedule of payment for each grant item required by the owner, if required. Applications for Payment will not be processed with completely updated grant forms.

H. Minority Participation Payment Forms: With each Application for Payment, submit partial schedule of minority sub-contractor and minority supplier Utilization Report, if required. Applications for Payment will not be processed with completely updated SBE / MBE forms.

I. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's liens from subcontractors, sub-subcontractors, and suppliers for construction period covered by the previous application.

   1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
   2. When an application shows completion of an item, submit final or full waivers.
   3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
   4. Submit final Application for Payment with final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.
   5. Waiver Forms: Submit waivers of lien on forms, executed in a manner acceptable to Owner.
J. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:

1. List of subcontractors.
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.
9. Certificates of insurance and insurance policies.

K. Application for Payment at Substantial Completion: After issuing 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. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.

L. 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."
6. AIA Document G707, "Consent of Surety to Final Payment."
7. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION
SECTION 01310 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 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. Coordination Drawings.
2. Administrative and supervisory personnel.
3. Project meetings.
4. Requests for Interpretation (RFIs).

B. Related Sections include the following:

1. Division 1 Section "Construction Progress Documentation" for preparing and submitting Contractor's Construction Schedule.
2. Division 1 Section "Execution Requirements" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
3. Division 1 Section "Closeout Procedures" for coordinating closeout of the Contract.

1.3 DEFINITIONS

A. RFI: Request from Contractor seeking interpretation or clarification of the Contract Documents.

1.4 COORDINATION

A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections that 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. Coordinate installation of different components with other contractors or subcontractors to ensure maximum accessibility for required maintenance, service, and repair.
3. Make adequate provisions to accommodate items scheduled for later installation.
4. Where availability of space is limited, coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair of all components, including mechanical and electrical.

B. Prepare memoranda for distribution 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.

C. 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.
8. Startup and adjustment of systems.
9. Project closeout activities.

D. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials.

1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. Refer to other Sections for disposition of salvaged materials that are designated as Owner's property.

1.5 SUBMITTALS

A. Coordination Drawings: Prepare Coordination Drawings if limited space availability necessitates maximum utilization of space for efficient installation of different components or if coordination is required for installation of products and materials fabricated by separate entities.

1. Content: Project-specific information, drawn accurately to scale. Do not base Coordination Drawings on reproductions of the Contract Documents or standard printed data. Include the following information, as applicable:

   a. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
   b. Indicate required installation sequences.
   c. Indicate dimensions shown on the Contract Drawings and make specific note of dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternate sketches to Architect for resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.

2. Sheet Size: At least 8-1/2 by 11 inches but no larger than 24 by 36 inches.
3. Number of Copies: Submit six opaque copies of each submittal. Architect will retain three copies; remainder will be returned. Mark up and retain one returned copy as a Project Record Drawing.
4. Refer to individual Sections for Coordination Drawing requirements for Work in those Sections.

B. Key Personnel Names: Within 10 days of issuance of contract, submit a list of key personnel assignments, including superintendent, project manager, and other personnel responsible for the project. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home and office telephone numbers. Provide resumes, list of project completed with similar scope in the last three years, and references with contact information for each individual.
1. **Owner and Architect will review all supervisory personnel qualifications.** Any individual not acceptable shall be replaced someone satisfactory to the Owner and Architect.
   a. The Architect or Owner may require replacement of supervisory individuals for poor performance and management, quality control problems, project delays, lack of oversight, etc. The contractor shall comply with such request within 5 working days.
   b. Contractor shall provide independently certified background checks, if required, to comply with state and local regulations. Any individual who does not pass the mandated requirements shall be removed immediately and replace with someone with a clean background.

2. Post copies of list in Project meeting room, in temporary field office, and by each temporary telephone. Keep list current at all times.

3. Provide names, addresses, and telephone numbers of individuals assigned as standbys in the absence of individuals assigned to Project.

1.6 **ADMINISTRATIVE AND SUPERVISORY PERSONNEL**

A. **General:** In addition to Project Superintendent, provide a dedicated Project Manager specific to this project as a supervisor to oversee proper performance of the Work. Project Manager shall attend all meetings and have the authority to make decisions on behalf of the General Contractor. Project Manager shall attend the site at a minimum once a day to evaluate the construction and to prepare a daily job report. Project Manager shall be responsible for all coordination, document handling, submittals review and processing, quality control, and project scheduling. The Project Manager, once approved, shall not be replaced without prior consent of the Owner and Architect.

1.7 **PROJECT MEETINGS**

A. General: 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, within three days of the meeting.

B. **Preconstruction Conference:** Schedule a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than 5 days after execution of the Agreement. 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, Architect, and their consultants; Contractor and its superintendent; project manager; major subcontractors; 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. Critical work sequencing and long-lead items.
   c. Designation of key personnel and their duties.
   d. Procedures for processing field decisions and Change Orders.
   e. Procedures for RFIs.
   f. Procedures for testing and inspecting.
g. Procedures for processing Applications for Payment.
h. Distribution of the Contract Documents.
i. Submittal procedures.
j. Preparation of Record Documents.
k. Responsibility for temporary facilities and controls.
l. Construction waste management and recycling.
m. Office, work, and storage areas.
n. Equipment deliveries and priorities.
o. First aid.
q. Progress cleaning.
r. Working hours.

3. Minutes: Record and distribute meeting minutes.

C. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity that requires coordination with other construction.

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 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:

   b. Related RFIs.
   c. Related Change Orders.
   d. Submittals.
   e. Review of mockups.
   f. Possible conflicts.
   g. Time schedules.
   h. Weather limitations.
   i. Manufacturer's written recommendations.
   j. Warranty requirements.
   k. Acceptability of substrates.
   l. Temporary facilities and controls.
   m. Regulations of authorities having jurisdiction.
   n. Testing and inspecting requirements.
   o. Installation procedures.
   p. Coordination with other work.
   q. Required performance results.
   r. Protection of adjacent work.
   s. Protection of construction and personnel.

3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.

4. Reporting: Distribute minutes of the meeting to each party present and to parties who should have been present.

5. 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: Conduct progress meetings at biweekly intervals. Coordinate dates of meetings with preparation of payment requests.
1. Attendees: In addition to representatives of Owner and Architect, each contractor, subcontractor, 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.

      1) Review schedule for next period.

   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) Hazards and risks.
     10) Progress cleaning.
     11) Quality and work standards.
     12) Status of correction of deficient items.
     13) Field observations.
     14) RFIs.
     15) Pending changes.
     16) Status of Change Orders.
     17) Documentation of information for payment requests.

3. Minutes: Record the meeting minutes.

4. Reporting: Distribute minutes of the meeting to each party present and to parties who should have been present.

   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.

1.8 REQUESTS FOR INTERPRETATION (RFIs)

A. Procedure: Immediately on discovery of the need for interpretation of the Contract Documents, and if not possible to request interpretation at Project meeting, prepare and submit an RFI in the form specified.

   1. RFIs shall originate with Contractor. RFIs submitted by entities other than Contractor will be returned with no response.
   2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.
B. Content of the RFI: Include a detailed, legible description of item needing interpretation and the following:

1. Project name.
2. Date.
3. Name of Contractor.
5. RFI number, numbered sequentially.
6. Specification Section number and title and related paragraphs, as appropriate.
7. Drawing number and detail references, as appropriate.
8. Field dimensions and conditions, as appropriate.
9. Contractor's suggested solution(s). If Contractor's solution(s) impact the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
10. Contractor's signature.
11. Attachments: Include drawings, descriptions, measurements, photos, Product Data, Shop Drawings, and other information necessary to fully describe items needing interpretation.
   a. Supplementary drawings prepared by Contractor shall include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments.

C. Hard-Copy RFIs: CSI Form 13.2A.

1. Identify each page of attachments with the RFI number and sequential page number.

D. Software-Generated RFIs: Software-generated form with substantially the same content as indicated above.

1. RFIs shall be electronic files in Microsoft Word Document Format.
2. Attachments shall be electronic files in Adobe Acrobat PDF format.

E. Architect's Action: Architect will review each RFI, determine action required, and return it. Allow seven working days for Architect's response for each RFI. RFIs received after 1:00 p.m. will be considered as received the following working day.

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 RFIs with numerous errors.

2. Architect's action may include a request for additional information, in which case Architect's time for response will start again.

3. 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 1 Section "Contract Modification Procedures."
   a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect in writing within 10 days of receipt of the RFI response.

F. On receipt of Architect's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect within seven days if Contractor disagrees with response.
G. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log bi-weekly. Use CSI Log Form 13.2B. Include the following:

1. Project name.
2. Name and address of Contractor.
3. Name and address of Architect.
4. RFI number including RFIs that were dropped and not submitted.
5. RFI description.
6. Date the RFI was submitted.
7. Date Architect's response was received.
8. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01310
SECTION 01320 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:

1. Preliminary Construction Schedule.
2. Contractor's Construction Schedule.
4. Daily construction reports.
5. Material location reports.
6. Field condition reports.
7. Special reports.

B. Related Sections include the following:

1. Division 1 Section "Project Management and Coordination" for submitting and distributing meeting and conference minutes.
2. Division 1 Section "Submittal Procedures" for submitting schedules and reports.
3. Division 1 Section "Photographic Documentation" for submitting construction photographs.
4. Division 1 Section "Quality Requirements" for submitting a schedule of tests and inspections.

1.3 DEFINITIONS

A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.

1. Critical activities are activities on the critical path. They must start and finish on the planned early start and finish times.
2. Predecessor Activity: An activity that precedes another activity in the network.
3. Successor Activity: An activity that follows another activity in the network.

B. Cost Loading: The allocation of the Schedule of Values for the completion of an activity as scheduled. The sum of costs for all activities must equal the total Contract Sum, unless otherwise approved by Architect.

C. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of Project.
D. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.

E. Event: The starting or ending point of an activity.

F. Float: The measure of leeway in starting and completing an activity.
   1. Float time is not for the exclusive use or benefit of either Owner or Contractor, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Contract completion date.
   2. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the successor activity.
   3. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.

G. Fragnet: A partial or fragmentary network that breaks down activities into smaller activities for greater detail.

H. Major Area: A story of construction, a separate building, or a similar significant construction element.

I. Milestone: A key or critical point in time for reference or measurement.

J. Network Diagram: A graphic diagram of a network schedule, showing activities and activity relationships.

K. Resource Loading: The allocation of manpower and equipment necessary for the completion of an activity as scheduled.

1.4 SUBMITTALS

A. Qualification Data: For scheduling consultant.

B. Submittals Schedule: Submit three copies of schedule. Arrange the following information in a tabular format:
   1. Scheduled date for first submittal.
   2. Specification Section number and title.
   3. Submittal category (action or informational).
   4. Name of subcontractor.
   5. Description of the Work covered.
   6. Scheduled date for Architect's final release or approval.

C. Preliminary Construction Schedule: Submit three opaque copies.
   1. Approval of cost-loaded preliminary construction schedule will not constitute approval of Schedule of Values for cost-loaded activities.

D. Contractor's Construction Schedule: Submit three opaque copies of initial schedule, large enough to show entire schedule for entire construction period.
   1. Submit an electronic copy of schedule, using software indicated, on CD-R, and labeled to comply with requirements for submittals. Include type of schedule (Initial or Updated) and date on label.
E. CPM Reports: Concurrent with CPM schedule, submit three copies of each of the following computer-generated reports. Format for each activity in reports shall contain activity number, activity description, cost and resource loading, original duration, remaining duration, early start date, early finish date, late start date, late finish date, and total float in calendar days.

1. Activity Report: List of all activities sorted by activity number and then early start date, or actual start date if known.
2. Logic Report: List of preceding and succeeding activities for all activities, sorted in ascending order by activity number and then early start date, or actual start date if known.
3. Total Float Report: List of all activities sorted in ascending order of total float.

F. Daily Construction Reports: Submit three copies at monthly intervals.

G. Material Location Reports: Submit three copies at monthly intervals.

H. Field Condition Reports: Submit three copies at time of discovery of differing conditions.

I. Special Reports: Submit three copies at time of unusual event.

1.5 QUALITY ASSURANCE

A. Scheduling Consultant Qualifications: An experienced specialist in CPM scheduling and reporting, with capability of producing CPM reports and diagrams within 24 hours of Architect's request.

1.6 COORDINATION

A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors.

B. Coordinate Contractor's Construction Schedule with the Schedule of Values, list of subcontracts, Submittals Schedule, progress reports, payment requests, and other required schedules and reports.

1. Secure time commitments for performing critical elements of the Work from parties involved.
2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

PART 2 - PRODUCTS

2.1 SUBMITTALS SCHEDULE

A. Preparation: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, resubmittal, ordering, manufacturing, fabrication, and delivery when establishing dates.

1. Coordinate Submittals Schedule with list of subcontracts, the Schedule of Values, and Contractor's Construction Schedule.
2. Initial Submittal: Submit concurrently with preliminary bar-chart schedule. Include submittals required during the first 60 days of construction. List those required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
3. Final Submittal: Submit concurrently with the first complete submittal of Contractor's Construction Schedule.
2.2 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

A. Procedures: Comply with procedures contained in AGC's "Construction Planning & Scheduling."

B. Time Frame: Extend schedule from date established for the Notice to Proceed to date of Final Completion.
   1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.

C. Activities: Treat each story or separate area as a separate numbered activity for each principal element of the Work. Comply with the following:
   1. Activity Duration: Define activities so no activity is longer than 15 days, unless specifically allowed by Architect.
   2. Procurement Activities: Include procurement process activities for the following long lead items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
   3. Submittal Review Time: Include review and resubmittal times indicated in Division 1 Section "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's Construction Schedule with Submittals Schedule.
   4. Startup and Testing Time: Include not less than 10 days for startup and testing.
   5. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Architect's administrative procedures necessary for certification of Substantial Completion.
   6. All site work and as-built surveys must be completed 30 working days prior to scheduled substantial completion date for Engineering certifications and regulatory approvals.
   7. Final Completion shall be allotted 15 days after substantial completion and shall be included in the total time under the contract.

D. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.
   1. Products Ordered in Advance: Include a separate activity for each product. Include delivery date indicated in Division 1 Section "Summary." Delivery dates indicated stipulate the earliest possible delivery date.
   2. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and Final Completion.

E. Cost Correlation: At the head of schedule, provide a cost correlation line, indicating planned and actual costs. On the line, show dollar volume of the Work performed as of dates used for preparation of payment requests.
   1. Refer to Division 1 Section "Payment Procedures" for cost reporting and payment procedures.
   2. Contractor shall assign cost to construction activities on the CPM schedule. Costs shall not be assigned to submittal activities unless specified otherwise but may, with Architect's approval, be assigned to fabrication and delivery activities. Costs shall be under required principal subcontracts for testing and commissioning activities, operation and maintenance manuals, punch list activities, Project Record Documents, and demonstration and training (if applicable), in the amount of 5 percent of the Contract Sum.
   3. Each activity cost shall reflect an accurate value subject to approval by Architect.
   4. Total cost assigned to activities shall equal the total Contract Sum.
F. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis using fragnets to demonstrate the effect of the proposed change on the overall project schedule.

2.3 PRELIMINARY CONSTRUCTION SCHEDULE

A. Bar-Chart Schedule: Submit preliminary horizontal bar-chart-type construction schedule within five days of date established for the Notice to Award.

B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line. Outline significant construction activities for first 60 days of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.

2.4 CONTRACTOR'S CONSTRUCTION SCHEDULE (CPM SCHEDULE)

A. General: Prepare network diagrams using AON (activity-on-node) format.


   1. Develop network diagram in sufficient time to submit CPM schedule so it can be accepted for use no later than 10 days after date established for the Notice to Proceed.

      a. Failure to include any work item required for performance of this Contract shall not excuse Contractor from completing all work within applicable completion dates, regardless of Architect's approval of the schedule.

   2. Conduct educational workshops to train and inform key Project personnel, including subcontractors' personnel, in proper methods of providing data and using CPM schedule information.

   3. Establish procedures for monitoring and updating CPM schedule and for reporting progress. Coordinate procedures with progress meeting and payment request dates.

   4. Use "one workday" as the unit of time. Include list of nonworking days and holidays incorporated into the schedule.

C. CPM Schedule Preparation: Prepare a list of all activities required to complete the Work. Using the preliminary network diagram, prepare a skeleton network to identify probable critical paths.

   1. Activities: Indicate the estimated time duration, sequence requirements, and relationship of each activity in relation to other activities. Include estimated time frames for the following activities:

      a. Preparation and processing of submittals.
      b. Mobilization and demobilization.
      c. Purchase of materials.
      d. Delivery.
      e. Fabrication.
      f. Utility interruptions.
      g. Installation.

   2. Critical Path Activities: Identify critical path activities, including those for interim completion dates. Scheduled start and completion dates shall be consistent with Contract milestone dates.
3. Processing: Process data to produce output data on a computer-drawn, time-scaled network. Revise data, reorganize activity sequences, and reproduce as often as necessary to produce the CPM schedule within the limitations of the Contract Time.

4. Format: Mark the critical path. Locate the critical path near center of network; locate paths with most float near the edges.
   a. Subnetworks on separate sheets are permissible for activities clearly off the critical path.

D. Initial Issue of Schedule: Prepare initial network diagram from a list of straight "early start-total float" sort. Identify critical activities. Prepare tabulated reports showing the following:

   1. Contractor or subcontractor and the Work or activity.
   2. Description of activity.
   3. Principal events of activity.
   4. Immediate preceding and succeeding activities.
   5. Early and late start dates.
   6. Early and late finish dates.
   7. Activity duration in workdays.
   8. Total float or slack time.
   10. Dollar value of activity (coordinated with the Schedule of Values).

E. Schedule Updating: Concurrent with making revisions to schedule, prepare tabulated reports showing the following:

   1. Identification of activities that have changed.
   2. Changes in early and late start dates.
   3. Changes in early and late finish dates.
   5. Changes in the critical path.
   6. Changes in total float or slack time.

F. Value Summaries: Prepare two cumulative value lists, sorted by finish dates.

   1. In first list, tabulate activity number, early finish date, dollar value, and cumulative dollar value.
   2. In second list, tabulate activity number, late finish date, dollar value, and cumulative dollar value.
   3. In subsequent issues of both lists, substitute actual finish dates for activities completed as of list date.
   4. Prepare list for ease of comparison with payment requests; coordinate timing with progress meetings.

   a. In both value summary lists, tabulate "actual percent complete" and "cumulative value completed" with total at bottom.
   b. Submit value summary printouts three days before each regularly scheduled progress meeting.

2.5 REPORTS

A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:

   1. List of subcontractors at Project site.
   2. List of separate contractors at Project site.
3. Approximate count of personnel at Project site.
4. Equipment at Project site.
5. Material deliveries.
6. High and low temperatures and general weather conditions.
7. Accidents.
8. Meetings and significant decisions.
9. Unusual events (refer to special reports).
10. Stoppages, delays, shortages, and losses.
11. Meter readings and similar recordings.
13. Orders and requests of authorities having jurisdiction.
14. Change Orders received and implemented.
15. Construction Change Directives received and implemented.
16. Services connected and disconnected.
17. Equipment or system tests and startups.
18. Partial Completions and occupancies.
19. Substantial Completions authorized.

B. Material Location Reports: At monthly intervals, prepare and submit a comprehensive list of materials delivered to and stored at Project site. List shall be cumulative, showing materials previously reported plus items recently delivered. Include with list a statement of progress on and delivery dates for materials or items of equipment fabricated or stored away from Project site.

C. Field Condition Reports: Immediately on discovery of a difference between field conditions and the Contract Documents, prepare and submit a detailed report. Submit with a request for interpretation on CSI Form 13.2A. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

2.6 SPECIAL REPORTS

A. Reporting Unusual Events: When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating, response by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise Owner in advance when these events are known or predictable.

PART 3 - EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

A. Scheduling Consultant: Engage a consultant to provide planning, evaluation, and reporting using CPM scheduling.

B. Contractor's Construction Schedule Updating: At bi-weekly intervals, update schedule to reflect actual construction progress and activities. Issue schedule three days before each regularly scheduled progress meeting.

1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
3. As the Work progresses, indicate Actual Completion percentage for each activity.
C. Distribution: Distribute copies of approved schedule to Architect and Owner, subcontractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.

1. Post copies in Project meeting rooms and temporary field offices.
2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

END OF SECTION 01320
SECTION 01322 - PHOTOGRAPHIC DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for the following:
   1. Preconstruction photographs.
   2. Periodic construction photographs.
   3. Final Completion construction photographs.

B. Related Sections include the following:
   1. Division 1 Section "Submital Procedures" for submitting photographic documentation.
   2. Division 1 Section "Closeout Procedures" for submitting photographic negatives as Project Record Documents at Project closeout.

1.3 SUBMITTALS

A. Key Plan: Submit key plan of Project site and building with notation of vantage points marked for location and direction of each photograph. Indicate elevation or story of construction. Include same label information as corresponding set of photographs.

B. Construction Photographs: Submit three prints of four photographic views on a monthly basis from the time of commencement of work until a certificate of completion has been issued. For projects that last less than 2 months provide 3 submittals. The first one shall be a set of preconstruction photographs, the second shall be a set showing the project halfway thru, and the third shall be a final completion set of project photographs after substantial completion has been achieved.

C. Aerial Photographs:
   1. Provide aerial photographs of the site taken on or about the cutoff date for each scheduled Application for Payment or as otherwise required by the Owner.
   2. Employ professional commercial aerial photographer acceptable to the Project Consultant, to take construction record photographs periodically during the course of work. Photographer shall be a firm or individual of established reputation who has been regularly engaged as a professional aerial photographer for not less than two years. Provide two references for which the aerial photographer has performed work of similar nature during the preceding twelve (12) months.
   3. Aerial Photographs shall be high resolution, professional, crisp and clear looking.

D. Format and Identification:
1. Format: 8-by-10-inch smooth-surface matte prints on single-weight commercial-grade photographic paper, enclosed back to back in clear plastic sleeves that are punched for standard 3-ring binder.

2. Identification: On back of each print, provide an applied label or rubber-stamped impression with the following information:
   a. Name of Project.
   b. Name and address of photographer.
   c. Name of Architect.
   d. Name of Contractor.
   e. Date photograph was taken if not date stamped by camera.
   f. Description of vantage point, indicating location, direction (by compass point), and elevation or story of construction.
   g. Unique sequential identifier.

1.4 QUALITY ASSURANCE
   A. Photographer Qualifications: An individual who has been regularly engaged as a professional photographer of construction projects for not less than three years.

1.5 COORDINATION
   A. Auxiliary Services: Cooperate with photographer and provide auxiliary services requested, including access to Project site and use of temporary facilities, including temporary lighting required to produce clear, well-lit photographs without obscuring shadows.

1.6 USAGE RIGHTS
   A. Obtain and transfer copyright usage rights from photographer to Owner and Architect for unlimited reproduction of photographic documentation.
   B. Photographs shall not be released to parties other than the Owner and Project Consultant without the Owner’s permission.

1.7 ADDITIONAL ITEMS
   A. Negatives: Photographer shall retain photographic negatives for three years after date of Substantial Completion. During this period, photographer shall fill orders by Architect or Owner for extra prints. Photographer shall price extra prints at prevailing local commercial prices.
   B. Extra Prints: If requested by Architect, photographer shall prepare extra prints of photographs. Photographer shall distribute these prints directly to designated parties who will pay the costs for extra prints.
   C. Digital Images: Provide a CD or Flash Drive, with each submittal, containing digital images of the photographs. Digital Images shall be in JPEG format with minimum 1200 dpi resolution.
PART 2 - PRODUCTS

2.1 PHOTOGRAPHIC MEDIA

A. Photographic Film: 35 mm, medium speed (ISO 100-200) or digital 16 megapixels minimum.

PART 3 - EXECUTION

3.1 CONSTRUCTION PHOTOGRAPHS

A. Photographer: Engage a qualified commercial photographer to take construction photographs.

B. General: Take photographs using the maximum range of depth of field, and that are in focus, to clearly show the Work. Photographs with blurry or out-of-focus areas will not be accepted.

1. Maintain key plan with each set of construction photographs that identifies each photographic location.

C. Film Images:

1. Field Office Prints: Retain one set of prints of progress photographs in the field office at Project site, available at all times for reference. Identify photographs same as for those submitted to Architect.

D. Preconstruction Photographs: Before starting construction, take color photographs of Project site and surrounding properties, including existing items to remain during construction, from different vantage points, as directed by Architect.

1. Flag construction limits before taking construction photographs.
2. Take eight photographs to show existing conditions adjacent to property before starting the Work.
3. Take eight photographs of existing buildings either on or adjoining property to accurately record physical conditions at start of construction.
4. Take additional photographs as required to record settlement or cracking of adjacent structures, pavements, and improvements.

E. Aerial Photographs: See section 1.3 (C).

F. Periodic Construction Photographs: Take 18 to 20 digital color photographs weekly, with the cutoff date associated with each Application for Payment. Select vantage points to show status of construction and progress since last photographs were taken.

G. Final Completion Construction Photographs: Take eight color photographs after date of Substantial Completion for submission as Project Record Documents. Architect will direct photographer for desired vantage points.

H. Additional Photographs: Architect may issue requests for additional photographs, in addition to periodic photographs specified. Additional photographs will be paid for by Change Order and are not included in the Contract Sum.

1. Three days' notice will be given, where feasible.
2. In emergency situations, take additional photographs within 24 hours of request.
3. Circumstances that could require additional photographs include, but are not limited to, the following:

   a. Immediate follow-up when on-site events result in construction damage or losses.
   b. Photographs to be taken at fabrication locations away from Project site. These photographs are not subject to unit prices or unit-cost allowances.
   c. Substantial Completion of a major phase or component of the Work.
   d. Extra record photographs at time of final acceptance.

END OF SECTION 01322
SECTION 01330 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS
   A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 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 submittals.
   B. Related Sections include the following:
      1. Division 1 Section "Project Management and Coordination" for submitting and distributing meeting and conference minutes and for submitting Coordination Drawings.
      2. Division 1 Section "Construction Progress Documentation" for submitting schedules and reports, including Contractor's Construction Schedule and the Submittals Schedule.
      3. Division 1 Section "Photographic Documentation" for submitting construction photographs.
      4. Division 1 Section "Quality Requirements" for submitting test and inspection reports and for mockup requirements.
      5. Division 1 Section "Closeout Procedures" for submitting warranties.
      6. Division 1 Section "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.
      7. Division 1 Section "Operation and Maintenance Data" for submitting operation and maintenance manuals.
      8. Divisions 2 through 16 Sections for specific requirements for submittals in those Sections.

1.3 DEFINITIONS
   A. Action Submittals: Written and graphic information that requires Architect's responsive action.
   B. Informational Submittals: Written information that does not require Architect's responsive action. Submittals may be rejected for not complying with requirements.

1.4 SUBMITTAL PROCEDURES
   A. General: Electronic copies of CAD Drawings of the Contract Drawings may be provided by Architect for Contractor's use in preparing submittals. Cost for each CAD file will be $200 and paid by the contractor at the receipt of the file.
   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 reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

C. Submittals Schedule: Comply with requirements in Division 1 Section "Construction Progress Documentation" for list of submittals and time requirements for scheduled performance of related construction activities.

D. 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. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.

1. Initial Review: Allow 15 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
3. Resubmittal Review: Allow 15 days for review of each resubmittal.
4. Sequential Review: Where sequential review of submittals by Architect's consultants, Owner, or other parties is indicated, allow 21 days for initial review of each submittal.

E. Identification: Place a permanent label or title block on each submittal for identification.

1. Indicate name of firm or entity that prepared each submittal on label or title block.
2. Provide a space approximately 6 by 8 inches on label or beside title block to record Contractor's review and approval markings and action taken by Architect.
3. Include the following information on label for processing and recording action taken:
   a. Project name.
   b. Date.
   c. Name and address of Architect.
   d. Name and address of Contractor.
   e. Name and address of subcontractor.
   f. Name and address of supplier.
   g. Name of manufacturer.
   h. Submittal number or other unique identifier, including revision identifier.
   i. Number and title of appropriate Specification Section.
   j. Drawing number and detail references, as appropriate.
   k. Location(s) where product is to be installed, as appropriate.
   l. Other necessary identification.

F. Deviations: Highlight, encircle, and otherwise specifically identify deviations from the Contract Documents on submittals.

G. Additional Copies: Unless additional copies are required for final submittal, and unless Architect observes noncompliance with provisions in the Contract Documents, initial submittal may serve as final submittal.

1. Submit one copy of submittal to concurrent reviewer in addition to specified number of copies to Architect.
2. Additional copies submitted for maintenance manuals will be marked with action taken and will be returned.
H. Transmittal: Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Architect will return submittals, without review, received from sources other than Contractor.

1. Transmittal Form: Provide locations on form for the following information:
   a. Project name.
   b. Date.
   c. Destination (To:).
   d. Source (From:).
   e. Names of subcontractor, manufacturer, and supplier.
   f. Category and type of submittal.
   g. Submittal purpose and description.
   h. Specification Section number and title.
   i. Drawing number and detail references, as appropriate.
   j. Transmittal number, numbered consecutively.
   k. Submittal and transmittal distribution record.
   l. Remarks.
   m. Signature of transmitter.

2. On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Architect on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same label information as related submittal.

3. Submit CONTRACTOR’S SHOP DRAWING SUBMITTAL CERTIFICATION at the end of this section with each submittal. Submittals without the certification will be returned without action.

I. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.

1. Note date and content of previous submittal.
2. Note date and content of revision in label or title block and clearly indicate extent of revision.
3. Resubmit submittals until they are marked "Reviewed" or "Reviewed as Noted".

J. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

K. Use for Construction: Use only final submittals with mark indicating "Reviewed" or “Reviewed as Noted” taken by Architect.

L. All shop drawings and samples are to be submitted in the following groups. All data is to be reviewed by Contractor as indicated in Sections 01330. Submittal groups must be complete - Incomplete submittals will be rejected.

M. Contractor shall provide submittals only for those disciplines that apply to the particular scope of work of the project. If, for example, no mechanical work is in the scope of work, then HVAC submittals will not be required.

GROUP SUBMITTALS are as follows:

1. Architectural
   Group 1: Roofing.
   Group 2: Glazing, Curtain Wall, Storefront
   Group 3: Four-Fold Apparatus Bay Doors and Overhead Doors
   Group 4: Wind Driven Rain Louvers
   Group 5: Bollards and any other exterior work
   Group 6: Structural strengthening of buildings
PART 2 - PRODUCTS

2.1 ACTION SUBMITTALS

A. General: Prepare and submit Action Submittals required by individual Specification Sections.

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. Standard product operation and maintenance manuals.
   j. Compliance with specified referenced standards.
   k. Testing by recognized testing agency.
   l. Notation of coordination requirements.

4. Submit Product Data before or concurrent with Samples.
5. Number of Copies: Submit six copies of Product Data, unless otherwise indicated. Architect will return three copies. Mark up and retain one returned copy as a Project Record Document.

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: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
   a. Dimensions.
   b. Identification of products.
   c. Fabrication and installation drawings.
   d. Roughing-in and setting diagrams.
   e. Schedules.
   f. Design calculations.
   g. Compliance with specified standards.
   h. Notation of coordination requirements.
   i. Notation of dimensions established by field measurement.
   j. Relationship to adjoining construction clearly indicated.
   k. Seal and signature of professional engineer if specified.
   l. Wiring Diagrams: Differentiate between manufacturer-installed and field-installed wiring.

2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches but no larger than 24 by 36 inches.
3. Number of Copies: Submit six opaque copies of each submittal, unless copies are required for operation and maintenance manuals. Submit two additional copies where copies are required for operation and maintenance manuals. Architect will retain two copies; remainder will be returned. Mark up and retain one returned copy as a Project Record Drawing.

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

1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
2. Identification: Attach label on unexposed side of Samples that includes the following:
   a. Generic description of Sample.
   b. Product name and name of manufacturer.
   c. Sample source.
   d. Number and title of appropriate Specification Section.

3. 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 not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.

4. 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.
   a. Number of Samples: Submit TWO full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return submittal with options selected.

5. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
   a. Number of Samples: Submit six sets of Samples. Architect will retain two Sample sets; remainder will be returned. Mark up and retain one returned Sample set as a Project Record Sample.
      1) Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
      2) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.

E. Product Schedule or List: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:

1. Type of product. Include unique identifier for each product.
2. Number and name of room or space.
3. Location within room or space.
4. Number of Copies: Submit six copies of product schedule or list, unless otherwise indicated. Architect will return two copies.
   a. Mark up and retain one returned copy as a Project Record Document.

F. Submittals Schedule: Comply with requirements specified in Division 1 Section "Construction Progress Documentation."

G. Application for Payment: Comply with requirements specified in Division 1 Section "Payment Procedures."

H. Schedule of Values: Comply with requirements specified in Division 1 Section "Payment Procedures."

I. 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. Use CSI Form 1.5A. 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.
   4. Number of Copies: Submit six copies of subcontractor list, unless otherwise indicated. Architect will return two copies.
       a. Mark up and retain one returned copy as a Project Record Document.

2.2 INFORMATIONAL SUBMITTALS

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

   1. Number of Copies: Submit 6 copies of each submittal, unless otherwise indicated. Architect will not return copies.
   2. Certificates and Certifications: Provide a notarized statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
   3. Test and Inspection Reports: Comply with requirements specified in Division 1 Section "Quality Requirements."

B. Coordination Drawings: Comply with requirements specified in Division 1 Section "Project Management and Coordination."

C. Contractor's Construction Schedule: Comply with requirements specified in Division 1 Section "Construction Progress Documentation."

D. 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.

E. Welding Certificates: When applies to the project, prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification (WPS) and Procedure Qualification Record (PQR) on AWS forms. Include names of firms and personnel certified.

F. Installer Certificates: Prepare written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
G. Manufacturer Certificates: Prepare written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.

H. Product Certificates: Prepare written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.

I. Material Certificates: Prepare written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.

J. 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 in the Contract Documents.

K. Product Test Reports: Prepare written reports indicating current product produced by manufacturer complies with requirements in the Contract Documents. 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. Research/Evaluation Reports: Prepare written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:
   1. Name of evaluation organization.
   2. Date of evaluation.
   3. Time period when report is in effect.
   4. Product and manufacturers' names.
   5. Description of product.
   6. Test procedures and results.
   7. Limitations of use.

M. Schedule of Tests and Inspections: Comply with requirements specified in Division 1 Section "Quality Requirements."

N. 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 in the Contract Documents.

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

P. 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.

Q. 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.

R. 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.

S. 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.

T. Construction Photographs: Comply with requirements specified in Division 1 Section "Photographic Documentation."

2.3 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.

B. Delegated-Design Submittal: In addition to Shop Drawings, Product Data, and other required submittals, submit six copies of 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.

1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

A. Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.

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.

3.2 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 will review each submittal, make marks to indicate corrections or modifications required, and return it. Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action taken, as follows:

1. **Final Unrestricted Release**: Where the submittals are marked as follows, the work covered by the submittal may proceed provided it complies with the requirements of the Contract Documents; acceptance of the work will depend upon that compliance.

   **Marking**: "Reviewed"

2. **Final-But-Restricted Release**: When the submittals are marked as follows, the work covered by the submittal may proceed provided it complies with both the Architect's/Engineer's notations or corrections on the submittal and with the requirements of the contract documents; acceptance of the work will depend on that compliance.

   **Marking**: "Reviewed as Noted".

3. **Returned for Re-Submittal**: When the submittal is marked as follows do not proceed with the work covered by the submittal, including purchasing, fabrication, delivery, or other activity. Revise the submittal or prepare a new submittal in accordance with the Architect's/Engineer's notations stating the reasons for returning the submittal; re-submit the submittal without delay. Repeat if necessary to obtain a different action marking. Do not permit submittals with the following marking to be used at the project site, or elsewhere where work is in progress.

   **Marking**: “Rejected”
   **Marking**: “Revise and Resubmit”
   **Marking**: “Submit Specified Item”

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

D. Partial submittals are not acceptable, will be considered non-responsive, and will be returned without review.

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

F. Submit CONTRACTOR’S SHOP DRAWING SUBMITTAL CERTIFICATION at the end of this section with each submittal. Failure to submit required certification will result in rejection of the submittal. Additional time or compensation will not be given to the Contractor for delays caused by the contractor not following the stated submittal requirements.

G. The first submittal for each required item will be reviewed free of charge. Each subsequent submittal review, for previously failed or incomplete submittals, will be billed on an hourly basis at $150 / hr. Contractor shall be responsible for payment of rejected submittals on a monthly basis. Non-payment will result in termination of review services.

**END OF SECTION 01330**
CONTRACTOR’S SHOP DRAWING SUBMITTAL CERTIFICATION

Project Name:  
Owner:  
Contractor:  

Date:  

Submittal Title:  
Specification Section:  
Submittal Group:  

I, ____________________, as the Roofing Contractor’s authorized representative of the said project, certify that the attached shop drawing submittal complies specification section 1330, all other applicable specification sections, and the construction documents. I have reviewed the shop drawings submitted by the suppliers or sub-contractors and the following conditions have been satisfied:

Yes No N/A

☐ ☐ ☐ Have minimum required quantity of submittals attached. Number of submittals _____

☐ ☐ ☐ Have you reviewed the shop drawing submittal for conformance with the plans and specifications. All dimensions been cross-checked with plans and field verified for actual dimensions.

☐ ☐ ☐ Have you marked all applicable options and accessories to be supplied or required.

☐ ☐ ☐ Have you coordinated with all other trades or associated items (i.e. elec. voltage, data, water supply, venting, etc.)

☐ ☐ ☐ Is the submitted product identical to the specified item in section _____

☐ ☐ ☐ If a substitution, has the substitution been approved during the bid phase.

☐ ☐ ☐ All deviations from the plans or specification have been clearly identified on each page.

☐ ☐ ☐ For all exterior components, are the Metro-Dade product approvals attached

☐ ☐ ☐ Have you reviewed the Metro-Dade product approval.

☐ ☐ ☐ For sample specified, are material samples with specified finish and color attached

☐ ☐ ☐ If sign and sealed engineering is specified, are the engineering calculations attached.

☐ ☐ ☐ If manufacturer’s product data is specified, is the information attached

☐ ☐ ☐ Have you reviewed and noted manufacturer’s instructions and recommendations

☐ ☐ ☐ If a warranty is specified, is a sample warranty for the specified period attached.

☐ ☐ ☐ If installer’s qualification certification specified, is the certification attached.

☐ ☐ ☐ If Producer’s Statement of applicability required, is one attached.

If you answered ‘NO’ to any question listed above, do not forward the submittal to the Architect. It will not be reviewed. All reviews after the first review, will be billed directly to the Roofing Contractor.

Signature ____________________  Title____________  Date___________
SECTION 01400 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for quality assurance and quality control.

B. 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-assurance and 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 other quality-assurance and control procedures that facilitate compliance with the Contract Document requirements.

3. Requirements for Contractor to provide quality-assurance and control services required by Architect, Owner, or authorities having jurisdiction are not limited by provisions of this Section.

C. Related Sections include the following:

1. Division 1 Section "Construction Progress Documentation" for developing a schedule of required tests and inspections.

2. Division 1 Section "Project Record Documents" for final testing reports, inspection records, and certifications.

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 substantiate that proposed construction will comply with requirements.

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

C. Mockups: Full-size, physical assemblies that are constructed on-site. 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. Approved mockups establish the standard by which the Work will be judged.
D. Laboratory Mockups: Full-size, physical assemblies that are constructed at testing facility to verify performance characteristics.

E. Preconstruction Testing: Tests and inspections that are performed specifically for the Project before products and materials are incorporated into the Work to verify performance or compliance with specified criteria.

F. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with industry standards.

G. Source Quality-Control Testing: Tests and inspections that are performed at the source, i.e., plant, mill, factory, or shop.

H. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.

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

J. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.

1. Using a term such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to tradespeople of the corresponding generic name.

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

1.4 CONFLICTING REQUIREMENTS

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

B. Quantities or Amounts: If conflict arises on the quantity or amount of a particular item or material, Contractor shall include in his/her bid the one of greater quantity or amount between the two. Contractor shall inform Architect’s office of conflict prior to ordering any materials.

C. Systems or Conditions: If conflict arises between two systems or conditions, Contractor shall include in his/her bid the one of highest cost. Contractor shall inform Architect’s office of conflict prior to ordering any materials.

D. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.
1.5 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. 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.

C. Reports: Prepare and submit certified written reports that 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.
   8. Complete test or inspection data.
   9. Test and inspection results and an interpretation of test results.
  10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
  11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
  12. Name and signature of laboratory inspector.
  13. Recommendations on retesting and reinspecting.

D. 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 QUALITY ASSURANCE

A. General: Qualifications paragraphs in this Article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.

B. 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.

C. 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, as well as sufficient production capacity to produce required units.
D. 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.

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 regulations governing the Work.

G. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 548; and with additional qualifications specified in individual Sections; and where required by authorities having jurisdiction, that is acceptable to authorities.

1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.

H. 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.

1.7 QUALITY CONTROL

A. Tests and inspections are Contractor's responsibility. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.

1. Contractor's responsibility is to engage a qualified testing agency to perform these quality-control services.
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. The following tests, inspections, and certifications shall be performed by independent testing agencies, special inspectors, or professional engineers hired by the contractor to provide quality control services:
   a. Insulation certification.
   b. Roof completion moisture survey.

B. 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 as specified in Division 1 Section "Submittal Procedures."
C. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.


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

E. 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. Preliminary design mix proposed for use for material mixes that require control by testing agency.
6. Security and protection for samples and for testing and inspecting equipment at Project site.

F. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and 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.

G. 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.

1.8 SPECIAL TESTS AND INSPECTIONS

A. Special Tests and Inspections: Contractor will engage and pay for a qualified testing agency, special inspector, or professional engineer to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner, and as follows:

1. Notifying Architect and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
2. Submitting six copies of a certified written report of each test, inspection, and similar quality-control service to Architect with copy to Contractor and to authorities having jurisdiction.
3. Submitting a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
4. Interpreting tests and inspections and stating in each report whether tested and inspected work complies with or deviates from the Contract Documents.
5. Retesting and reinspectng corrected work.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

A. Prepare a record of tests and inspections. Include the following:
   1. Date test or inspection was conducted.
   2. Description of the Work tested or inspected.
   3. Date test or inspection results were transmitted to Architect.
   4. Identification of testing agency or special inspector conducting test or inspection.

B. Maintain log at Project site. Post changes and modifications as they occur. Provide access to test and inspection log for Architect's reference during normal working hours.

3.2 REPAIR AND PROTECTION

A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
   1. Provide materials and comply with installation requirements specified in other Specification Sections. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible.

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

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

END OF SECTION 01400
SECTION 01410 – REGULATORY REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for quality assurance and quality control, but not limited to, the following:
   1. Description of Requirements
   2. Codes and Standards
   3. Governing Regulations and Authorities
   4. Submittal

B. Related Sections include the following:
   1. Division 1 Section "Quality Requirements"

1.3 DESCRIPTION OF REQUIREMENTS

A. General:
   1. This section specifies procedural and administrative requirements for compliance with governing regulations and codes and standards imposed upon the Work. These requirements include obtaining permits, licenses, inspections, releases and similar requirements associated with the regulations, codes and standards.
   2. The term “Regulations” is defined to include laws, statutes, ordinances, and lawful orders issued by governing authorities, as well as those rules, conventions and agreements within the construction industry which effectively controls the performance of the Work regardless of whether they are lawfully imposed by governing authority or not.
   3. Governing Authority: For requirements related to compliance with governing regulations, refer to:
      1) City of North Lauderdale
      2) Broward County
      3) State of Florida
   4. General Requirements: Provisions and requirements of the Contract, the General Conditions of the Contract, the Supplementary Conditions of the Contract, and other Division 1 specification sections apply to the entire Work defined by the Construction Documents. As such, there is no need to separately enumerate the application of those documents within the individual specification sections or the drawings.

1.4 DEFINITIONS

A. Certain terms used in the Construction Documents are defined in this Section. Definitions and explanations contained in this Section are not necessarily complete, but are general for the Work
to the extent that they are not stated more explicitly in another document within the Construction Documents.

1. **Indicated**: refers to graphic representations, notes or schedules on the Drawings, or other Paragraphs or Schedules in Specifications, and similar requirements in Construction Documents. Where terms such as "shown," "noted," "scheduled," and "specified" are used, it is to help locate the reference; no limitation on location is intended except as specifically noted.

2. **Directed**: Terms such as "directed", "requested", "authorized", "selected", "approved", "required", and "permitted" mean "directed by the Architect", "requested by the Architect", and similar phrases. However, no implied meaning shall be interpreted to extend the Architect's responsibility into the Contractor’s area of construction supervision.

3. **Approve**: The term "approved," where used in conjunction with the Architect's action on the Contractor’s submittals, applications, and requests, is limited to the duties and responsibilities of the Architect as stated in the Contract, General and Supplementary Conditions of the Contract or other Division 1 Specifications. Such approval shall not release the Contractor from responsibility to fulfill Contract requirements unless otherwise provided in the Construction Documents.

4. **Furnish**: The term "furnish" is used to mean "supply and deliver to the Project site, ready for unloading, unpacking, assembly, installation, and similar operations."

5. **Install**: The term "install" is used to describe operations at project site including the actual "unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations."

6. **Provide**: The term "provide" means "to furnish and install, complete and ready for the intended use."

7. **Project Site**: is the space available to the Contractor for performance of construction activities, either exclusively or in conjunction with others performing other construction activities as part of the Project. The extent of the Project Site is shown on the Drawings and may or may not be identical with the description of the land upon which the Project is to be built.

8. **Testing Laboratories**: A "testing laboratory" is an independent entity engaged to perform specific inspections or tests, either at the Project Site or elsewhere, and to report on and, if required, to interpret results of those inspections or tests.

1.5 **CODES AND STANDARDS**

A. Except where earlier editions are specifically indicated, latest editions with current revisions and amendments of the following codes and standards are considered minimum requirements for materials, workmanship and safety where not covered elsewhere in these specifications.

B. **Codes and Standards**:  
1. Obtain copies of the following regulations (unless otherwise indicated) and retain at the project site, available for reference by parties who have a reasonable need for such reference:
   d. ASCE 7-10
   e. OSHA safety standards.
1.6 GOVERNING REGULATIONS/AUTHORITIES FEES

A. Coordinate inspections and regulatory requirements of the agencies specified above under provisions of Division 1 Section "Quality Requirements".

B. Contractor shall obtain all permits.
   1. Contractor will pay for Building Permit and all other agency fees through a permit allowance.
   2. If required, any impact fees to the County or other agencies will be paid by the Contractor through a permit allowance.

1.7 SUBMITTALS

A. Licenses and Certificates: Submit copies of licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments and similar documents, correspondence and records established in conjunction with compliance with standards and regulations bearing upon the performance of the Work.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01410
SECTION 01420 – REFERENCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for quality assurance and quality control.

B. Related Sections include the following:
   1. Division 1 Section "Regulatory Requirements"
   2. Division 1 Section "Quality Assurance"

1.3 DRAWING SYMBOLS

A. Except as otherwise indicated, graphic symbols used on the drawings are those symbols recognized in the construction industry for the purposes indicated. Where not otherwise noted, symbols are defined by “Architectural Graphic Standards”, published by John Wiley & Sons, Inc., eleventh edition or later.

B. Refer instances of uncertainty to the Project Consultant for clarification prior to proceeding.

1.4 SPECIFICATION FORMAT AND CONTENT EXPLANATION

A. Specification Format: These Specifications are organized into Divisions and Sections based on the Construction Specifications Institute's 16 Division format and MASTERFORMAT numbering system.

B. Specification Conventions: This Specification uses certain conventions in the use of language and the intended meaning of certain terms, words, and phrases when used in particular situations or circumstances. These conventions are explained as follows:

   1. Abbreviated Language: Language used in the Specifications and other Contract Documents is the abbreviated type. Implied words and meanings will be appropriately interpreted. Singular words will be interpreted as plural and plural words interpreted as singular where applicable and where the full context of the Contract Documents so indicates.

   2. Imperative and streamlined language is used generally in the Specifications. Requirements expressed in the imperative mood are to be performed by the Contractor. At certain locations in the text, for clarity, subjective language is used to describe responsibilities that must be fulfilled indirectly by the Contractor, or by others when so noted.
3. The words "shall be" shall be included by inference wherever a colon (:) is used within a sentence or phrase.

4. Abbreviations: Actual word abbreviations of a self-explanatory nature may be included within the Project Manual. Specific abbreviations have been established, principally for lengthy technical terminology and primarily in conjunction with coordination of specifications with notations on drawings and schedules. These abbreviations are frequently defined in the specification section at the first instance of use. Trade association names and titles of general standards are frequently abbreviated. Singular words will be interpreted as plural and plural word will be interpreted as singular where applicable and where full context of the Contract Documents so indicates. Refer instances of uncertainty to the Project Consultant for decision prior to proceeding.

C. Specification Content:
1. The techniques or methods of specifying to record requirements vary throughout the Project Manual. These methods may include: “prescriptive”, “open generic-descriptive”, “compliance with standards”, “performance”, “proprietary” or a combination of these. The method used for specifying one element of the Work has no bearing on requirements for another element of the Work.

2. Overlapping and Conflicting Requirements: Where compliance with two (2) or more industry standards or sets of requirements is specified, and overlapping of those different standards establishes different or conflicting minimums or levels of quality, the most stringent (which is generally recognized to also be the most costly) is intended and will be enforced--unless specifically detailed language written into the Contract Documents (not by way of reference to an industry standard) clearly indicates that a less stringent requirement is to be fulfilled. Refer apparently-equal-but-different requirements and other uncertainties to the Project Consultant for a decision prior to proceeding.

3. Refer to Quality Requirement Section for more information on Conflicting Requirements.

D. Minimum Quality/Quantity: In every instance, quality level or quantity shown or specified is intended as minimum for the Work to be performed or provided. Except as otherwise specifically indicated, actual Work may either comply exactly with that minimum (within reasonable specified tolerances), or may exceed that minimum within reasonable limits. In complying with these requirements, indicated numeric values are either minimums or maximums as not or as appropriate for the context of the requirements. Refer instances of uncertainty to the Project Consultant for decision prior to proceeding.

E. Assignment of Specialists: The Specification requires that certain specific construction activities shall be performed by specialists who are recognized experts in the operations to be performed. The specialists must be engaged for those activities, and assignments are requirements over which the Contractor has no choice or option. Nevertheless, the ultimate responsibility for fulfilling Contract requirements remains with the Contractor.

1. This requirement shall not be interpreted to conflict with enforcement of building codes and similar regulations governing the Work. It is also not intended to interfere with local trade union jurisdictional settlements and similar conventions.

2. Trades: Use of titles such as "carpentry" is not intended to imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to tradespersons of the corresponding generic name.
1.5 INDUSTRY STANDARDS

A. Applicability of Standards: Except where the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents. Such standards are made a part of the Contract Documents by reference. Individual Sections indicate which codes and standards the Contractor must keep available at the Project Site for reference.

B. Publication Dates: Where the date of issue of a referenced standard is not specified, comply with the standard in effect as of date of Contract Documents.
   1. Updated Standards: At the request of the Project Consultant, Contractor, or authority having jurisdiction, submit a Change Order proposal where an applicable code or standard has been revised and reissued after the date of the Contract Documents and before performance of Work affected. The Project Consultant and Owner will decide whether to issue a Change Order to proceed with the updated standard.

C. Copies of Standards:
   1. Each entity engaged in construction on the Project is required to be familiar with industry standards applicable to that entity's construction activity. Copies of applicable standards are not bound with the Contract Documents.
   2. Where copies of standards are needed for performance of a required construction activity, the Contractor shall obtain copies directly from the publication source.
   3. Although copies of standards needed for enforcement of requirements also may be included as part of required submittals, the Project Consultant reserves the right to require the Contractor to submit additional copies as necessary for enforcement of requirements.

D. Abbreviations and Names: Trade association names and titles of general standards are frequently abbreviated. Where such acronyms or abbreviations are used in the Specifications or other Contract Documents, they mean the recognized name of the trade association, standards generating organization, authority having jurisdiction, or other entity applicable to the context of the text provision. Refer to the "Encyclopedia of Associations," published by Gale Research Co. or other similar guides available from The Construction Specifications Institute, American Institute of Architects, etc.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01420
SECTION 01430 – QUALITY ASSURANCE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS
A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY
A. This Section includes administrative and procedural requirements for quality assurance, but not limited to, the following:
   1. Fabricator’s Qualifications
   2. Installer’s Qualifications
   3. Manufacturer’s Qualifications
   4. Manufacturer’s Field Services
   5. Supplier Qualifications
   6. Professional Engineer Qualifications
   7. Testing And Inspection Agency Qualifications
   8. Broward County Licensure Requirements.

B. Related Sections include the following:
   1. Division I Section "Submittal Procedures". Submission of Manufacturers' Instructions and Certificates and other documentation.

1.3 FABRICATOR’S QUALIFICATIONS
A. A “Fabricator” is the Contractor or an entity engaged by the Contractor, either as an employee, subcontractor or sub-subcontractor to construct assemblies required for the Work from diverse, usually standardized manufactured parts or components either on the project site or in a shop setting.

B. The term "experienced," when used with the term "fabricator" means:
   1. Having a minimum of five (5) previous consecutive years of experience in the regular fabrication of assemblies, sub-assemblies or components similar to those specified, and
   2. Being familiar with the requirements of Broward County, Florida, High Velocity Hurricane Zone.

C. Fabricators, and the Contractor’s workforce in general, are required to comply with the workforce composition requirements specified in General Conditions and further specified below.
1.4 INSTALLER’S QUALIFICATIONS

A. An "Installer" is the Contractor or an entity engaged by the Contractor, either as an employee, subcontractor, or sub-subcontractor for performance of a particular construction activity, including installation, erection, application, and similar operations. Installers are required to be experienced in the operations they are engaged to perform.

B. The term "experienced," when used with the term "Installer" means:
   1. Having a minimum of (5) previous Projects similar in size and scope to this Project,
   2. Being familiar with the precautions required.
   3. Having complied with the workforce composition and other requirements of Broward County, Florida and other jurisdictional authorities involved in the Work.

C. Provide the levels of more extensive experience that may be specified within the respective specification sections contained in this Project Manual.

D. Installers, and the Contractor’s workforce in general, are required to comply with the workforce composition requirements specified in General Conditions and further specified below.

1.5 MANUFACTURER’S QUALIFICATIONS

A. A “Manufacturer” is a person or entity who produces materials or equipment for the Work, including that manufactured to a special design, but who does not perform labor at the site. Manufacturers are required to be experienced in the operations they are engaged to perform.

B. The term "experienced," when used with the term "Manufacturer" means:
   1. Having a minimum of (5) previous consecutive years of experience in the regular manufacture of products, materials, components and assemblies similar to those specified, and
   2. Being familiar with the requirements of Broward County, Florida, High Velocity Hurricane Zone.

C. Upon request, provide:
   1. Location of the Manufacturer including foreign or domestic status.
   2. Evidence of the time period in which the manufacturer has been producing the specified products, materials, components or assemblies without formulation, engineering, design or other production changes which would alter or modify their performance characteristics.
   3. Listings of the manufacturer’s authorized franchised distributors, installers or applicators.
   4. Manufacturer’s latest product performance criteria and test results.
   5. List of the manufacturer’s technical services and their local availability.
   6. Other pertinent information to establish the capacity, capability and quality of the manufacturer as may be requested by the Project Consultant or Owner.

D. The Owner reserves the right to require replacement of any manufacturer to whom reasonable objection is made by the Owner or Project Consultant.

1.6 MANUFACTURER’S FIELD SERVICES

A. Submit qualifications of manufacturer’s, suppliers, distributors or other entity’s observers to Project Consultant and Owner (30) days in advance of required observations. Observer subject to approval of Project Consultant and Owner and the Owner reserves the right to replace any observer for whom reasonable objection is made.
B. When specified in individual specification Sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, or other conditions as applicable, and to initiate instructions when necessary.

C. Individuals to report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

D. Submit report in duplicate within (15) days of observation to Owner for review.

1.7 SUPPLIER QUALIFICATIONS

A. A “Supplier” is a person or entity who supplies materials or equipment for the Work, including that fabricated to a special design, but who does not perform labor at the site. Suppliers are required to be experienced in the operations they are engaged to perform.

B. The term "experienced," when used with the term "Supplier" means:

1. Having supplied products or materials for a minimum of (5) previous projects similar in size and scope to the Work specified herein.
2. Having been in the regular business of supplying similar products and materials for the preceding consecutive (3) years, and
3. Being familiar with the requirements of Broward County, Florida, High Velocity Hurricane Zone.

C. The Owner reserves the right to require replacement of any Supplier to whom reasonable objection is made by the Owner or the Project Consultant.

1.8 PROFESSIONAL ENGINEER QUALIFICATIONS

A. 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

1.9 TESTING AND INSPECTION AGENCY QUALIFICATIONS

A. An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 548; and with additional qualifications specified in individual Sections; and where required by authorities having jurisdiction, that is acceptable to authorities.
1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.

B. Testing and Inspection Agencies may be hired, paid for and utilized by the Contractor for the Contractor’s use at no additional expense to the Owner except as otherwise provided in the Contract Documents.

C. Such testing and inspection agencies: meet the following qualifications:
1. Laboratory: Authorized to operate in State in which Project is located.
2. Laboratory Staff: Maintain a full time registered Engineer and the necessary specialists on staff to review services.
3. Testing Equipment: Calibrated at reasonable intervals with devices of an accuracy traceable to either National Bureau of Standards or accepted values of natural physical constants.

1.10 LICENSURE REQUIREMENTS

A. The City requires the utilization of a workforce, which holds State of Florida Certification, or a certificate of competency obtained through a proctored examination for the following crafts or trades. Ensure compliance with the licensure requirements if the listed crafts or trades (as mandated by Chapter 489 of the Florida Statutes and Broward County Ordinance 90-45 respectively) are required for the execution of the Work:

1. Plumbing and Specialty Plumbing Contractors:
   a. Master Plumber
   b. Specialty Plumbing Contractors:
      1) Lawn Sprinkler Plumber
      2) Master Natural Gas Fitter
      3) Solar Heat Installer
   c. Journeyman Plumber
   d. Journeyman Natural Gas Fitter: Specialty Journeyman Plumber

2. Electrical and Specialty Electrical Contractors:
   a. Master Electrician
   b. Specialty Electricians:
      1) Burglar Alarm Electrician
      2) Central Community TV and Radio Specialty Contractor
      3) Electrical Sign Master Electrician
      4) Fire Alarm Electrician
      5) Lightning Protection Systems Contractor
      6) Low Voltage Electrician
      7) Communications
   c. Journeyman Electrician
   d. Electrical Sign Journeyman
   e. Maintenance Electrician Journeyman

3. Mechanical and Specialty Mechanical Contractors:
   a. Sheet Metal Contractor
   b. Class A Air Conditioning Contractor
   c. Mechanical Contractor
   d. Transport Assembly Contractor
   e. Insulation Contractor
   f. Central Vacuum System Contractor
   g. Pneumatic Control Contractor
   h. Specialty Mechanical Technicians
   i. Specialty Air Conditioning Technicians Class "C"
   j. Specialty Air Conditioning Technicians Class "D":
      1) Class "A" Refrigeration Technician
      2) Class "B" Refrigeration Technician
      3) Warm Air Heating Technician
      4) Insulation Contractor
      5) Mechanical Maintenance Technician
**Mechanical Journeyman:**
1) Insulation Journeyman
2) Journeyman Mechanical Technician
3) Sheet Metal Journeyman

**General and Specialty Building Contractors:**

<table>
<thead>
<tr>
<th>Category</th>
<th>Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Building - Class &quot;A&quot; - Unlimited</td>
<td></td>
</tr>
<tr>
<td>General Building - Class &quot;B&quot; - Commercial</td>
<td></td>
</tr>
<tr>
<td>General Building - Class &quot;C&quot; - Residential</td>
<td></td>
</tr>
<tr>
<td>Limited Specialty Building Categories:</td>
<td></td>
</tr>
<tr>
<td>Acoustical Ceilings Category - Class &quot;A&quot;</td>
<td></td>
</tr>
<tr>
<td>Awning Erection Category - Class &quot;AE&quot;</td>
<td></td>
</tr>
<tr>
<td>Cabinet Installation Category - Class &quot;C&quot;</td>
<td></td>
</tr>
<tr>
<td>Concrete Placing and Finishing Category - Class &quot;CP&quot;</td>
<td></td>
</tr>
<tr>
<td>Demolition Category (Nonexplosive) - Class &quot;A&quot;</td>
<td></td>
</tr>
<tr>
<td>Down Spouts and Gutters: Under Miscellaneous metals or roofing.</td>
<td></td>
</tr>
<tr>
<td>Drywall and Lathing Category - Class &quot;DL&quot;</td>
<td></td>
</tr>
<tr>
<td>Elevator Installation and Maintenance Category - Class &quot;E&quot;</td>
<td></td>
</tr>
<tr>
<td>Fence Erection Category - Class &quot;F&quot;</td>
<td></td>
</tr>
<tr>
<td>Finish Carpentry Category - Class &quot;FC&quot;</td>
<td></td>
</tr>
<tr>
<td>Flooring Category - Class &quot;FL&quot;</td>
<td></td>
</tr>
<tr>
<td>Glazing Category - Class &quot;G&quot;</td>
<td></td>
</tr>
<tr>
<td>Gunite Category - Class &quot;GU&quot;</td>
<td></td>
</tr>
<tr>
<td>Insulation Category - Class &quot;I&quot;</td>
<td></td>
</tr>
<tr>
<td>Masonry Category - Class &quot;M&quot;</td>
<td></td>
</tr>
<tr>
<td>Miscellaneous Metals Erection Category - Class &quot;MM&quot;</td>
<td></td>
</tr>
<tr>
<td>Painting (Interior and Exterior) Category - Class &quot;P&quot;</td>
<td></td>
</tr>
<tr>
<td>Painting Unlimited Category - Class &quot;PU&quot;</td>
<td></td>
</tr>
<tr>
<td>Plastering and Stucco Category - Class &quot;PS&quot;</td>
<td></td>
</tr>
<tr>
<td>Roof Decks Category - Class &quot;RD&quot;</td>
<td></td>
</tr>
<tr>
<td>Roof Painting and Cleaning Category - Class &quot;RP&quot;</td>
<td></td>
</tr>
<tr>
<td>Roofing Category - Class &quot;R&quot;</td>
<td></td>
</tr>
<tr>
<td>Rough Carpentry and Framework Category - Class &quot;RC&quot;</td>
<td></td>
</tr>
<tr>
<td>Screen Enclosures Category - Class &quot;SC&quot;</td>
<td></td>
</tr>
<tr>
<td>Sign Erection Category - Class &quot;SE&quot;</td>
<td></td>
</tr>
<tr>
<td>Steel Reinforcing and Iron Category - Class &quot;SR&quot;</td>
<td></td>
</tr>
<tr>
<td>Structural Steel Category - Class &quot;SS&quot;</td>
<td></td>
</tr>
<tr>
<td>Tile and Marble Category - Class &quot;TM&quot;</td>
<td></td>
</tr>
<tr>
<td>Waterproofing Category - Class &quot;W&quot;</td>
<td></td>
</tr>
</tbody>
</table>

**PART 2 - PRODUCTS (Not Used)**

**PART 3 - EXECUTION (Not Used)**

**END OF SECTION 01430**
SECTION 01500 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS
   A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY
   A. This Section includes requirements for temporary utilities, support facilities, and security and protection facilities.
   B. Related Sections include the following:
      1. Division 1 Section "Construction Waste Management."
      2. Division 1 Section "Temporary Barriers and Enclosures."

1.3 USE CHARGES
   A. General: Cost or use charges for temporary facilities shall be included in the Contract Sum. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Owner’s staff, Architect, occupants of Project, testing agencies, and authorities having jurisdiction.
   B. Sewer Service: Pay sewer service use charges for sewer usage by all entities for construction operations.
   C. Water Service: Pay water service use charges for water used by all entities for construction operations.
   D. Electric Power Service: Pay electric power service use charges for electricity used by all entities for construction operations.

1.4 SUBMITTALS
   A. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.

1.5 QUALITY ASSURANCE
   A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
   B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

1.6 PROJECT CONDITIONS
A. 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.

1.7 EXISTING CONDITIONS

A. The facility is in use every day of the week. The Contractor is required to perform the needed work for his construction effort in a way that does not disturb the function or interrupt ongoing operations. All work must be coordinated and scheduled with approval from City staff. Contractor shall provide temporary fencing, barricades, signage, and all other means necessary to protect the public from harm. Contractor shall provide protected temporary access paths to all existing facilities adjacent to the construction area. Contractor shall frequently remove all construction debris from the protected temporary access paths and areas outside the work limits, but not less than once a day. Contractor shall remove temporary paths and restore those areas after the construction work is complete.

B. Contractor shall coordinate with the Owner and submit plan to the Architect for approval.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Chain-Link Fencing: Minimum 2-inch, 0.148-inch- thick, galvanized steel, chain-link fabric fencing; minimum 8-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. Provide screen mesh vision barrier. Provide minimum (2) 12’ wide x 8’ high gates for construction access.

B. Traffic Barricades: High-visibility Water-filled Plastic Jersey barriers for use in construction areas, temporary work zones to ensure safety and minimize damage to vehicles. Provide flashing lights for night-time visibility.

C. Field Offices, General: Not required for this project.

D. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.

1. Store combustible materials apart from building.

E. Environmental Protection: Provide Best Management Practices environmental protection equipment to prevent air, soil, and water pollution in and around the project site. BMP’s shall comply with contract specifications, FDEP regulations and FDOT standards. Contractor shall be solely liable and responsible for any fines issued by the regulatory agencies due to non-compliance or inadequate compliance. BMP’s shall be maintained for the construction duration.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.
B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY UTILITY INSTALLATION

A. General: Install temporary service or connect to existing service.
   1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.

B. Sewers and Drainage: Provide temporary utilities to remove effluent lawfully.
   1. Connect temporary sewers to municipal system as directed by authorities having jurisdiction.

C. Water Service: Install water service and distribution piping in sizes and pressures adequate for construction. Connect temporary water to municipal system as directed by authorities having jurisdiction.

D. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.

E. Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.

F. 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 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.

G. Electric Power Service: Provide temporary electric power service and distribution system of sufficient size, capacity, and power characteristics required for construction operations.
   1. Install electric power service overhead, unless otherwise indicated.

H. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.
   1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.

I. Telephone Service: Provide temporary telephone service in common-use facilities for use by all construction personnel. Install one telephone line for each field office.
   1. Provide additional telephone lines for the following:
      a. Provide a dedicated telephone line for each facsimile machine and computer in each field office.
   2. At each telephone, post a list of important telephone numbers.
      a. Police and fire departments.
b. Ambulance service.
c. Contractor's home office.
d. Architect's office.
e. Engineers' offices.
f. Owner's office.
g. Principal subcontractors' field and home offices.

3. Provide superintendent with cellular telephone or portable two-way radio for use when away from field office.

J. Electronic Communication Service: Provide temporary electronic communication service, including electronic mail, in common-use facilities.

1. Provide high speed internet connection in primary field office.

3.3 SUPPORT FACILITIES INSTALLATION

A. General: Comply with the following:

1. Provide incombustible construction for offices, shops, and sheds located within construction area or within 30 feet of building lines. Comply with NFPA 241.
2. 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.

B. Traffic Controls: Comply with requirements of authorities having jurisdiction.

1. Install traffic control barriers as located on the Maintenance of Traffic plan prepare by the Contractor. Relocate as the completion of each phase.
2. Protect existing site improvements to remain including curbs, pavement, and utilities.
3. Maintain access for fire-fighting equipment and access to fire hydrants.
4. A temporary construction access road shall be clearly marked and used for all deliveries of equipment and materials. Vehicles shall travel at slow speeds (15 mph) when on site.
5. Contractor shall arrange for the delivery of materials and equipment to the place of installation and for the removal of surplus and debris.
6. All construction must be limited to streets specifically noted or discussed in pre-construction. If construction traffic routing through residential neighborhoods is necessary, Contractor shall obtain approval from the local jurisdiction and post signs at each critical intersection to direct traffic to and from the site.

C. Project Identification and Temporary Signs: Provide Project identification and other signs. Install signs where indicated to inform public and individuals seeking entrance to Project. Unauthorized signs are not permitted.

1. Provide temporary, directional signs for construction personnel and visitors.
2. Provide (2) 4’ x 8’ high project signs of ¾” marine grade plywood and wood frame construction or corrugated plastic, painted, to Architect/Engineer's design and colors. Sign shall be mounted on 4” x 4” x 10’ pressure treated posts. Architect shall provide Contractor with signage design at pre-construction conference or as shown on the construction documents.
3. Maintain and touchup signs so they are legible at all times.

D. Waste Disposal Facilities: Comply with requirements specified in Division 1 Section "Construction Waste Management."
3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.

1. Comply with work restrictions specified in Division 1 Section "Summary."
2. Comply with section 02200, City, County, and State FDEP and FDOT regulations.

B. Temporary Erosion and Sedimentation Control: Comply with requirements specified in Division 2 Section "Site Clearing."

C. Stormwater Control: Comply with authorities having jurisdiction. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of Stormwater from heavy rains.

D. Tree and Plant Protection: Comply with requirements specified in Division 2 Section "Tree Protection and Trimming."

E. Pest Control: Engage pest-control service to recommend practices to minimize attraction and harboring of rodents, roaches, and other pests and to perform extermination and control procedures at regular intervals so Project will be free of pests and their residues at Substantial Completion. Obtain extended warranty for Owner. Perform control operations lawfully, using environmentally safe materials.

F. Site Enclosure Fence: Before construction operations begin, furnish and install site enclosure fence in a manner that will prevent people and animals from easily entering site except by entrance gates.

1. Extent of Fence: On all sides containing the full extent of the property to the edge of pavement or public sidewalk. Maintain access to public sidewalk – install warning signs and barricades.

G. 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. Prior to the owner taking full possession, contractor will be fully responsible for replacing any items damaged, destroyed, or removed by vandalism, theft, etc.

H. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting. Protection for work in or adjacent to any right-of-way shall comply with FDOT standards.

I. Temporary Protection: The Contractor shall provide safe access to and from entranceways and/or exits from existing buildings. This may include overhead protection in some areas, with planking or other means when within fenced-in work areas. Also, temporary protection shall be provided at openings through floors or roofs and at edges of slabs in construction areas.

J. The Contractor shall provide necessary weather protection against rain, wind, storms, or heat so as to maintain work, materials and existing building areas free from damage. Cover new work likely to be damaged at the end of each day's work.

K. All contractors shall be responsible for the protection of adjoining areas and materials, including glass, when welding, flame cutting or performing any other operation requiring the use of flame, arcs or sparking devices in the course of the work. Use only flame-proof type tarpaulins.

L. Contractor shall provide and maintain in working order, at least one twenty (20) pound capacity dry chemical type fire extinguisher, suitable for Class A, B or C fires for every 2500sf of new construction / renovation area, or 75 foot on center distance, whichever is greater.
3.5 OPERATION, TERMINATION, AND REMOVAL

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. Maintenance: Maintain facilities in good operating condition until removal.
   1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.

C. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.

D. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
   1. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.
   2. At Substantial Completion, clean and renovate permanent facilities used during construction period. Comply with final cleaning requirements specified in Division I Section "Closeout Procedures."

END OF SECTION 01500
SECTION 01524 - CONSTRUCTION WASTE MANAGEMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for the following:

1. Salvaging nonhazardous construction waste.
2. Recycling nonhazardous construction waste.
3. Disposing of nonhazardous construction waste.

B. Minimum recycling level: Minimum 80% of all demolition and construction debris should be recycled.

C. Related Sections include the following:

1. Division 1 Section "Temporary Facilities and Controls" for environmental-protection measures during construction, and location of waste containers at Project site.

1.3 DEFINITIONS

A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.

B. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.

C. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.

D. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.

E. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

1.4 PERFORMANCE REQUIREMENTS

A. Salvage/Recycle Requirements: When realizable or applicable, the project requirement is to salvage and recycle as much non-hazardous construction waste as possible including the following materials:

1. Construction Waste:
   a. Site-clearing waste.
   b. Masonry and CMU.
c. Lumber.
d. Wood sheet materials.
e. Wood trim.
f. Metals.
g. Roofing.
h. Insulation.
i. Carpet.
j. Gypsum board.
k. Piping.
l. Electrical conduit.
m. Packaging: Regardless of salvage/recycle goal indicated above, salvage or recycle 100 percent of the following uncontaminated packaging materials:

1) Paper.
2) Cardboard.
3) Boxes.
4) Plastic sheet and film.
5) Polystyrene packaging.
7) Plastic pails.

1.5 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Refrigerant Recovery Technician Qualifications: Certified by EPA-approved certification program.

1.6 WASTE MANAGEMENT PLAN

A. General: Develop plan consisting of waste identification, waste reduction work plan, and cost/revenue analysis. Indicate quantities by weight or volume, but use same units of measure throughout waste management plan.

B. Waste Identification: Indicate anticipated types and quantities of site-clearing and construction waste generated by the Work. Include estimated quantities and assumptions for estimates.

C. Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.

1. Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.
2.Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.
3. Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location on Project site where materials separation will be located.

D. Cost/Revenue Analysis: Indicate total cost of waste disposal as if there was no waste management plan and net additional cost or net savings resulting from implementing waste management plan. Include the following:
1. Total quantity of waste.
2. Estimated cost of disposal (cost per unit). Include hauling and tipping fees and cost of collection containers for each type of waste.
3. Total cost of disposal (with no waste management).
4. Revenue from recycled materials.
5. Savings in hauling and tipping fees that are avoided.
6. Handling and transportation costs. Include cost of collection containers for each type of waste.
7. Net additional cost or net savings from waste management plan.

E. Documents: Prepare waste management plan.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 PLAN IMPLEMENTATION

A. General: Implement waste management plan as approved by Architect. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.

1. Comply with Division 1 Section "Temporary Facilities and Controls" for operation, termination, and removal requirements.

B. Waste Management Coordinator: Engage a waste management coordinator to be responsible for implementing, monitoring, and reporting status of waste management work plan. Coordinator shall be present at Project site full time for duration of Project.

C. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work occurring at Project site.

1. Distribute waste management plan to everyone concerned within three days of submittal return.
2. Distribute waste management plan to entities when they first begin work on-site. Review plan procedures and locations established for salvage, recycling, and disposal.

D. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.
2. Comply with Division 1 Section "Temporary Facilities and Controls" for controlling dust and dirt, environmental protection, and noise control.

E. Waste Removal Company: Contractor must use City mandated solid waste and/or recycling company specified in City ordinance, if such ordinance exists. Contractor shall verify with the requirements with the City prior to submitting bid. Solid waste or recycling containers from other than approved companies shall not be brought to site under any circumstances.

3.2 RECYCLING DEMOLITION AND CONSTRUCTION WASTE, GENERAL

A. General: Recycle paper and beverage containers used by on-site workers.
B. Contractor must use the following City mandated solid waste and recycling company as per the City’s franchise agreement:

Waste Pro USA  
3101 NW 16th Terrace, Pompano Beach, FL 33069  
(954) 633-2530

C. Recycling Requirement: A minimum of 80% of all waste generated during construction should be recycled. Contractor shall submit a monthly report documenting compliance.

D. Procedures: If co-mingled recycling hauler is used, this is not a requirement. Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical according to approved construction waste management plan.

1. Provide appropriately marked containers or bins for controlling recyclable waste until they are removed from Project site. Include list of acceptable and unacceptable materials at each container and bin.
   a. Inspect containers and bins for contamination and remove contaminated materials if found.

2. Stockpile processed materials on-site without inter mixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.

3. Stockpile materials away from construction area. Do not store within drip line of remaining trees.

4. Store components off the ground and protect from the weather.

5. Remove recyclable waste off Owner's property and transport to recycling receiver or processor.

3.3 RECYCLING DEMOLITION WASTE

A. Asphaltic Concrete Paving: Grind asphalt to maximum 4-inch size.

1. Crush asphaltic concrete paving and screen to comply with requirements in Division 2 Section "Earthwork" for use as general fill.

B. Asphaltic Concrete Paving: Break up and transport paving to asphalt-recycling facility, which is not suitable for being used as fill.

C. Concrete: Remove reinforcement and other metals from concrete and sort with other metals.

1. Pulverize concrete to maximum 4-inch size, for potential use in sub-base.

2. Crush concrete and screen to comply with requirements in Division 2 Section "Earthwork" for use as satisfactory soil for fill or subbase.

D. Metals: Separate metals by type.

1. Structural Steel: Stack members according to size, type of member, and length.

2. Remove and dispose of bolts, nuts, washers, and other rough hardware.

E. Piping: Reduce piping to straight lengths and store by type and size. Separate supports, hangers, valves, sprinklers, and other components by type and size.

F. Conduit: Reduce conduit to straight lengths and store by type and size.

3.4 RECYCLING CONSTRUCTION WASTE
A. Packaging:

1. Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.
3. Pallets: As much as possible, require deliveries using pallets to remove pallets from Project site. For pallets that remain on-site, break down pallets into component wood pieces and comply with requirements for recycling wood.
4. Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.

B. Site-Clearing Wastes: Chip brush, branches, and trees on-site.

1. Comply with requirements for use of chipped organic waste as organic mulch.

C. Wood Materials:

1. Clean Cut-Offs of Lumber: Grind or chip into small pieces.
2. Clean Sawdust: Bag sawdust that does not contain painted or treated wood.

D. Gypsum Board: Stack large clean pieces on wood pallets and store in a dry location.

1. Clean Gypsum Board: Grind scraps of clean gypsum board using small mobile chipper or hammer mill. Screen out paper after grinding.

3.5 DISPOSAL OF WASTE

A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.

1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

B. Burning: Do not burn waste materials.

C. Disposal: Transport waste materials off Owner's property and legally dispose of them.

END OF SECTION 01524
SECTION 01560 – TEMPORARY BARRIERS AND ENCLOSURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:
   1. Barriers and Barricades
   2. Fencing
   3. Enclosures
   4. General Conditions, Protection and Security
   5. Tree and Plant Protection

B. Related Sections include the following:
   1. Division 1 Section "Summary" Work sequence – Owner occupancy.
   2. Division 1 Section "Project Management and Coordination" Project coordination.
   3. Division 1 Section "Temporary Facilities and Controls" Temporary buildings and other temporary facilities

1.3 SUBMITTALS

A. Tree Surgeon’s Certification: Submit written certification by a qualified tree surgeon that:
   1. Trees and other plant materials indicated to remain have been protected during the course of construction in accordance with recognized standards of the industry.
   2. Indicate that damaged trees or plant materials were promptly and properly treated.
   3. Indicate which damaged trees or other plant materials, if any, are incapable of retaining full growth potential and are recommended to be replaced.

1.4 BARRIERS AND BARRICADES

A. Provide barriers to prevent unauthorized entry to construction areas to allow for Owner's use of site, and to protect adjacent properties from damage from construction operations.
   1. Comply with standards and code requirements for erection of structurally adequate barriers.
   2. Install barriers of a neat and uniform appearance. Surfaces exposed to public view: Paint with colors as selected by the Project Consultant.
3. Provide graphics and warning signs to inform personnel and the public of the hazard being protected against.

4. Where appropriate and needed provide lighting, including flashing red or amber lights.

5. Provide barriers at public rights-of-way and for public access when adjacent to construction operations.

B. Provide barricades with blinking beacon light at all open trenches and other excavations.

C. Provide protection as specified below for plant life designated to remain.

D. Protect non-owned vehicular traffic, stored materials, site and structures from damage.

1.5 FENCING

A. Prior to the Start of Construction Activities: Provide temporary 8 foot high enclosure fencing around construction site; equipped with vehicular and pedestrian gates with locks. Coordinate with Owner’s representative.

B. Construction:

1. Commercial grade chain link fence.
   b. Provide vision screening.


3. Install in a manner that will prevent people, dogs and other animals from easily entering the site, except by the vehicular or pedestrian entrance gates.

C. Location:

1. Locate fencing around all proposed construction areas and as confirmed by the Project Consultant.

2. Locate vehicular entrance gate as indicated on drawings to accommodate convenient, controlled vehicular access to the Contractor’s staging area, temporary facilities, and construction areas.

3. Locate pedestrian entrance gates as required to provide controlled personnel entry in suitable relation to construction parking facilities and Contractor’s temporary offices.

1.6 ENCLOSURES

A. Exterior Enclosures

1. Provide temporary weather tight closure of exterior openings to accommodate acceptable working conditions and protection for Products, to allow for temporary cooling, brief seasonal heating and maintenance of required ambient temperatures identified in individual specification sections, and to prevent entry of unauthorized persons.

2. Provide access doors with self-closing hardware and locks.
B. Interior Enclosures

1. Provide temporary partitions and ceilings to separate work areas from Owner occupied areas, to prevent penetration of dust and moisture into Owner occupied areas, and to prevent damage to existing materials and equipment.

2. Construction:
   a. Temporary Dust Partitions: Where construction operations are adjacent to or within Owner occupied spaces or finished interior work, provide temporary dust partitions constructed of wood or metal framing and plywood sheet materials with closed joints and sealed edges at intersections with existing surfaces.
   b. Duct, Register and Grille Protection: Securely seal air conditioning and ventilation ducts, registers, grilles, outlets and other system components with polyethylene prior to conducting any dust or other contaminant producing construction activities.
   c. See details on Construction Drawing sheets

C. Structural Enclosures:

1. Close openings through floor or roof decks and horizontal surfaces with load bearing wood framed construction or other structural elements necessary to render safe for the loads imposed.

2. Provide temporary roofing as necessary to provide appropriate watertight enclosure and to protect interior spaces and materials.

3. All Temporary partitions shall be erected to withstand 35 MPH winds. Building envelope shall be sealed with structural plywood paneling covering all building openings when wind speed in excess of 35 MPH is anticipated.

1.7 GENERAL CONTROLS, PROTECTION AND SECURITY

A. Dust Control:

1. Execute Work by methods to minimize raising dust from construction operations.

2. Provide positive means to prevent air-borne dust from dispersing into atmosphere.

B. Noise Control:

1. Provide methods, means, and facilities to minimize noise produced by construction operations.

2. Schedule excessively noisy or disruptive operations on off nights, peak hours, and weekends. (Coordinate with owner for schedule)

3. Observe local ordinances limiting noise-generating operations within the neighborhoods adjacent to the area of the Work.

C. Pollution Control:
1. Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations.

2. Do not violate environmentally sensitive lands without proper permits from the Authorities Having Jurisdiction and a written notice to proceed with those particular operations issued by the Owner.

D. Pest Control

1. Provide methods, means, and facilities to prevent pests, insects and rodents from infesting the area of the Work.

2. Retain a local exterminator or pest control company to:
   a. Recommend practices to minimize attraction and harboring of rodents, roaches and other pests.
   b. Provide extermination and control procedures at regular intervals so the Project will be relatively free of pests and their residues at Substantial Completion.
   c. Ensure that pest, insect and rodent control operations are conducted in a lawful manner using environmentally safe materials.

E. Protect Work, and existing facilities, and Owner's operations from unauthorized entry, vandalism, or theft.

F. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.

1. Comply with work restrictions specified in Division 1 Section "Summary."

G. Interior Protection:

1. Provide barriers in and around all exterior openings and over roof construction to prevent water infiltration of storm water from rains. Work shall be scheduled such that the building interiors are protected from water infiltration at all times. Do not open any new areas of roof or remove and doors or windows if rain is expected within 12 hours. Seal all areas previously opened prior to expected rain event.

2. Windows and Glass Block assemblies up to 10’ x 10’ shall be removed and replaced on the same day. Larger openings shall be completed as soon as possible and open building areas shall be protected from air and water penetration at all times.

3. Doors, frames and overhead doors completed as soon as possible and open building areas shall be protected from air and water penetration at all times. Solid barriers with weather proof membranes shall be installed to prevent security breach.

H. Work Area Enclosure Fence: Before construction operations begin, furnish and install site enclosure fence in a manner that will prevent people and animals from easily entering the construction site except by entrance gates.

1. Extent of Fence: On all sides containing the full extent of work area. Maintain access to public sidewalk – install warning signs and barricades.

2. 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. Prior to the owner taking full possession, contractor will be fully responsible for replacing any items damaged, destroyed, or removed by vandalism, theft, etc.

I. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting. Protection for work in or adjacent to any right-of-way shall comply with FDOT standards.

J. Temporary Protection: The Contractor shall provide safe access to and from entranceways and/or exits from existing buildings. This may include overhead protection in some areas, with planking or other means when within fenced-in work areas. Also, temporary protection shall be provided at openings through floors or roofs and at edges of slabs in construction areas.

K. The Contractor shall provide necessary weather protection against rain, wind, storms, or heat so as to maintain work, materials and existing building areas free from damage. Cover new work likely to be damaged at the end of each day's work.

L. All contractors shall be responsible for the protection of adjoining areas and materials, including glass, when welding, flame cutting or performing any other operation requiring the use of flame, arcs or sparking devices in the course of the work. Use only flameproof type tarpaulins.

M. Where construction is being performed in any area connected to existing facilities, the Contractor shall provide and maintain in working order, at least one twenty (20) pound capacity dry chemical type fire extinguisher, suitable for Class A, B or C fires.

N. Entry Control:
   1. Restrict entrance of persons and vehicles into Project site.
   2. Allow entrance to areas of Work only to authorized persons with proper identification.
   3. Maintain log of workmen and visitors, make available to Owner on request.
   4. Owner will control entrance of persons and vehicles related to Owner's operations.

O. Restrictions:
   1. Do not allow cameras or video recorders within Owner occupied site areas or photographs except by written approval of Owner.

P. Provide all personnel with instruction as to the possible presence of Library personnel in and around the construction site and the precautions necessary to ensure children’s safety while conducting construction operations, operating motor vehicles or equipment, or any other associated activity.

1.8 TREE AND PLANT PROTECTION AND TRIMMING

A. Submittals
   1. Tree Pruning Schedule: Written schedule from arborist detailing scope and extent of pruning of trees to remain that interfere with or are affected by construction.
   2. Qualification Data: For tree service firm and arborist.
3. Maintenance Recommendations: From arborist, for care and protection of trees affected by construction during and after completing the Work.

B. Tree Service Firm Qualifications: An experienced tree service firm that has successfully completed tree protection and trimming work similar to that required for this Project and that will assign an experienced, qualified arborist to Project site during execution of tree protection and trimming.

C. Tree Pruning Standard: Comply with ANSI A300 (Part 1), "Tree, Shrub, and Other Woody Plant Maintenance--Standard Practices (Pruning)."

D. Temporary protection:
   1. Install temporary fencing around tree protection zones to protect remaining trees and vegetation from construction damage. Maintain temporary fence and remove when construction is complete.
      a. Install chain-link fence according to ASTM F 567 and manufacturer's written instructions.
   2. Protect tree root systems from damage caused by runoff or spillage of noxious materials while mixing, placing, or storing construction materials. Protect root systems from ponding, eroding, or excessive wetting caused by dewatering operations.
   3. Do not store construction materials, debris, or excavated material inside tree protection zones. Do not permit vehicles or foot traffic within tree protection zones; prevent soil compaction over root systems.
   4. Maintain tree protection zones free of weeds and trash.
   5. Do not allow fires within tree protection zones.

E. Tree Pruning:
   1. Prune trees to remain that are affected by temporary and permanent construction.
   2. Prune trees to remain to compensate for root loss caused by damaging or cutting root system. Provide subsequent maintenance during Contract period as recommended by arborist.
   3. Pruning Standards: Prune trees according to ANSI A300 (Part 1) as follows:
      a. Type of Pruning: Cleaning, Thinning, and Raising.
   4. Cut branches with sharp pruning instruments; do not break or chop.
   5. Chip removed tree branches and dispose of off-site.

F. Tree repair and replacement
   1. Promptly repair trees damaged by construction operations within 24 hours. Treat damaged trunks, limbs, and roots according to arborist's written instructions.
2. Remove and replace trees indicated to remain that die or are damaged during construction operations that Architect and City or County inspector determines are incapable of restoring to normal growth pattern.
   a. Provide new trees of same size and species as those being replaced; plant and maintain as specified.

3. Aerate surface soil, compacted during construction, 10 feet beyond drip line and no closer than 36 inches to tree trunk. Drill 2-inch diameter holes a minimum of 12 inches deep at 24 inches o.c. Backfill holes with an equal mix of augered soil and sand.

G. Disposal of waste materials
   1. Burning is not permitted.
   2. Disposal: Remove excess excavated material and displaced trees from Owner's property

PART 2 - PRODUCTS

2.1 PRODUCT REQUIREMENTS

A. General:
   1. Provide new materials; if acceptable to the Project Consultant, undamaged previously used materials in serviceable condition may be used.
   2. Provide materials suitable for the use intended.

B. Barriers and Exterior Enclosures:
   1. Lumber and Plywood: Comply with requirements in applicable Division 6 specification sections.
      a. For exterior fences and vision barriers, provide exterior type, minimum 3/8" thick plywood.
      b. For safety barriers, sidewalk bridges and similar uses provide minimum 5/8" 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, or other roofing materials approved by the Project Consultant on roofs of job built temporary enclosures.
   3. Paint: Comply with general painting requirements of Division 9:
      a. For job built 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.

C. Barricades: Standard metal folding barricades with reflective finishes. Provide with or without battery powered flashing lights as appropriate for hazard.

D. Fencing:
1. **Galvanized Fabric:** #9 wire (0.148 inch) in diameter, 2 inch mesh fabric with top selvages knuckled.

2. **6-gage minimum bottom tension wire attached to fence fabric with hog rings at 24 inches on center.**

3. **Posts, top rails, braces, and gate frames:** Schedule 40 galvanized pipe as per ASTM A 120 or SS40 Tube pipe. Finish all rails and posts to match fence fabric.

4. **Gate Frames:** As per C.L.F.M.I. requirements with welded connections.

5. **Fabric Connections:**
   a. Securely fasten fabric to all terminal posts with 3/16 inch by 3/4 inch tension bars and bevelled edge 11-gage tension bands.
   b. Number of tension bands: one band less than the height of the fabric in feet for each tension bar.
   c. Fasten all fabric to intermediate posts with 9-gage galvanized wires not to exceed 14 inches apart.
   d. Tie fabric to top rail with 9-gage galvanized wire not to exceed 24 inches apart.
   e. Fasten bottom edge of fabric to bottom tension wire using hog rings at intervals not to exceed 24 inches on center.
   f. Intermediate Post Tops: Malleable iron.
   g. Hinges: Malleable Iron, hot dipped galvanized
   h. Latches: Malleable Iron, hot dipped galvanized.
   i. Hardware required for wide vehicular access gates: Adequately strong swinging or rolling hardware apparatus at Contractor’s option.

E. **Separation Partitions:**

1. **Wood Framing:** Comply with product and installation requirements of Division 6.

2. **Metal Framing:** Comply with product and installation requirements of Division 5.

3. **Insulation:** Provide glass fiber batt rigid insulation.

4. **Gypsum Wallboard:** Comply with product and installation requirements of Division 9.

5. **Paint:**
   a. Provide two coats interior latex semi-gloss wall paint.
   b. Color as selected by Project Consultant.
   c. Comply with product and installation requirements of Division 9.

F. **Temporary Dust Partitions:** Where construction operations are adjacent to or within Owner occupied spaces, provide temporary dust partitions constructed of wood or metal framing and reinforced plywood sheet materials with closed joints and sealed edges at intersections with existing surfaces.

1. **Wood Framing:** Comply with product and installation requirements of Division 6.

2. **Metal Framing:** Comply with product and installation requirements of Division 5.

3. **Sheeting:** Provide plywood sheeting attached securely to wood or metal framing so as to avoid tears, leaks, or openings.
G. Tree and Plant Protection:

1. Tree pruning compound: Waterproof, antiseptic, elastic and free of kerosene, coal tar, creosote, and other substances harmful to plants.

2. Drainage fill: selected stone or gravel graded to pass a three-inch sieve and retained on a one-inch sieve.

3. Wood fencing:
   a. Posts: 4 inch x 4 inch pressure treated wood.
   b. Rails: 2 inch x 4 inch pressure treated wood.
   c. Exposed height above grade: 6 feet - 0 inches.

PART 3 - EXECUTION

3.1 BARRIERS, BARRICADES AND ENCLOSURES

A. Install temporary items under provisions specified above or, where not specified, to level of quality suitable for the intended purpose as judged by the Project Consultant.

3.2 PROTECTION OF TREES AND PLANT MATERIALS

A. Preparation:

1. Verify that existing plant life and features designated to remain are tagged or identified.

2. Identify branches and roots that may interfere with construction.

B. Continuous Protection of Trees and Plants:

1. Protect existing trees scheduled to remain against injury or damage, including cutting, breaking, or skinning of roots, trunks or branches; smothering by stockpiled construction materials, excavated materials or vehicular traffic within branch spread.

2. Protect designated trees with a temporary orange high-density polyethylene safety fence, 4'Ht. Fastened to top, bottom and center with galvanized steel wire.
   a. Unless approved by the owner, the barrier shall be placed at the drip line of the tree.
   b. Increase enclosure size as directed for large trees.

3. Erect temporary fencing before commencing site preparation work.

4. Maintain fencing during full construction period.

C. Root System Protection:

1. Do not store construction materials, debris, or excavated material within the drip line, which is the outer perimeter of branches.
2. Do not permit vehicles within the drip line. Restrict foot traffic to prevent excessive compaction of soil over root systems.

3. Protect tree root systems from damage due to noxious materials in solution caused by run-off or spillage during mixing and placement of construction materials or drainage from stored materials.

4. Protect root systems from flooding, erosion, continuous running water or excessive wetting resulting from dewatering operations.

D. Repair And Replacement Of Trees:

1. Repair trees damaged by construction operations. Make repairs promptly after damage occurs to prevent progressive deterioration of damaged trees.

2. Remove and replace dead and damaged trees, which are determined by the tree surgeon to be incapable of restoration to normal growth pattern.

3. Provide new trees of same size and species as those replaced, up to 6 inch caliper. For replacement of trees over 6 inches in caliper taken 12 inches above grade, provide new trees of 6 inch caliper, and of the same species as selected by the Project Consultant.

4. Repair and replacement of trees scheduled to remain and damaged by construction operations or lack of adequate protection during construction operations shall be at Contractor's expense.

5. Contractor shall process any permits required by the governing agencies to maintain and repair trees.

3.3 REMOVAL OF TEMPORARY BARRIERS, ENCLOSURES AND PROTECTIONS

A. Remove temporary barriers, barricades, fencing, enclosures and protections as warranted by the progress of the Work and prior to Substantial Completion.

B. Remove underground installations to a minimum depth of 2 feet. Grade site as indicated.

C. Clean and repair damage caused by installation or use of temporary work.

D. Restore existing facilities used during construction to original condition or as specified elsewhere in the Contract Documents.

END OF SECTION 01560
PART 1 - GENERAL

1.1 RELATED DOCUMENTS
A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 REQUIREMENTS INCLUDED
A. Contractor shall enforce daily cleaning during progress of Work and enforce final cleanup prior to Substantial Completion.
   1. Hazards Control:
      a. Store volatile wastes in covered metal containers outside the building.
      b. Remove containers from premises daily.
      c. Prevent accumulation of wastes that create hazardous conditions.
      d. Make sure there is adequate ventilation during use of volatile or noxious substances.
B. Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws:
   1. Do not burn or bury rubbish or waste materials on Project Site.
   2. Do not dispose of volatile wastes, such as mineral spirits, oil, or paint thinner in storm or sanitary drains.
   3. Transport waste materials and debris across airport property in covered trucks.

PART 2 - PRODUCTS

2.1 MATERIALS
A. Use cleaning materials recommended by manufacturer or surface to be cleaned which will not create hazards to health or property and which will not damage surfaces.
B. Use green cleaning products and procedures.

PART 3 - EXECUTION

3.1 CLEANING DURING CONSTRUCTION
A. Enforce cleaning to keep building, grounds, and public properties free of accumulation of waste materials, rubbish, and windblown debris resulting from construction operations.
B. Have protective covering applied on newly installed Work where reasonable required to ensure freedom from damage or deterioration at time of Substantial Completion. Enforce cleaning and maintenance on other newly installed Work as frequently as necessary through remainder of construction period.
C. Have operable components adjusted and lubricated to ensure operability without damaging effects.
D. Furnish on-site containers for collection of waste materials, debris, and rubbish.
E. Remove waste material, debris, and rubbish from Site daily.

F. Do not drop or throw materials from heights.

G. Continue enforcing cleaning daily until site is ready for occupancy.

3.2 DUST CONTROL

A. Wet down materials and rubbish to prevent blowing dust on a regular basis.

B. Schedule cleaning operations so that dust and other contaminants resulting from cleaning process will not fall on wet, newly painted surfaces.

3.3 FINAL CLEANING

A. Provide final cleaning of the Work at time indicated, consisting of cleaning each surface or unit of Work to “clean” condition expected for a first-class building and maintenance program. Comply with manufacturer’s instructions for cleaning operations. The following are examples, but not by way of limitation, of cleaning levels required:
   1. Remove labels which are not required as permanent labels.
   2. Clean exposed exterior hard-surfaced finishes, to dirt-free condition, free of dust, stains, films, and similar noticeable distracting substances.
   3. Restore reflective surface to original reflective condition.
   4. Remove debris and surface dust from limited access spaces including roofs, plenums, shafts, trenches, equipment vaults, manholes, and similar spaces.
   6. Clean light fixtures and lamps to function with full efficiency.
   7. Clean Project Site, including landscape development areas, of litter and foreign substances.
   8. Sweep paved areas to broom-clean condition: remove stains, petro-chemical spills, and other foreign deposits.
   9. Rake grounds that are neither planted nor paved, to smooth, even-textured surface.

B. Remove waste materials from Site daily and dispose of in a lawful manner.

C. Removal of protection:
   1. Remove temporary protection devices and facilities that were installed during course of the Work to protect previous completed Work during remainder of construction period.

END OF SECTION 01561
SECTION 01600 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

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

B. Related Sections include the following:

1. Division 1 Section "Closeout Procedures" for submitting warranties for Contract closeout.
2. Divisions 2 through 17 Sections for specific requirements for warranties on products and installations specified to be warranted.

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, except that products consisting of recycled-content materials are allowed, unless explicitly stated otherwise. Products salvaged or recycled from other projects are not considered new products.
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 Contractor.

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.

1.4 SUBMITTALS
A. Product List: Submit a list, in tabular form, showing specified products. Include generic names of products required. Include manufacturer's name and proprietary product names for each product.

1. Coordinate product list with Contractor's Construction Schedule and the Submittals Schedule.
2. Form: Tabulate information for each product under the following column headings:
   a. Specification Section number and title.
   b. Generic name used in the Contract Documents.
   c. Proprietary name, model number, and similar designations.
   d. Manufacturer's name and address.
   e. Supplier's name and address.
   f. Installer's name and address.
   g. Projected delivery date or time span of delivery period.
   h. Identification of items that require early submittal approval for scheduled delivery date.

3. Initial Submittal: Within 15 days after date of commencement of the Work, submit 6 copies of initial product list. Include a written explanation for omissions of data and for variations from Contract requirements.
   a. At Contractor's option, initial submittal may be limited to product selections and designations that must be established early in Contract period.

4. Completed List: Within 30 days after date of commencement of the Work, submit 3 copies of completed product list. Include a written explanation for omissions of data and for variations from Contract requirements.
5. Architect's Action: Architect will respond in writing to Contractor within 15 days of receipt of completed product list. Architect's response will include a list of unacceptable product selections and a brief explanation of reasons for this action. Architect's response, or lack of response, does not constitute a waiver of requirement to comply with the Contract Documents.

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

1. Substitution Request Form: Use CSI Form 13.1A.
2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
   a. Statement indicating why specified material or product cannot be provided.
   b. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate contractors, that will be necessary to accommodate proposed substitution.
   c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
   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. Research/evaluation reports evidencing compliance with building code in effect for Project, from a model code organization acceptable to authorities having jurisdiction.
   i. Detailed comparison of Contractor's Construction Schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If
specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating lack of availability or delays in delivery.
j. Cost information, including a proposal of change, if any, in the Contract Sum.
k. Contractor's certification that proposed substitution complies with requirements in the Contract Documents and is appropriate for applications indicated.
l. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.

3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within 7 days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or 7 days of receipt of additional information or documentation, whichever is later.
   a. Form of Acceptance: Change Order.
   b. Use product specified if Architect cannot make a decision on use of a proposed substitution within time allocated.

C. Comparable Product Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
   1. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within one week of receipt of a comparable product request. Architect will notify Contractor of approval or rejection of proposed comparable product request within 15 days of receipt of request, or 7 days of receipt of additional information or documentation, whichever is later.
      a. Form of Approval: As specified in Division 1 Section "Submittal Procedures."
      b. Use product specified if Architect cannot make a decision on use of a comparable product request within time allocated.

D. 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 Contractor is given option of selecting between two or more products for use on Project, product selected shall be compatible with products previously selected, even if previously selected products were also options.

1.6 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.

B. Delivery and Handling:
   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.

C. Storage:

1. Store products to allow for inspection and measurement of quantity or counting of units.
2. Store materials in a manner that will not endanger Project structure.
3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
4. Store cementitious products and materials on elevated platforms.
5. Store foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
6. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
7. Protect stored products from damage and liquids from freezing.
8. Provide a secure location and enclosure at Project site for storage of materials and equipment by Owner's construction forces. Coordinate location with Owner.

1.7 PRODUCT WARRANTIES

A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

1. Manufacturer's Warranty: Preprinted written warranty published by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
2. Special Warranty: Written warranty required by or incorporated into the Contract Documents, either to extend time limit provided by manufacturer's warranty or to provide more rights for Owner.

B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution. Submit a draft for approval before final execution.

1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
2. Refer to Divisions 2 through 17 Sections for specific content requirements and particular requirements for submitting special warranties.

C. Submittal Time: Comply with requirements in Division 1 Section "Closeout Procedures."

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

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


7. Or Equal: Where products are specified by name and accompanied by the term "or equal" or "or approved equal" or "or approved," comply with provisions in Part 2 "Comparable Products" Article to obtain approval for use of an unnamed product.

B. Product Selection Procedures:

1. Product: Where Specifications name a single product and manufacturer, provide the named product that complies with requirements.

2. Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements.

3. Products: Where Specifications include a list of names of both products and manufacturers, provide one of the products listed that complies with requirements.

4. Manufacturers: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements.

5. Available Products: Where Specifications include a list of names of both products and manufacturers, provide one of the products listed, or an unnamed product, that complies with requirements. Comply with provisions in Part 2 "Comparable Products" Article for consideration of an unnamed product.

6. Available Manufacturers: Where Specifications include a list of manufacturers, provide a product by one of the manufacturers listed, or an unnamed manufacturer, that complies with requirements. Comply with provisions in Part 2 "Comparable Products" Article for consideration of an unnamed product.

7. Product Options: Where Specifications indicate that sizes, profiles, and dimensional requirements on Drawings are based on a specific product or system, provide the specified product or system. Comply with provisions in Part 2 "Product Substitutions" Article for consideration of an unnamed product or system.

8. Basis-of-Design Product: Where Specifications name a product and include a list of manufacturers, provide the specified product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with provisions in Part 2 "Comparable Products" Article for consideration of an unnamed product by the other named manufacturers.

2.2 PRODUCT SUBSTITUTIONS

A. Timing: Requests for substitution during the bid period Only. Complete request for substitution submittals shall be received by the Architect no less than 10 days prior to scheduled bid opening. Requests received after that time may be considered or rejected at discretion of Architect.

B. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
1. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
2. Requested substitution does not require extensive revisions to the Contract Documents.
3. Requested substitution is consistent with the Contract Documents and will produce indicated results.
4. Substitution request is fully documented and properly submitted.
5. Requested substitution will not adversely affect Contractor's Construction Schedule.
6. Requested substitution has received necessary approvals of authorities having jurisdiction.
7. Requested substitution is compatible with other portions of the Work.
8. Requested substitution has been coordinated with other portions of the Work.
9. Requested substitution provides specified warranty.

2.3 COMPARABLE PRODUCTS

A. Conditions: Architect will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:

1. Evidence that the proposed product does not require extensive revisions to the Contract Documents, that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
3. Evidence that proposed product provides specified warranty.
4. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
5. Samples, if requested.

PART 3 - EXECUTION (Not Used)

END OF SECTION 01600
SECTION 01700 - EXECUTION AND HURRICANE PROTECTION REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes general procedural requirements governing execution of the Work including, but not limited to, the following:

2. Field measurements and surveying if required.
4. Progress cleaning.
5. Checking and adjusting.
6. Protection of installed construction.
7. Correction of the Work.
8. Hurricane, Flood, and Other Perils Protection

B. Related Sections include the following:

1. Division 1 Section "Project Management and Coordination" for procedures for coordinating field engineering with other construction activities.
2. Division 1 Section "Submittal Procedures" for submitting surveys.
3. 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 NOT USED

1.4 NOT USED

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

A. 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. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:
   a. Description of the Work.
   b. List of detrimental conditions, including substrates.
   c. List of unacceptable installation tolerances.
   d. Recommended corrections.

2. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.

3. Examine surfaces, floors, and roofs for suitable conditions where products and systems are to be installed.

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. 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.

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


3.3 NOT USED

3.4 NOT USED

3.5 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. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.

F. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.

G. 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.
3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

H. 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.

I. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.6 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.
2. Do not hold materials more than 7 days during normal weather or 3 days if the temperature is expected to rise above 80 deg F.
3. 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: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
1. Remove liquid spills promptly.
2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.

D. 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.

E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.

F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
G. Waste Disposal: Burying or burning waste materials on-site will not be permitted. Washing waste materials down sewers or into waterways will not be permitted.

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 at Substantial Completion.

I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

J. 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.

3.7 CHECKING AND ADJUSTING

A. Check equipment and installed components to confirm proper operation. Remove damaged units, replace with new units, and recheck.

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.

D. Manufacturer's Field Service: If a factory-authorized service representative is required to inspect field-assembled components and equipment installation, comply with qualification requirements in Division 1 Section "Quality Requirements."

3.8 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 manufacturer's written instructions for temperature and relative humidity.

3.9 CORRECTION OF THE WORK

A. Repair or remove and replace defective construction. Restore damaged substrates and finishes.  
   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 pieces or reflective surfaces.
3.10 HURRICANE, FLOOD, AND OTHER PERILS PROTECTION

A. In the event the National Weather Service issues a Hurricane or Flood watch:
   1. Contractor shall cease all regularly scheduled construction activities.
   2. Contractor shall take immediate action to secure the building and the site.
   3. Secure all loose materials, supplies, debris, equipment, etc.
   4. All openings in the building exterior shall be boarded up with minimum ¾” plywood, 2 x 4 lumber, and tap-cons.
   5. Any construction material or equipment that has been delivered to the site with the intent of being used for the project shall be secured within the building or within a sealed metal shipping container placed above the 100-year flood elevation.
   6. Tie down all trailers, storage sheds, etc. with tie down cables secured to ground anchors.
   7. Contractor shall make arrangements to secure pumps, dehumidifying equipment, generator, and gasoline / diesel prior to the storm in the event those items are needed for clean-up.
   8. Contractor shall prepare a project damage assessment report no later than 72 hours after the storm conditions have ceased. A copy of the report shall be sent to the owner, the architect and the insurance company providing builder’s risk / wind storm coverage.
   9. Contractor shall prepare an updated project schedule no later than 7 days after the storm conditions have ceased. Highlight any delays to the project specifically caused by the storm event. Consideration shall be made for availability or shortage of labor, material supplies, equipment, and any delays in shipments.

END OF SECTION 01700
SECTION 01760 – PROTECTION OF INSTALLED CONSTRUCTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

B. Related Sections include the following:
   1. Division 1 Section "Temporary Facilities and Controls"
   2. Division 1 Section "Construction Cleaning"

1.2 GENERAL REQUIREMENTS

A. Cleaning And Protection:
   1. During handling and installation, clean and protect construction in progress and adjoining materials in place.
   2. Apply protective covering where required to ensure protection from damage or deterioration until job completion.
   3. Clean and maintain completed construction as frequently as necessary through the remainder of the construction period under provisions of Division 1 Section "Construction Cleaning".
   4. Adjust and maintain components to ensure proper functioning condition without damaging effects.

B. Limiting Exposures:
   1. Take precautions and supervise construction activities to ensure that no part of the construction in progress or completed are subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.
   2. Where applicable, such exposures include, but are not limited to, the following construction related elements:
      a. Excessive static or dynamic loading.
      b. Excessive internal or external pressures.
      c. Excessively high or low temperatures.
      d. Thermal shock.
      e. Excessively high humidity.
      f. Air contamination or pollution.
      g. Water.
      h. Solvents.
      i. Chemicals.
      j. Light.
      k. Radiation.
      l. Puncture.
      m. Abrasion.
      n. Heavy traffic.
      o. Soiling, staining and corrosion.
      p. Bacteria.
      q. Rodent and insect infestation.
      r. Combustion.
      s. Electrical current.
      t. High speed operation.
      u. Improper lubrication.
v. Unusual wear or other misuse.
w. Contact between incompatible materials.
x. Destructive testing.
y. Misalignment.
z. Excessive weathering.
aa. Unprotected storage.
bb. Improper shipping or handling.
cc. Theft.
dd. Vandalism.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 PREPARATION

A. Cover, protect finished or existing building surfaces (walls, floors, ceilings, etc.), furniture, equipment and fixtures to remain from soiling or damage when selective demolition work and other construction activities are performed, which contain new elements of construction.

B. Erect; maintain dust-proof partitions and other closures as required to prevent spread of dust or fumes to portions of the building containing new construction work.

3.2 PROTECTION OF INSTALLED WORK

A. Protect installed Work and provide special protection where specified in respective Sections of Divisions 2 through 16.

B. Protect all stored products with plastic wrap.

C. Provide temporary and removable protection for installed products.

D. Control traffic in immediate area of installed Work to minimize damage.

E. Provide protective coverings at walls, ceilings, projections, jambs, sills, and soffits of openings as required.

F. If required, protect finished floors, stairs and other finished surfaces with durable sheet materials to protect from traffic, dirt, wear, damage, or movement of heavy objects.

G. Prohibit traffic and storage on waterproofed or roofed surfaces. If traffic or activity on such surfaces is necessary, obtain recommendation from waterproofing or roofing manufacturer and provide protection accordingly.

H. Do not allow wheeled or tracked vehicles on surfaces or areas not designed for their support or which will be otherwise damaged.

END OF SECTION 01760
SECTION 01770 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 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. Inspection procedures.
2. Maintenance Materials
3. Warranties.
4. Final cleaning.

B. Related Sections include the following:

1. Division 1 Section "Photographic Documentation" for submitting Final Completion construction photographs and negatives.
2. Division 1 Section "Execution Requirements" 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. Divisions 2 through 16 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, when applicable, 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.
   a. Contractor shall be responsible for meeting all construction and paper work requirements to obtain such approval within the timeframe stipulated in the contract. Failure on the part of the contractor to secure timely approval will result in assessment of liquidation damages owed to the owner for any resulting delays.
5. Prepare and submit (3) copies, in 3 ring binders, of the Project Record Documents including all shop drawings provided during construction, all material and product submittals, operation and
maintenance manuals, Final Completion construction photographs, property surveys, and similar final record information.

6. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.

7. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.

8. Complete startup testing of systems.


10. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.

11. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.

12. Complete final cleaning requirements, including touchup painting.

13. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

B. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.

1. Re-inspection: Request re-inspection 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.

1.4 FINAL COMPLETION

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

1. Submit copy of the Certificate of Occupancy or Certificate of Completion issued by the Building Department. Architect shall not provide a Final Completion letter without a Building Department Certificate of Occupancy or Certificate of Completion.

2. Submit a final Application for Payment according to Division 1 Section "Payment Procedures."

3. 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.

4. Submit evidence of final, continuing insurance coverage complying with insurance requirements.

5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training videotapes.

B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Architect 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. Re-inspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

2. If more than one final completion inspection is required, the Contractor will be responsible for paying the Architect for all additional inspections and punch list preparation required by the architect to verify compliance. Final payment application will not be processed until all items have been completed, closeout documentation completed, and re-inspection fees paid.

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. Use CSI Form 14.1A.

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.
   d. Name of Contractor.
   e. Page number.

1.6 MAINTENANCE MATERIALS

A. Submit maintenance materials, equipment and accessories of the types and in the quantities specified within the respective specification Sections of Divisions 2 through 17.

B. Provide maintenance materials, equipment and accessories in original manufacturer’s packaging with manufacturer’s original, clearly legible labeling.

C. Coordinate delivery date and final storage location of maintenance materials, equipment and accessories to the Owner through the Project Consultant prior to requesting Substantial Completion Inspection.

D. Do not utilize maintenance materials or equipment for cleaning, maintenance or other Contractor operations.

E. Test and inspect maintenance materials, equipment and accessories to ensure operability, fitness for purpose and new condition prior to submitting to the Owner.

1.7 WARRANTIES

A. 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.

B. 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.

C. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.

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

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 all the following cleaning operations that apply to this project before requesting inspection for certification of Substantial Completion:

   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 Project site.
   e. 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.
   f. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
   g. Sweep concrete floors broom clean in unoccupied spaces.
   h. 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.
   i. Remove labels that are not permanent.
   j. 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.
k. Wipe surfaces of mechanical and electrical equipment, elevator equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
l. Replace parts subject to unusual operating conditions.
m. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
n. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
o. Clean ducts, blowers, and coils if units were operated without filters during construction.
p. 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.
q. Leave Project clean and ready for occupancy.

C. 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.

END OF SECTION 01770
SECTION 01780 – CLOSEOUT SUBMITTALS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and
   other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for closeout submittals, including the
   following:
   1. Operation and Maintenance Data
   2. Maintenance Materials
   3. Product Warranties
   4. Product Bonds
   5. Project Record Documents
   6. Spare Parts
   7. Electronic Media
   8. Miscellaneous Schedules

B. Related Sections include the following:
   1. Division 1 Section "Submittal Procedures"
   2. Division 1 Section "Closeout Procedures"
   3. Division 1 Section "Project Record Documents"
   4. Division 1 Section "Operation And Maintenance Data"

1.3 SUBMITTALS

A. Project closeout submittals required by the Construction Documents for the Work, or a portion thereof,
   shall be submitted by the Contractor at or prior to the time of his request for the Architect's inspection
   unless otherwise specified in this Section or elsewhere in the Construction Documents.

B. Architect (assisted by the City’s Staff and other Consultants as applicable) will review project closeout
   submittals with the City for content, accuracy, and format:
   1. If the Architect disapproves or rejects any project closeout submittal, it shall be returned to the
      Contractor for correction and modification.
   2. The Contractor shall then submit his revised and corrected project closeout submittals to the
      Architect for review and approval.
   3. The Contractor shall continue to revise and resubmit project closeout submittals until all required
      submittals have been accepted by the Project Consultant.
   4. The Architect will forward approved project closeout submittals to the City prior to the City's
      Substantial Completion Inspection.
   5. Corrections or modifications of Project Closeout Submittals shall not be used as justification for
      an extension of Time.

C. Submit closeout submittals under provisions of Division 1 Section "Submittal Procedures", with content
   and in formats specified within this Section and elsewhere in the Construction Documents
1.4 OPERATION AND MAINTENANCE DATA

A. Quality Assurance:
   1. Prepare instructions and data by personnel experienced in maintenance and operation of described products.

B. Organization: Unless otherwise indicated, organize each manual into separate sections. Each manual shall contain the following materials, in the order listed:
   1. Title page.
   2. Table of contents.

C. 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 City.
   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.

D. Format:
   1. Prepare data in the form of an instructional manual.
   2. Bind in commercial quality 8-1/2 inch x 11 inch three D side ring binders with durable plastic covers, 3 inch maximum ring size:
      a. When multiple binders are used, correlate data into related consistent groupings.
      b. Provide sheet lifters for front and back of binder.
      c. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of Project; identify subject matter of contents.
      d. Index Tab Dividers:
         1) Provide tabbed dividers for each separate product and system, with typed description of product and major component parts of equipment.
         2) Provide index tab sheet identified as “Contents” in front of the first page of the table of contents to prevent laser printer or copier toner from sticking to vinyl binder.
   3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software diskettes for computerized electronic equipment.
   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. Provide Photo reduced 11” x 17” copies folded in half of the as-built record drawings.
      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.

E. Contents, Each Volume:
   1. Table of Contents: Provide title of Project; names, addresses, and telephone numbers of Project Consultant, Sub-Consultants, and Contractor with name of responsible parties; schedule of products and systems, indexed to content of the volume.
      a. If record documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.
   2. For Each Product or System: List names, addresses and telephone numbers of SubContractors and suppliers, including local source of supplies and replacement parts and applicable local maintenance Contractors.
3. **Product Data:** Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.

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

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

6. **Warranties:** Bind in copy of each.

**F. Manual For Materials and Finishes:**

1. **Building Products, Applied Materials, and Finishes:** Include product data, with catalog number, size, composition, and color and texture designations. Provide information for re-ordering custom manufactured Products.

2. **Instructions for Care and Maintenance:** Include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

3. **Moisture Protection and Weather Exposed Products:** Include product data listing applicable reference standards, chemical composition, and details of installation. Provide recommendations for inspections, maintenance, and repair.

4. **Additional Requirements:** As specified in individual Product specification sections.

5. Provide a listing in Table of Contents for design data, with tabbed fly sheet and space for insertion of data.

**G. Manual for Equipment and Systems:**

1. **Each Item of Equipment and Each System:** Include description of unit or system, and component parts. Identify function, normal operating characteristics, and limiting conditions. Include performance curves, with engineering data and tests, and complete nomenclature and model number of replaceable parts.

2. **Panelboard Circuit Directories:** Provide electrical service characteristics, controls, and communications; typed.

3. **Include color-coded wiring diagrams as installed.**

4. **Operating Procedures:**
   a. Include start-up, break-in, and routine normal operating instructions and sequences.
   b. Include regulation, control, stopping, shutdown, and emergency instructions.
   c. Include summer, winter, and any special operating instructions.

5. **Maintenance Requirements:** Include routine procedures and guide for preventative maintenance and troubleshooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

6. Provide servicing and lubrication schedule, and list of lubricants required.

7. Include manufacturer's printed operation and maintenance instructions.

8. Include sequence of operation by controls manufacturer.

9. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

10. Provide control diagrams by controls manufacturer as installed.

11. Provide Contractor's coordination drawings, with color-coded piping diagrams as installed.

12. Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.

13. Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.

14. **Additional Requirements:** As specified in individual Product specification sections.

15. Provide a listing in Table of Contents for design data, with tabbed dividers and space for insertion of data.

**H. Instruction of City Personnel:**

1.
2. Prepare and insert additional data in Operation and Maintenance Manual when need for such data becomes apparent during instruction.

I. Submittals:
   1. Review Copy:
      a. Submit 1 copy of completed volumes (30) days prior to submitting Contractor's Request for Substantial Completion Inspection.
      b. This copy will be reviewed and returned with comments by the Architect, the City, and other City consulting reviewers as applicable.
      c. Revise content of all document sets as required by comments provided by the Architect and the City prior to final submission.
   2. Final Submittals:
      a. Submit (5) sets of revised final volumes in final form prior to submitting Contractor's Request for Substantial Completion Inspection.
      b. In addition to hard copies, scan and submit (5) sets of the closeout documents on DVD-ROMs in PDF format.

1.5 MAINTENANCE MATERIALS

   A. Submit maintenance materials, equipment and accessories of the types and in the quantities specified within the respective specification Sections of Divisions 2 through 17.

   B. Provide maintenance materials, equipment and accessories in original manufacturer’s packaging with manufacturer’s original, clearly legible labeling.

   C. Coordinate delivery date and final storage location of maintenance materials, equipment and accessories to the City through the Architect prior to submittal of Contractor's Request for Substantial Completion Inspection.

   D. Do not utilize maintenance materials or equipment for cleaning, maintenance or other Contractor operations.

   E. Test and inspect maintenance materials, equipment and accessories to ensure operability, fitness for purpose and new condition prior to submitting to the City.

1.6 PRODUCT WARRANTIES

   A. Summary:
      1. This article specifies general administrative and procedural requirements for warranties required by the Construction Documents, including manufacturers standard warranties on products and special warranties.
         a. Refer to the Construction Documents for terms of the Contractor's special warranty of workmanship and materials.
         b. Specific requirements for warranties for the Work and products and installations that are specified to be warranted, are included in the individual Sections of Divisions 2 through 17.
      2. Disclaimers and Limitations: Manufacturer's exclusions, disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the Work that incorporates the products, nor does it relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with the Contractor.

   B. Definitions:
1. Standard Product Warranties are preprinted written warranties published by individual manufacturers for particular products and are specifically endorsed by the manufacturer to the City.

2. Special Warranties:
   a. Are written warranties required by or incorporated in the Construction Documents, either to extend time limits provided by standard warranties or to provide greater rights for the City.
   b. Refer to individual Sections of Divisions 2 through 17 for specific content requirements, standard form documents, and particular requirements for submittal of special warranties.

C. Warranty Requirements
1. Related Damages and Losses: When correcting warranted Work that has failed, remove and replace other Work that has been damaged as a result of such failure or that must be removed and replaced to provide access for correction of warranted Work.
2. Reinstatement of Warranty: When Work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.
3. Replacement Cost: Upon determination that Work covered by a warranty has failed, replace or rebuild the Work to an acceptable condition complying with requirements of Construction Documents. The Contractor is responsible for the cost of replacing or rebuilding defective Work regardless of whether the City has benefited from use of the Work through a portion of its anticipated useful service life.
4. City's Recourse: Written warranties made to the City are in addition to implied warranties, and shall not limit the duties, obligations, rights and remedies otherwise available under the law, nor shall warranty periods be interpreted as limitations on time in which the City can enforce such other duties, obligations, rights, or remedies.
5. Rejection of Warranties: The City reserves the right to reject warranties and to limit selections to products with warranties not in conflict with requirements of the Design-Build Criteria Package and Construction Documents.
6. The City reserves the right to refuse to accept Work for the Project where a special warranty, certification, or similar commitment is required on such Work or part of the Work, until evidence is presented that entities required to countersign such commitments are willing to do so.

D. Submittals:
1. Draft Copies:
   a. When a warranty document is required to be executed by the Contractor, or the Contractor and a subcontractor, supplier or manufacturer, prepare a written document that contains appropriate terms and identification, ready for execution by the required parties. Submit a draft to the City through the Architect for approval.
   b. For special warranties prepare a written document utilizing the appropriate form, ready for execution by the Contractor, or the Contractor and subcontractor, supplier or manufacturer. Submit a draft to the City through the Architect for approval.
   c. Submit draft copies of all proposed final warranty documents to the Architect under provisions of Division 1 Section "Submittal Procedures", for the City and Architect’s review.
   d. Edit warranty documents to make them project specific for the City.
   e. Remove exclusions, disclaimers and limitations on product warranties not allowed by the Construction Documents.
   f. Include terms and conditions in addition to the “standard” warranty as may be required by the Construction Documents.
   g. Catalog copies or other “sample” warranty forms not presented in project specific format for the City shall be resubmitted.

2. Form of Submittal:
a. Prior to Substantial Completion compile (5) five copies of each required warranty properly executed by the Contractor, or by the Contractor, subcontractor, supplier, or manufacturer.
b. Organize the warranty documents into an orderly sequence based on the table of contents of the Project Manual.
c. Bind in commercial quality 8-1/2 x 11 inch three D side ring binders with durable plastic covers, 3 inch maximum ring size:
   1) Provide sheet lifters for front and back of binder.
   2) Cover: Identify each binder with typed or printed title WARRANTIES with title of Project; name, address and telephone number of Contractor and name of responsible company principal.
   3) Table of Contents:
      a) Neatly typed, in the sequence of the Table of Contents of the Project Manual, with each item identified with the number and title of the specification section in which specified, and the name of Product or work item.
      b) Provide index tab sheet identified as “Contents” in front of the first page of the table of contents to prevent laser printer or copier toner from sticking to vinyl binder.
   4) Separate each warranty with index tab sheets keyed to the Table of Contents listing.
      a) Provide full information, using separate typed sheets as necessary.
      b) List subcontractor / Builder, supplier, and manufacturer, with name, address, and telephone number of responsible principal.
d. When operating and maintenance manuals are required for warranted construction, provide additional copies of each required warranty documents, as necessary, for inclusion in each required manual.

E. Timing of Submittals:
1. Draft warranty documents: Submit with shop drawings, product data or samples as otherwise required for the specified product. If no other submittals are required for a specific product, submit required draft warranty documents in a timely manner prior to delivery and installation of the product on the site.
2. Submit final warranty documents to the Architect not later than (7) days after the date of Substantial Completion for the Work or a portion thereof as established on the Project Consultant’s executed Consultant's Letter Establishing Substantial Completion Date.
3. If the City’s executed Letter Establishing Substantial Completion Date designates a commencement date for warranties other than the date of Substantial Completion for the Work, or a designated portion of the Work, submit written warranties upon request of the City.
4. When a designated portion of the Work is completed and occupied or used by the City, by separate agreement with the Contractor during the construction period, submit properly executed warranties to the Architect within (7) days of completion of that designated portion of the Work.

1.7 PROJECT RECORD DOCUMENTS
A. General Requirements:
1. Do not use record documents for construction purposes.
2. Protect from deterioration and loss in a secure, fire resistive location.
3. Provide access to record documents for reference by the Architect, the City, and other City related personnel during normal working hours.
4. Make project record documents available for inspection by jurisdictional authorities at all times.
5. Ensure special protection of project record documents

B. Maintain at the site for the City one record copy of:
1. Drawings.
2. Specifications.
3. Addenda.
4. Change Orders, Project Consultant’s Supplementary Instructions and other modifications to the
   Contract.
5. Approved submittals including all administrative submittals as may be required in the Project
   Manual.
6. Field Test Records and Reports.
7. Construction Photographs.

C. Maintenance of Project Record Documents:
1. Store documents, samples in Contractor's field office apart from documents used for construction.
   a. Provide fire resistive files and racks for storage of documents.
   b. Provide locked fire resistive cabinets or secure storage spaces for storage of samples.
2. Filing Organization:
   a. File information concerning individual products according to the 1995 edition of
      MasterFormat as published by the Construction Specifications Institute.
   b. File information concerning assemblies and systems according to the CSI/CSC UniFormat
      as published by the Construction Specifications Institute, edition current upon Notice to
      Proceed date.
3. Maintain documents in a clean, dry, legible condition and in good order.

D. Record Drawings:
1. Maintain a clean, undamaged set of blue or black line on white prints of Construction Documents
   and Shop Drawings.
2. Mark the set to show the actual installation where the installation varies substantially from the
   Work as originally shown.
3. Mark whichever drawing is most capable of showing conditions fully and accurately; where Shop
   Drawings are used, record a cross-reference at the corresponding location on the Construction
   Documents.
4. Give particular attention to concealed elements that would be difficult to measure and record at a
   later date.
5. Mark record sets with red erasable pencil; use other colors to distinguish between variations in
   separate categories of the Work.
6. Mark new information that is important to the City, but was not shown on Construction
   Documents or Shop Drawings.
7. Note related Change Order numbers where applicable.
8. Organize record drawing sheets into manageable sets, bind with durable paper cover sheets, and
   print suitable titles, dates and other identification on the cover of each set.
9. 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.
   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.
   j. Changes made by Change Order or Construction Change Directive.
   k. Changes made following Architect's written orders.
   l. Details not on the original Construction Documents.
   m. Field records for variable and concealed conditions.
   n. Record information on the Work that is shown only schematically.

E. Record Specifications:
1. Maintain one complete copy of the Project Manual, including addenda, and one copy of other written construction documents such as Change Orders and modifications issued in printed form during construction.

2. Mark these documents to show substantial variations in actual Work performed in comparison with the text of the Specifications and modifications.

3. Give particular attention to substitutions, selection of options and similar information on elements that are concealed or cannot otherwise be readily discerned later by direct observation.

4. Note related record drawing information and Product Data.

5. Upon completion of the Work, submit record Specifications to the Architect for the City's records.

F. Record Product Data:
1. Maintain one copy of each Product Data submittal. Mark these documents to show significant variations in actual Work performed in comparison with information submitted.
2. Include variations in products delivered to the site, and from the manufacturer's installation instructions and recommendations.
3. Give particular attention to concealed products and portions of the Work which cannot otherwise be readily discerned later by direct observation.
4. Note related Change Orders and markup of record drawings and Specifications.
5. Upon completion of markup, submit complete set of record Product Data to the Architect for the City's records.

G. Record Testing Data / Certifications
1. Record Testing Data / Certifications: Contractor shall submit (5) sets of signed and sealed reports prepared during the course of the construction. Testing Data shall include, but not limited to:
   a. Soils compaction and density.
   b. Concrete cylinder tests.
   c. Structural threshold inspector in-progress inspections.
   d. Structural threshold inspector final structural certifications.
   e. Structural welding certification.
   f. Insulation certification.
   g. As-built site lighting photometric plan.
   h. Mechanical test and balance report.
   i. Surge protection certification.
   j. Flood plain elevation certification.

H. Record Sample Submitted:
1. Immediately prior to the date or dates of Substantial Completion, the Contractor will meet at the site with the Architect and the City's personnel to determine which of the submitted Samples that have been maintained during progress of the Work are to be transmitted to the City for record purposes.
2. Comply with delivery to the City's Sample storage area.

I. Record Cad As-Built Drawings:
1. Update all Electronic Construction Document CAD Drawings for all construction deviations and submit copies of the drawings to the City in native CAD and PDF formats.
   a. All redline markup shown on the field record set shall be incorporated into the electronic files at the end of the construction phase.
   b. Include Civil As-built final survey with site and utility improvements.

J. Miscellaneous Record Submittals:
1. Refer to other Specification Sections for requirements of miscellaneous record keeping and submittals in connection with actual performance of the Work.
2. Immediately prior to the date or dates of Substantial Completion, complete miscellaneous records and place in good order, properly identified and bound or filed, ready for continued use and reference.
3. Submit to the Architect for the City's records.

1.8 SPARE PARTS

A. Submit spare parts and related accessories of the types and in the quantities specified within the respective specification Sections of Divisions 2 through 17.

B. Provide spare parts in original manufacturer’s packaging with manufacturer’s original, clearly legible labeling.

C. Coordinate delivery date and final storage location of spare parts through the Architect prior to submittal of Contractor's Request for Substantial Completion Inspection.

D. Do not utilize spare parts for any purpose during construction.

E. Test and inspect spare parts to ensure operability, fitness for purpose and new condition prior to submitting to the City.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01780
SECTION 01781 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 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. Record Testing Data / Certifications

B. Related Sections include the following:
   1. Division 1 Section "Closeout Procedures" for general closeout procedures.
   2. Division 1 Section "Operation and Maintenance Data" for operation and maintenance manual requirements.

1.3 SUBMITTALS

A. Record Drawings: Comply with the following:
   1. Number of Copies: Submit five (5) sets of marked-up Record Prints.

B. Record Specifications: Submit five (5) sets of Project's Specifications, including addenda and contract modifications.

C. Record Product Data: Submit five (5) sets 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. Record Testing Data: Submit five (5) sets of record testing data, each test and each copy signed and sealed by testing agency or professional engineer.

PART 2 - PRODUCTS

2.1 RECORD DRAWINGS

A. Record Drawings: 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, subcontractor, 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. Overall dimensions of roof layout.
   d. Actual locations of roof equipment and skylights.
   e. Changes made by Change Order or Construction Change Directive.
   f. Changes made following Architect's written orders.
   g. Details not on the original Contract Drawings.
   h. Field records for variable and concealed conditions.
   i. 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 Transparencies: Immediately before inspection for Certificate of Substantial Completion, review marked-up Record Prints with Architect. When authorized, prepare a full set of corrected transparencies of the Contract Drawings and Shop Drawings.

   1. Incorporate changes and additional information previously marked on Record Prints. Erase, redraw, and add details and notations where applicable.
   2. Refer instances of uncertainty to Architect for resolution.
   3. Owner will furnish Contractor one set of transparencies of the Contract Drawings for use in recording information.

C. Newly Prepared Record Drawings: Prepare new Drawings instead of preparing Record Drawings where Architect determines that neither the original Contract Drawings nor Shop Drawings are suitable to show actual installation.

   1. New Drawings may be required when a Change Order is issued as a result of accepting an alternate, substitution, or other modification.
   2. Consult Architect for proper scale and scope of detailing and notations required to record the actual physical installation and its relation to other construction. Integrate newly prepared Record Drawings into Record Drawing sets; comply with procedures for formatting, organizing, copying, binding, and submitting.

D. Format: Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
1. Record Prints: Organize Record Prints and newly prepared Record Drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.

2. Record Transparencies: Organize into unbound sets matching Record Prints. Place transparencies in durable tube-type drawing containers with end caps. Mark end cap of each container with identification. If container does not include a complete set, identify Drawings included.

3. Identification: As follows:
   a. Project name.
   b. Date.
   c. Designation "PROJECT RECORD DRAWINGS."
   d. Name of Architect.
   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 Specifications, 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 RECORD TESTING DATA / CERTIFICATION

A. Record Testing Data / Certifications: Contractor shall submit (2) sets of signed and sealed reports prepared during the course of the construction. Testing Data shall include, but not limited to:
1. Asbestos tests / asbestos free material certifications.
2. Insulation certification.
3. As-built roof plan.
2.5 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.

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 reference during normal working hours.

3.2 RECORD DOCUMENTATION MANUAL

A. Organization: Include a section in the manual for each of the following:
   1. Table of Contents.
   2. Record Drawings.
   3. Record Specifications.
   4. Record Product Data.
   5. Record Testing Data / Certification.
   6. Miscellaneous Record Submittals.

B. Tables of Contents: Include a table of contents for each record manual.

3.3 MANUALS, GENERAL

A. Organization: Unless otherwise indicated, organize each manual into separate sections. Each manual shall contain the following materials, in the order listed:
   1. Title page.
   2. Table of 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 record documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.


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 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, organize data in each binder into groupings by sections.
   b. Identify each binder on front and spine, with printed title "RECORD DOCUMENTATION 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.


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. Provide Photo reduced 11 x 17 copies folded in half of the as-built record drawings.
   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.

END OF SECTION 01781
SECTION 01782 - OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 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, and finishes; systems and equipment.

B. Related Sections include the following:

1. Division 1 Section "Closeout Submittals" 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 2 through 16 Sections for specific operation and maintenance manual requirements for the Work 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 one copy of draft and mark whether general scope and content of manual are acceptable.

B. Final Submittal: Submit five (5) copies of each manual in final form at least 15 days before final inspection.

1. Correct or modify each manual to comply with Architect's comments. Submit 5 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 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.

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 or multiple binders.

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 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.


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.
5. Power failure.
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 when applicable:

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.
7. Seasonal and weekend operating instructions.
8. Required sequences for electric or electronic systems.
9. Special operating instructions and procedures.

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

END OF SECTION 01782
SECTION 01783 – ROOF MAINTENANCE DATA

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for preparing maintenance manuals, including the following:
   1. 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, and finishes; systems and equipment.

B. Related Sections include the following:
   1. Division 1 Section "Closeout Submittals" 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 2 through 16 Sections for specific operation and maintenance manual requirements for the Work 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 manual at least 15 days before requesting inspection for Substantial Completion. Include a complete maintenance directory. Architect will return one copy of draft and mark whether general scope and content of manual are acceptable.

B. Final Submittal: Submit five (5) copies of the manual in final form at least 15 days before final inspection.
   1. Correct or modify manual to comply with Architect's comments. Submit 5 copies of the manual within 15 days of receipt of Architect's comments.
1.5 COORDINATION

A. Where 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 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. 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. Tables of Contents: Include a table of contents for emergency maintenance manual.

D. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem used in the Contract Documents.

2.2 MANUALS, GENERAL

A. Organization: Unless otherwise indicated, organize the manual into a separate section for each system and subsystem. The manual shall contain the following materials, in the order listed:
   1. Title page.
   2. Table of 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.

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 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, and components of one system into a single or multiple binders.
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 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 system.
   b. Identify each binder on front and spine, with printed title "ROOF 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.


4. 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 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 description.
   2. Manufacturer's name.
   3. Color, pattern, and texture.
   5. Reordering information for specially manufactured products.

D. Maintenance Procedures: Include manufacturer's written recommendations and the following:
   1. When to inspect the roof and 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. List of sealants and locations where they need to be applied.
   5. If required, state type of moisture surveys or tests, and frequency each test should be taken.
   6. Schedule for routine application of sealants, cleaning, and maintenance.
   7. 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.

PART 3 - EXECUTION

3.1 MANUAL PREPARATION

A. Maintenance Documentation Directory: Prepare a separate manual that provides an organized reference to other required manuals.

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

C. 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.

D. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts with roof system installation. 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 maintenance manuals.
   2. Comply with requirements of newly prepared Record Drawings in Division 1 Section "Project Record Documents."

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

END OF SECTION 01782
SECTION 02070 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions, Supplemental General Conditions, and other Division 1 Specification Sections, apply to this all sections of specifications.

1.2 SUMMARY

A. This Section includes the following:
   1. Demolition and removal of selected building elements including roofing, flashing, insulation, etc.

1.3 DEFINITIONS

A. Remove: Remove and legally dispose of items except those indicated to be reinstalled, salvaged, or to remain the property.

B. Remove and Salvage: Items indicated to be removed and salvaged remain the property. Remove, clean, and pack or crate items to protect against damage. Identify contents of containers and deliver to designated storage area.

C. Remove and Reinstall: Remove items indicated; clean, service, and otherwise prepare them for reuse; store and protect against damage. Reinstall items in the same locations or in locations indicated.

D. Existing to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by the Owner, items may be removed to a suitable, protected storage location during selective demolition and then cleaned and reinstalled in their original locations.

1.4 MATERIALS OWNERSHIP

A. Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain the property, demolished materials shall become the Contractor’s property and shall be removed from the site with further disposition legally at the Contractor's option.

1.5 SUBMITTALS

A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections, for information only, unless otherwise indicated.

B. Schedule of selective demolition activities indicating the following:
   1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity.
   2. Interruption of utility services.
   3. Coordination for shutoff, capping, and continuation of utility services.
1.6 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with governing EPA notification regulations before starting selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Pre-demolition Conference: Contractor shall schedule a pre-installation conference with City’s Project Manager and Architect.

1.7 PROJECT CONDITIONS

A. This facility is in use every day of the week. The Contractor is required to perform the needed work for his construction effort in a way that does not disturb the function or interrupt ongoing operations. All work must be coordinated and scheduled with approval from the City. The areas not covered by the work must be protected. Any areas damaged or disturbed by the construction effort in any way must be repaired and brought to the condition it was found just prior to the construction. All repairs must be done by the Contractor as part of this contract and to the complete satisfaction of the City.

B. Contractor shall sequence the project in the manner that will allow the owner to use of the building at all times. Contractor shall clean up at the end of each workday and with through cleaning and material / equipment disposal on Fridays in preparation for the weekend.

C. Contractor shall not block any means of egress.

D. Conduct selective demolition so that Owner’s operations will not be disrupted. Provide not less than 10 days advance notice to the Owner of activities that will affect Owner’s operations.

E. Owner and Consultant assume no responsibility for actual condition of elements to be selectively demolished.
   1. Conditions existing at time of inspection for bidding purpose will be maintained by the Owner as far as practical.

F. Asbestos: It is NOT expected that asbestos will be encountered in the Work.
   1. If any asbestos is encountered, Contractor shall hire a certified asbestos abatement contractor to remove all asbestos containing material in accordance with EPA and OSHA regulation.
   2. The asbestos abatement contractor shall supply all labor, material services, insurance, permits and equipment necessary to carry out the work.

G. Protections: Provide temporary barricades and other forms of protection to protect City staff and general public from injury due to selective demolition work.
   1. Provide protective measures as required to provide free and safe passage of the Owner and all vehicles and general public to areas effected by construction.
   2. Protect from damage existing finish work that is to remain in place and becomes exposed during demolition operations.
   3. Protect floors with suitable coverings when necessary.
   4. Provide temporary weather protection during interval between demolition and removal of existing construction on exterior surfaces and installation of new construction to ensure that no water leakage or damage occurs to structure or interior areas of existing structures.
   5. Provide temporary dust and debris barriers of fire resistant materials to control dust and debris and to confine demolition of existing and finished work.
   6. Remove protections at completion of work.

H. Damages: Promptly repair damages caused to adjacent facilities by demolition work.
I. Traffic: Conduct selective demolition operations and debris removal to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities.
   1. Do not close, block, or otherwise obstruct streets, walks, or other occupied or used facilities without approval from the Owner and providing alternate routes around all closed or obstructed traffic ways.

J. Flame Cutting: Do not use cutting torches for removal until work area is cleared of flammable materials. At concealed spaces, such as interior of pipe spaces, verify condition of hidden space before starting flame-cutting operations. Maintain portable fire suppression devices during flame-cutting operations.

K. Explosives:
   1. Use of explosives will not be permitted.

L. Utility Services: Maintain existing utilities indicated to remain in service and protect them against damage during demolition operations.
   1. Do not interrupt utilities serving occupied or used facilities, except when authorized in writing by the Owner. Provide temporary services during interruptions to existing utilities or schedule work to install interrupted utilities first, as acceptable to the Owner.
   2. Maintain fire protection services during selective demolition operations.

M. Environmental Controls: Use temporary enclosures and other methods to limit dust and dirt migration. Comply with governing regulations pertaining to environmental protection.
   1. Provide ventilation to maintain non-toxic unpolluted working area for adjacent Owner's operating areas and construction/demolition areas. Welding and cutting torches producing smoke or toxic fumes must be adequately ventilated.

N. Special Conditions: The Contractor shall provide labor, materials and equipment to complete the work as by the Contract Documents, including but not limited to the following:
   1. The filing of all required notifications and variances, including the payment of all fees charged by all regulatory agencies.
   2. Work area preparation.
   3. General protection.
   4. Isolation barrier construction.
   5. Removal of all ACM, asbestos contaminated building components and decontamination of all surfaces, if required.
   6. Transportation and disposal of waste.
   7. Re-establishment of all building systems disrupted by the work of this contract.
   8. Repair or replacement, to the Owner's satisfaction, of any existing finishes, construction or other building components damaged during the work.
   9. Conduct daily inspections of all adjacent spaces and clean up as required.

1.8 SCHEDULING
   A. Arrange selective demolition schedule so as not to interfere with Owner's on-site operations.

1.9 WARRANTY
   A. Existing Special Warranty: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials so as not to void existing warranties.

PART 2 - PRODUCTS
2.1 REPAIR MATERIALS
   A. Use repair materials identical to existing materials.
      1. Where identical materials are unavailable or cannot be used for exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.
      2. Use materials whose installed performance equals or surpasses that of existing materials.

PART 3 - EXECUTION

3.1 EXAMINATION
   A. Verify location of all utilities. When required by the scope of work, make sure they have been disconnected and capped.
   B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
   C. Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.
   D. When unanticipated mechanical, electrical, or structural elements that conflict with the intended function or design are encountered, investigate and measure the nature and extent of the conflict. Promptly submit a written report to the Owner and Architect.
   E. Survey the condition of the building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of the structure or adjacent structures during selective demolition.
   F. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.
   G. Locate all existing utilities within project limits prior to any demolition.

3.2 OWNER’S FURNISHINGS AND EQUIPMENT
   A. Provide not less than 10 days advance notice to the Owner of activities that will affect Owner's operations.
   B. Contractor to provide all labor and material to temporarily relocate owner’s furnishings and equipment, including but not limited to desks, boxes, portable file cabinets, modular office furniture, chairs, credenzas, copiers, printers, computers, tables, fixed file cabinets, casework, shelving, etc., away from work areas and protect them against damage during selective demolition operations.
   C. Reinstall owner’s furnishings and equipment back to their original position once all demolition and construction in that area is completed.

3.3 UTILITY SERVICES
   A. Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
1. Do not interrupt existing utilities serving occupied or operating facilities, except when authorized in writing by the Owner and authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to the Owner and to governing authorities.
   a. Provide not less than 10 days notice to Owner if shutdown of service is required during changeover.

B. Utility Requirements: Locate, identify, disconnect, and seal or cap off indicated utility services serving building to be selectively demolished.
   1. Owner will arrange to shut off indicated utilities when requested by Contractor.
   2. Arrange to shut off indicated utilities with utility companies.
   3. Where utility services are required to be removed, relocated, or abandoned, provide bypass connections to maintain continuity of service to other parts of the building before proceeding with selective demolition.
   4. Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal the remaining portion of pipe or conduit after bypassing.

C. Utility Requirements: When applicable, refer to Division 15 Sections for shutting off, disconnecting, removing, and sealing or capping utility services. Do not start selective demolition work until utility disconnecting and sealing have been completed and verified in writing.

3.4 UTILITY ABANDONMENT AND REMOVAL

A. Abandoned Piping: Close open ends of abandoned underground piping that is indicated to remain in place. Provide sufficiently strong closures to withstand hydrostatic or earth pressure that may result after ends of abandoned utilities have been closed.
   1. Close open ends of concrete or masonry utilities with not less than 12 inches thick brick masonry bulkheads.
   2. Close open ends of piping with threaded metal caps, plastic plugs, or other acceptable methods suitable for size and type of material being closed. Wood plugs are not acceptable.

B. Removal: Dispose of removed material promptly unless directed by the owner to salvage removed utility pipes and other items.

3.5 PREPARATION

A. Drain, purge, or otherwise remove, collect, and dispose of chemicals, gases, explosives, acids, flammables, or other dangerous materials before proceeding with selective demolition operations.

B. Conduct demolition operations and remove debris to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.
   1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from the Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways.

C. Conduct demolition operations to prevent injury to people and damage to adjacent buildings and facilities to remain. Ensure safe passage of people around selective demolition area.
   1. Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by the Owner, as shown on drawings.
   2. Provide protective measures as required to provide free and safe passage of Owner's personnel and general public to and from occupied portions of building.
   3. Provide temporary barricades and other forms of protection as required to protect Owner's personnel and general public from injury due to selective demolition work.
D. Protect existing site improvements, appurtenances, and landscaping to remain.
   1. Erect a plainly visible fence around drip line of individual trees or around perimeter drip line of
groups of trees to remain.

E. Provide interior and exterior shoring, bracing, or support to prevent movement, settlement, or collapse of
structure or element to be demolished, and adjacent facilities or work to remain.

F. Protect from damage existing finish work that is to remain in place and becomes exposed during
demolition operations.

G. Protect floors with suitable coverings.

3.6 ENVIRONMENTAL CONTROLS

A. Cover and protect furniture, equipment and fixtures to remain from soiling or damage when demolition
work is performed in rooms or areas from which such items have not been removed.

B. Erect and maintain dust proof partitions and closures as required to prevent spread of dust or fumes to
occupied portions of the building.

C. Provide weatherproof closures for exterior openings resulting from demolition work. Use temporary
enclosures, and other suitable methods to limit the spread of dust and dirt. Comply with governing
environmental protection regulations. Ensure that no water leakage or damage occurs to structure or
interior areas.

D. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition
operations. Return adjacent areas to condition existing before start of selective demolition.

3.7 SELECTIVE DEMOLITION

A. Demolish and remove existing construction only to the extent required by new construction and as
indicated. Use methods required to complete Work within limitations of governing regulations and as
follows:
   1. Contractor shall check with owner project manager 10 days prior to demolition to see if they want
to keep any of the existing materials, products, equipment, etc. Contractor shall give them at least
one week to decide where on site they want the items they have decided to keep.
   2. Dispose of demolished items and materials promptly. On-site storage or sale of removed items is
   prohibited.
   3. Return elements of construction and surfaces to remain to condition existing before start of
   selective demolition operations.

B. If unanticipated mechanical, electrical, or structural elements that conflict with intended function or
design are encountered, investigate and measure both nature and extent of the conflict. Submit report to
the Owner in written, accurate detail. Pending receipt of directive from the Owner, rearrange selective
demolition schedule as necessary to continue overall job progress without undue delay.

C. Remove equipment and items indicated to be relocated in a manner that allows complete re-use. Make all
required repairs to equipment for proper operation. Reinstall equipment at the locations indicated on the
drawings. Provide all required equipment, items and materials indicated or as necessary for a functional
system.

3.8 PATCHING AND REPAIRS
A. Promptly patch and repair holes and damaged surfaces caused to adjacent construction by selective demolition operations.

3.9 DISPOSAL OF DEMOLISHED MATERIALS

A. General: Promptly dispose of demolished materials. Do not allow demolished materials to accumulate on-site.

B. Separate recyclable materials produced during selective demolition from other non-recyclable materials. Store or stockpile without intermixing with other materials and transport them to recycling facilities.

C. Burning: Do not burn demolished materials.

D. If hazardous materials are encountered during demolition operations, comply with applicable regulations, laws, and ordinances concerning removal, handling, and protection against exposure or environmental pollution.

E. Disposal: Transport demolished materials from Owner's property and legally dispose of them.

3.10 CLEANUP AND REPAIR

A. General: Upon completion of demolition work, remove tools, equipment, and demolished materials from site. Remove protections and leave interior areas broom clean.

1. Repair demolition performed in excess of that required. Return elements of construction and surfaces to remain to condition existing prior to start operations. Repair adjacent construction or surfaces soiled or damaged by selective demolition work.

END OF SECTION 02070
SECTION 06100 - ROUGH CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.


1.2 SUMMARY

A. This Section includes the following:

1. Rooftop equipment bases and support curbs.
2. Wood blocking, cants, and nailers.
3. Wood furring and grounds.
4. Wood sleepers.
5. Utility shelving.
6. Plywood backing panels.

1.3 DEFINITIONS

A. Exposed Framing: Framing not concealed by other construction.

B. Dimension Lumber: Lumber of 2 inches nominal or greater but less than 5 inches nominal in least dimension.

C. Timber: Lumber of 5 inches nominal or greater in least dimension.

D. Lumber grading agencies, and the abbreviations used to reference them, include the following:

1. NLGA: National Lumber Grades Authority.
2. SPIB: The Southern Pine Inspection Bureau.
3. WCLIB: West Coast Lumber Inspection Bureau.
4. WWPA: Western Wood Products Association.

1.4 SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.
2. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Include physical properties of treated materials based on testing by a qualified independent testing agency.
3. For fire-retardant treatments specified to be High-Temperature (HT) type, include physical properties of treated lumber both before and after exposure to elevated temperatures, based on testing by a qualified independent testing agency according to ASTM D 5664.
4. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.
5. Include copies of warranties from chemical treatment manufacturers for each type of treatment.

B. Material Certificates: For dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the ALSC Board of Review.

1.5 QUALITY ASSURANCE

A. Source Limitations for Engineered Wood Products: Obtain each type of engineered wood product through one source from a single manufacturer.

B. Fire-Test-Response Characteristics: For assemblies with fire-resistance ratings, provide materials and construction identical to those of assemblies tested for fire resistance per ASTM E 119 by a testing and inspecting agency acceptable to authorities having jurisdiction.


1.6 DELIVERY, STORAGE, AND HANDLING

A. Stack lumber flat with spacers between each bundle to provide air circulation. Provide for air circulation around stacks and under coverings.

B. Stack plywood and other panels flat with spacers between each bundle to provide air circulation. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.

1. Factory mark each piece of lumber with grade stamp of grading agency.
2. For exposed lumber indicated to receive a stained or natural finish, mark grade stamp on end or back of each piece and provide certificates of grade compliance issued by grading agency.
3. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.
4. Provide dressed lumber, S4S, unless otherwise indicated.
B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or does not comply with requirements for untreated material.

C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.
   1. For exposed lumber indicated to receive a stained or natural finish, mark end or back of each piece and provide certificates of treatment compliance issued by inspection agency.

D. Application: Treat all rough carpentry, unless otherwise indicated.

2.2 FIRE-RETARDANT-TREATED MATERIALS

A. General: Comply with performance requirements in AWPA C20 (lumber) and AWPA C27 (plywood).
   1. Use Exterior type for exterior locations and where indicated.
   2. Use Interior Type A, High Temperature (HT) for enclosed roof framing, framing in attic spaces, and where indicated.
   3. Use Interior Type A, unless otherwise indicated.

B. Identify fire-retardant-treated wood with appropriate classification marking of testing and inspecting agency acceptable to authorities having jurisdiction.
   1. For exposed lumber indicated to receive a stained or natural finish, mark end or back of each piece and provide certificates of treatment compliance issued by inspection agency.

C. For exposed items indicated to receive a stained or natural finish, use chemical formulations that do not bleed through, contain colorants, or otherwise adversely affect finishes.

D. Application: Treat all rough carpentry, unless otherwise indicated.
   1. Framing for raised platforms.
   2. Concealed blocking.
   3. Framing for non-load-bearing partitions, if indicated on drawings.
   4. Framing for non-load-bearing exterior walls if indicated on drawings.
   5. Roof construction, if indicated on drawings.
   6. Plywood backing panels, if indicated on drawings.

2.3 MISCELLANEOUS LUMBER

A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:
   1. Blocking.
   2. Nailers.
   3. Fire blocking.
   4. Rooftop equipment bases and support curbs.
   5. Cants.

B. For items of dimension lumber size, provide Construction or No. 2 grade lumber with 19 percent maximum moisture content of any species.
C. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate
knots and other defects that will interfere with attachment of other work.

D. For furring strips for installing plywood or hardboard paneling, select boards with no knots capable of
producing bent-over nails and damage to paneling.

2.4 PLYWOOD BACKING PANELS

A. Telephone and Electrical Equipment Backing Panels:  DOC PS 1, Exposure 1, C-D Plugged, fire-
retardant treated, in thickness indicated or, if not indicated, not less than 3/4-inch nominal thickness.

2.5 FASTENERS

A. General:  Provide fasteners of size and type indicated that comply with requirements specified in this
Article for material and manufacture.

1. Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or
in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with
ASTM A 153/A 153M or Type 304 stainless steel.

B. Nails, Brads, and Staples:  ASTM F 1667.


D. Wood Screws:  ASME B18.6.1.

E. Lag Bolts:  ASME B18.2.1.

F. Bolts:  Steel bolts complying with ASTM A 307, Grade A; with ASTM A 563 hex nuts and, where
indicated, flat washers.

G. Expansion Anchors:  Anchor bolt and sleeve assembly of material indicated below with capability to
sustain, without failure, a load equal to 6 times the load imposed when installed in unit masonry
assemblies and equal to 4 times the load imposed when installed in concrete as determined by testing per
ASTM E 488 conducted by a qualified independent testing and inspecting agency.


2.6 MISCELLANEOUS MATERIALS

A. Sill-Sealer Gaskets:  Closed-cell neoprene foam, 1/4 inch thick, selected from manufacturer's standard
widths to suit width of sill members indicated.

B. Adhesives for Gluing Furring and Sleepers to Concrete or Masonry:  Formulation complying with
ASTM D 3498 that is approved for use indicated by adhesive manufacturer.

1. Use adhesives that have a VOC content of 70 g/L or less when calculated according to 40 CFR 59,
Subpart D (EPA Method 24).

C. Water-Repellent Preservative:  NWWDA-tested and -accepted formulation containing 3-iodo-2-propynyl
butyl carbamate, combined with an insecticide containing chloropyrifos as its active ingredient.
D. Adhesives for Field Gluing Panels to Framing: Formulation complying with APA AFG-01 or ASTM D 3498 that is approved for use with type of construction panel indicated by manufacturers of both adhesives and panels.

1. Use adhesives that have a VOC content of 70 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry to other construction; scribe and cope as needed for accurate fit. Locate furring, nailers, blocking, grounds, and similar supports to comply with requirements for attaching other construction.

B. Framing Standard: Comply with AF&PA's "Details for Conventional Wood Frame Construction," unless otherwise indicated.

C. Do not splice structural members between supports, unless otherwise indicated.

D. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.

1. Provide metal clips for fastening gypsum board or lath at corners and intersections where framing or blocking does not provide a surface for fastening edges of panels. Space clips not more than 16 inches o.c.

E. Provide fire blocking in furred spaces, stud spaces, and other concealed cavities as indicated and as follows:

1. Fire block furred spaces of walls, at each floor level, at ceiling, and at not more than 96 inches o.c. with solid wood blocking or noncombustible materials accurately fitted to close furred spaces.
2. Fire block concealed spaces of wood-framed walls and partitions at each floor level, at ceiling line of top story, and at not more than 96 inches o.c. Where fire blocking is not inherent in framing system used, provide closely fitted solid wood blocks of same width as framing members and 2-inch nominal thickness.
3. Fire block concealed spaces between floor sleepers with same material as sleepers to limit concealed spaces to not more than 100 sq. ft. and to solidly fill space below partitions.
4. Fire block concealed spaces behind combustible cornices and exterior trim at not more than 20 feet o.c.

F. Sort and select lumber so that natural characteristics will not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.

G. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.

1. Use inorganic boron for items that are continuously protected from liquid water.
2. Use copper naphthenate for items not continuously protected from liquid water.

H. Securely attach rough carpentry work and sheathing to substrate by anchoring and fastening as indicated on drawings and complying with the following:
1. NES NER-272 for power-driven fasteners.

I. Use common wire nails, unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood; do not countersink nail heads, unless otherwise indicated.

J. For exposed work, arrange fasteners in straight rows parallel with edges of members, with fasteners evenly spaced, and with adjacent rows staggered.
   1. Comply with indicated fastener patterns where applicable. Before fastening, mark fastener locations, using a template made of sheet metal, plastic, or cardboard.
   2. Use finishing nails, unless otherwise indicated. Countersink nail heads and fill holes with wood filler.

K. Do not use materials with defects that impair quality of sheathing or pieces that are too small to use with minimum number of joints or optimum joint arrangement.

L. Cut sheathing panels at penetrations, edges, and other obstructions of work; fit tightly against abutting construction, unless otherwise indicated.

M. Use minimum 10d common wire nails and 8d ring shank nails, unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections. Install fasteners without splitting wood.

N. Coordinate wall and roof sheathing installation with flashing and joint-sealant installation so these materials are installed in sequence and manner that prevent exterior moisture from passing through completed assembly.

O. Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.

P. Coordinate sheathing installation with installation of materials installed over sheathing so sheathing is not exposed to precipitation or left exposed at end of the workday when rain is forecast.

3.2 WOOD GROUND, SLEEPER, BLOCKING, AND NAILER INSTALLATION

A. Install where indicated and where required for screeding or attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.

B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces, unless otherwise indicated.

C. Provide permanent grounds of dressed, pressure-preservative-treated, key-beveled lumber not less than 1-1/2 inches wide and of thickness required to bring face of ground to exact thickness of finish material. Remove temporary grounds when no longer required.

END OF SECTION 06100
SECTION 07200 – INSULATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:
   A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

1.2 DESCRIPTION OF WORK:
   A. Extent of insulation work is shown on drawings and indicated by provisions of this section.
   B. Applications of insulation specified in this section include the following:
      1. Board-type roof insulation
      2. Foil faced rigid building insulation.
      3. Sound attenuation insulation.
      4. Fire rated assembly insulation.

1.3 QUALITY ASSURANCE:
   A. Thermal Resistivity: Where thermal resistivity properties of insulation materials are designated by r-values they represent the rate of heat flow through a homogenous material exactly 1" thick, measured by test method included in referenced material standard or otherwise indicated. They are expressed by the temperature difference in degrees F between the two exposed faces required to cause one BTU to flow through one square foot per hour at mean temperatures indicated.
   B. Fire Performance Characteristics: Provide insulation materials which are identical to those whose fire performance characteristics, as listed for each material or assembly of which insulation is a part, have been determined by testing, per methods indicated below, by UL or other testing and inspecting agency acceptable to authorities having jurisdiction.

1.4 SUBMITTALS:
   A. Product Data: Submit manufacturer's product literature and installation instructions for each type of insulation and vapor retarder material required.
   B. Shop Drawings: Submit shop drawings for roof insulation. Including but not limited to plans, elevations, sections, details, and attachments to other work. Include R-value.

1.5 DELIVERY, STORAGE, AND HANDLING:
   A. General Protection: Protect insulation from physical damage and from becoming wet, soiled, or covered with ice or snow. Comply with manufacturer's recommendations for handling, storage and protection during installation.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS:
   A. Manufacturers: Subject to compliance with requirements, provide products of one of the following: (or Approved Equal)
      1. Manufacturers of Polyisocyanurate Board Insulation:
         a. Versico
b. GAF
c. Dow Chemical Company.
d. Rmax, Inc.

2. Manufacturers of Foil-Faced, Polyisocyanurate Board Insulation:
a. Dow Chemical Company.
b. Rmax, Inc.

a. Fibrex Insulations Inc.
b. Owens Corning.
c. Thermafiber.

4. Insulation Adhesives:
a. Sonneborn Building Products.
b. GEMCO.

5. Vapor Retarder:
a. Fortifiber.
b. Alumiseal.

6. Vapor Retarder Tape:
a. Avery Dennison Specialty Tape.

2.2 INSULATING MATERIALS:

A. General: Provide insulating materials which comply with requirements indicated for materials, compliance with referenced standards, and other characteristics. No asbestos containing materials are to be provided.

B. Polyisocyanurate Board Insulation (For exterior and roof insulation applications only): Sloped, rigid panels composed of closed cell polyisocyanurate foam core bonded to a performance bonded glass or fiber-reinforced facer cellular thermal insulation with glass-fiber-reinforced polyisocyanurate closed-cell foam core and inorganic facing laminated to both sides; Minimum R-value of 19 at 4” thickness; and as follows:
1. Density: 2.0 pounds per cubic foot minimum.
2. Surface Burning Characteristics: Maximum values for flame spread and smoke developed of 60 and 160, respectively.
3. Compressive strength: 20 pounds per square inch minimum.
6. Dimensional stability: 2 percent maximum linear change when conditioned at 158 F (70 C) and 98 percent relative humidity for seven days.
7. Curing time: 24 hours minimum, plus an additional 24 hours minimum per inch (25 mm) of thickness, at a minimum of 60 F (16 C) before shipment from the manufacturer.
8. Maximum Board size: 4-foot by 8-foot (1.2-m by 2.4-m) maximum board size for loose-laid and mechanically attached insulation boards, 4-foot by 4-foot (1.2-m by 1.2-m) maximum board size for insulation boards adhered to a substrate.
9. Board thickness: 2 inches (51 mm) maximum; when thicker total thicknesses are necessary, provide insulation boards in multiple layers to achieve the desired total thickness. When multiple insulation layers are used, the insulation board's joints in the top layer should be staggered vertically and offset from the joints in the underlaying layer(s).
10. Tapered insulation shall be used on top of the metal deck. Slope top of the tapered insulation 1/4" per 1'-0" to roof drain.

C. Foil-Faced, Polyisocyanurate Board Insulation:
1. ASTM C 1289, Type I, Class 1, with maximum flame-spread and smoke-developed indexes of 25 and 450, respectively, on thicknesses up to 4 inches.

D. Slag-Wool-Fiber/Rock-Wool-Fiber Blanket Insulation:
1. ASTM C 665, Type I (blankets without membrane facing); consisting of fibers; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively; passing ASTM E 136 for combustion characteristics.

2.3 AUXILIARY INSULATING MATERIALS:

A. Adhesive for Bonding Insulation: Type recommended by insulation manufacturer, and complying with requirements for fire performance characteristics.

B. Mastic Sealer: Type recommended by insulation manufacturer for bonding edge joints between units and filling voids in work.

PART 3 - EXECUTION

3.1 INSPECTION AND PREPARATION:

A. Require Installer to examine substrates and conditions under which insulation work is to be performed. A satisfactory substrate is one that complies with requirements of the section in which substrate and related work is specified. Obtain Installer's written report listing conditions detrimental to performance of work in this section. Do not proceed with installation of insulation until unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL:

A. Comply with manufacturer's instructions for particular conditions of installation in each case. If printed instructions are not available or do not apply to project conditions, consult manufacturer's technical representative for specific recommendations before proceeding with work.

B. Extend insulation full thickness as shown over entire area to be insulated. Cut and fit tightly around obstructions, and fill voids with insulation. Remove projections, which interfere with placement.

C. Apply a single layer of insulation of required thickness, unless otherwise shown or required to make up total thickness.

D. Slope insulation around roof drains.

3.3 INSTALLATION OF GENERAL BUILDING INSULATION:

A. Apply insulation units to substrate by method indicated, complying with manufacturer's recommendations. If no specific method is indicated, bond units to substrate with adhesive or use mechanical anchorage to provide permanent placement and support of units.

B. Seal joints between closed-cell (non-breathing) insulation units by applying mastic or sealant to edges of each unit to form a tight seal as units are shoved into place. Fill voids in completed installation with mastic or sealant.

C. Set vapor retarder faced units with vapor retarder to warm side of construction, except as otherwise indicated. Do not obstruct ventilation spaces, except for fire stopping.

1. Tape joints and ruptures in vapor retarder, and seal each continuous area of insulation to surrounding construction to ensure air-tight installation.

2. Pressure sensitive joint sealing tape should be used to cover all insulation joints. Pins, clips and any punctures or tears in the facing should be covered with vaporsealing, pressure sensitive patches to maintain the integrity of the vapor retarder. Follow tape manufacturer’s application recommendations and instructions.

3.4 INSTALLATION OF THERMAL INSULATION ON ROOF
A. Install board insulation on wood substrates by mechanically attached, as follows:
   1. Fasten insulation to wood substrates according to manufacturer's written instructions.
   2. Extend insulation horizontally to maintain a thermally sealed envelope.

3.5 INSTALLATION OF THERMAL INSULATION ON WALLS

A. Install board insulation on concrete and block substrates by adhesively attached, spindle-type insulation anchors as follows:
   1. Fasten insulation anchors to concrete substrates with insulation anchor adhesive according to anchor manufacturer's written instructions. Space anchors according to insulation manufacturer's written instructions for insulation type, thickness, and application indicated.
   2. Extend insulation vertically to the underside of the roof deck or floor slab above to maintain a thermally sealed envelope.

3.6 INSTALLATION OF SOUND ATTENUATION INSULATION

A. IN CEILINGS:
   1. Install 3-inch thick, unfaced glass or slag-wool-fiber/rock-wool fiber blanket insulation over suspended ceilings at partitions in a width that extends insulation 48 inches on either side of partition.
   2. Install 3-inch thick, unfaced glass or slag-wool-fiber/rock-wool fiber blanket insulation over suspended ceilings in rooms designated as acoustically treated room – see door schedule for all rooms with acoustically rated doors.

B. IN WALLS:
   1. Install 3-inch thick, unfaced glass or slag-wool-fiber/rock-wool fiber blanket insulation in all cavity and plumbing chase walls full height of the wall.

3.7 PROTECTION:

A. General: Protect installed insulation and vapor retarders from harmful weather exposures and from possible physical abuses, where possible by non-delayed installation of concealing work or, where that is not possible, by temporary covering or enclosure.

B. All insulation products should not be exposed to weather during shipping, storage or installation.

END OF SECTION
SECTION 07410 – STANDING SEAM METAL ROOF PANELS

PART 1 - GENERAL

1.1 REQUIREMENTS:

A. Section Includes: Standing seam metal roofing, flashing, and trim.

B. Work Included: Providing all labor, materials, tools, equipment and services to furnish and install metal roofing, wall panels/siding, including soffit, flashing, trim and such other accessories to make the system complete and weather tight, as indicated on the drawings and specified herein.

1.2 QUALITY ASSURANCE:

A. Applicator's Qualifications: Minimum 5 years’ experience in application of roofs of type herein specified. Manufacturer’s certification required.

B. Roofing Contractor must have successfully completed at least 3 projects of similar size and scope in the State of Florida in the last 5 years.

C. Before Fabrication: The contractor shall take field measurements of the structure and substrates indicated and specified to ensure that panel lengths and brakeformed flashings are dimensioned accurately to facilitate easy installation. Fabrication shall not begin until all field conditions have been verified. Allow for sufficient trimming of panel units at eaves, valleys, and gables prior to fabrication.


E. NRCA (The National Roofing Contractors Association) “Roofing and Waterproofing Manual” (including Construction Details), and “Handbook of Accepted Roofing Knowledge”.

F. Manufacturer’s Construction Details Handbook.


H. AISI Cold Formed Steel Design Manual.


1.3 SUBMITTALS:

A. Miami Dade County Product Approval and product data: Indicate material profile, jointing pattern, jointing details, fastening methods, and installation details.

B. Shop drawings are to be a small-scale layout of roof plan and elevation, indicating the extent of work to be performed. Include sections of roof, fascia, walls, siding and soffits, for each condition, detailing flashing and trim for different conditions, such as eaves, outside/inside corners, ridge, valleys, gutters, end wall terminations, closures, etc., showing a full and complete installation. Show attachment of panels and clips, spacing, type and number of fasteners, as recommended by the Manufacturer.
C. Sealed statement by Engineer, licensed in the State of Florida, stating that roofing assembly will conform to Florida Building Code Wind Requirements. Provide calculations showing wind pressures, clip spacing, and fastener quantity, size, type, and spacing.

D. Samples: Provide 24" x 24" sized sample of metal roofing mounted on plywood backing illustrating typical standing seam. Sample submittal shall also indicate the metal, gauge, color, texture, and finish proposed. Manufacturer's descriptive literature and Color Chart showing full range of standard colors.

E. Sample Warranties -
1. Manufacturer’s No Dollar Limit, edge to edge, weather tightness and panel warranty for the specified period of thirty (30) years.
2. Submit Manufacturer’s warranty covering the substrate (metal) against rupture, perforation, and structural failure due to normal atmospheric corrosion for thirty (30) years.
3. Submit Manufacturer’s thirty (30) year warranty on paint finish against cracking, peeling, blistering, chalk, and color change.

F. Letter from Manufacturer certifying the Contractor to install said material for issuance of NDL Warranty.

G. Submit Manufacturer’s Certificates complying with specified requirements.

1.4 DELIVERY, STORAGE AND HANDLING:
A. Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.

B. Unload and store materials at job-site to protect them from any damage.

C. Inspect delivered material. Prevent interference by other trades or any other adverse job conditions.

D. Store materials above ground, on skids. Stack performed and pre-finished material to prevent twisting, bending, or abrasion, and to provide ventilation. Protect material with waterproof covering and allow sufficient ventilation to prevent condensation build-up or moisture entrapment in the materials. Prevent contact with materials during storage that may cause discoloration or staining.

E. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.5 WARRANTY
A. Manufacturer’s Warranties shall be as follows:

B. Manufacturer shall provide a No Dollar Limit, Edge to Edge, thirty (30) year weather tightness warranty supplied by the Manufacturer.

C. Manufacturer shall warrant the metal roof against rupture or perforation or from structurally failing due to normal atmospheric conditions for a period of thirty (30) years.

D. Manufacturer shall provide a thirty (30) year finish warranty against peeling and blistering, chalk, and fade (color change).

E. The installer shall warrant the material and installation for a period of five (5) years from final completion acceptance, guaranteeing materials and workmanship for weather tightness, water tightness, and against
all leaks. During the initial five (5) year period, the Installer shall assure weather tightness and water tightness of the roof, without any cost to the building owner.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Garland Company, Inc. 3800 E. 91st St.; Cleveland, OH 44105; Tel: 800-321-9336; Tel: 216-641-7500; www.garlandco.com

B. Merchants and Evans, Inc 308 Connecticut Dr. Burlington, NJ 08016; Tel: 800-257-6215; 609-387-3033; www.ziprib.com

C. Englert 1200 Amboy Avenue, Perth Amboy, NJ 08861; Tel: 800-364-5378 www.englertinc.com

2.2 ACCEPTABLE SYSTEMS

A. R-Mer Span by Garland Co.

B. Zip-Rib by Merchants and Evans

C. Englert Series S2500

2.3 STANDING SEAM METAL ROOFING PANELS

A. Width of Standing T-Seam Panel: 1 inch T-seam
   1. 16 inches

B. Standing Seam: 2-3/8 inch tall mechanically seamed with factory installed hot melt sealant in-seam cap. Panel/Cap is configured with a total of 4 layers of metal surrounding anchor clip.

C. Panel Profile: Provided with minimum 1-1/2 inches wide elevated mesa's every 2 inches on center continuous throughout panel.

D. Panel material:
   1. 0.040” Aluminum Alloy 3105-H14

E. Flashing and flat stock material: Fabricate in profiles indicated on Drawings of same material, thickness, and finish as roof system, unless indicated otherwise.

F. Exposed surfaces for coated panels
   1. Two coat coil applied, baked-on full- strength (70% resin) fluorocarbon coating system (polymethylide fluoride, PVF2), applied by manufacturer's approved applicator.
   2. Coating system shall provide nominal 1.0 mil dry film thickness, consisting of primer and color coat.

G. Unexposed surfaces for coated panels shall be baked-on polyester coating with .20 to .30 dry film thickness (TDF).
H. Panel Length—Panels are to be pre-manufactured or rolled form to the exact length. Breaks in the panels are not allowed. Panels to be continuous up to 60’ run.

I. Accessory Components:
   1. Anchor Clips:
      a. Concealed Standard Anchor Clips: Clips 16 gauge stainless steel, alloy 316L, 1 piece clip with projecting legs for additional panel alignment and provision for unlimited thermal movement in each direction along the longitudinal dimension.
   2. Gable anchor clips for:
      a. Standing Seam style.
      b. Stainless steel, alloy 316L, minimum thickness: 16 gauge.
   3. Fasteners:
      a. Concealed fasteners: Corrosion resistant steel fasteners (zinc plated, stainless steel or equal) designed to meet structural loading requirements.
      b. Exposed fasteners: Series 410 stainless steel fasteners or 1/8 inch diameter stainless steel waterproof rivets. All exposed fasteners shall be factory painted to match the color of the standing seam panels.
   4. Closures: Factory precut closed cell foam meeting ASTM D 1056 or ASTM D 3575, enclosed in metal channel matching panels when used at hip, ridge, rake, and jamb.
   5. Provide all miscellaneous accessories for complete installation.

2.4 STANDING SEAM METAL ROOFING ACCESSORIES

A. Underlayment:
   1. (2) layers of Versashield, Fire resistant roof deck protection. UL Class A rating.
   2. 30# Specification Felt Roof Underlayment. ASTM D4869, Type IV, ASTM D226, Type II.

B. Sealant:
   2. Exposed Applications: UV Resistant Tripolymer Sealant – Geocel Corporation, 2300 Tripolymer Sealant, or equal.

2.5 METAL ROOFING ACCESSORIES

A. Sheet Stock: High gloss, factory painted Aluminum
   1. Material thickness: 0.040” Aluminum Alloy 3105-H14
   2. Color: By owner

PART 3 - EXECUTION

3.1 INSPECTION:

A. Inspect roof deck to verify deck is clean and smooth, free of depressions, waves, or projections.

B. Verify roof openings, curbs, pipes, sleeves, ducts, or vents through roof are solidly set, cant strips and reglets in place.
C. Verify substrate is uniform, even and symmetrical by running a string test. Inspect to assure that all substructure/framing members are flat and insulation is embedded symmetrically so when the metal panels are applied, they will not appear wavy or distorted.

D. Provide a written report of discrepancies or variations in the substrate to the Architect.

E. Do not begin installation until unsatisfactory conditions are corrected.

F. Do not proceed with installation until adjoining areas scheduled for stucco treatment have been stuccoed and washed down. Do not wash down acid residues from stucco directly over the metal panels.

G. Commencement of installation shall signify acceptance of the substrate and adjacent conditions as being proper and acceptable for treatment of roofing.

H. After beginning installation, submit approximately 500 square feet of product in place for Architect’s approval, before proceeding with substantial work.

3.2 INSTALLATION:

A. Installation shall be made in accordance with Manufacturer’s recommended procedures and layout drawings. Manufacturer’s construction Details Handbook, SMACNA Architectural Sheet Metal manual, NRCA Roofing and Waterproofing Manual and Handbook of Roofing Knowledge shall be used as guides whenever applicable.

B. Structural Deck Substrate:
   1. Inspect metal roof deck to verify deck is clean and smooth, free of depressions, waves, or projections, and properly sloped.
   2. Verify deck is dry and joints are solidly supported and fastened.
   3. Refasten the metal deck as per details provided on the drawing sheets.

C. Remove all damaged steel deck. Replace with new material.

D. Install new 3/4” plywood over existing metal deck using minimum 3” long, #14 pan head screws at 6” o.c. Longer screw lengths may be required for some roof conditions – provide minimum 3” embedment into structure throughout. Contractor must locate structural members before driving any screws at exposed ceiling areas.

E. The metal panel system shall be installed plumb, level, and straight over a layer of 30 lb. Fire Barrier underlayment, #30 lb. nail down base sheet and 90 lb peel and stick waterproofing membrane. Provide a minimum 6” for horizontal lap and 12” for end lap.

F. Exposed fasteners, screws and/or roof mastic are unacceptable and will be rejected. System configuration only allows for exposed fasteners at panel overlap, if required, and at trim details in accordance with the Manufacturer's requirements

G. Install flashings and furring channels as recommended by manufacturer; spacing and fasteners to comply with wind load requirements.

H. Install roofing system plumb, straight, and true to adjacent work. The (standing; batten) seam shall be equidistant and shall align for corners, hips, valleys, mullions, and columns in accordance with architectural design parameters as shown on the drawings.

I. Do not deviate from Architectural Detail without prior authorization.
J. No face penetrations or perforation shall be made in metal panels by fasteners without architect’s specific approval. All panels shall be continuous from ridge to eaves with no horizontal end laps. Horizontal lap joints not acceptable.

K. Standing seams 16” o/c. Install hold down brackets to allow for thermal movement at each panel joint. Arrange longitudinal spacing of hold down brackets to allow for positive uniform load conforming to wind load requirements.

L. Coat contacting dissimilar metals with bituminous coating, 7-1/2 mil dry film thickness, minimum, applied to each contacting metal face.

M. End lap all flashing and trim at least 3”. All gutters must be mitered, soldered and caulked with a lining of self-adhering water proofing membrane applied at the laps to make it watertight. All butt joints must be caulked. Soldered areas shall be counterflashed or painted to match. All valleys shall be treated with a layer of self-adhering water proofing membrane spread out at least 24” each side from the center of the valley, on both sides, before applying valley flashing. End lap at least 6” at joints.

N. Provide a continuous sheet metal trim and drip edge along exterior face of the roof fascia. Provide continuous cleat to secure drip edge.

O. Exercise proper care during installation to avoid damage or scratching of the panels. Avoid walking over the metal roof after installation is completed.

3.3 CLEANING AND PROTECTION:

A. Peel of any strippable film on flashing as they are installed.

B. Complete all items on punch list.

C. Touch up all minor scratches and spots.

D. Remove all debris resulting from work under this Section.

END OF SECTION 07410
SECTION 07550 – MODIFIED BITUMINOUS ROOFING

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Torch Applied 2-Ply Asphalt Roofing (StressPly IV). (2.16)(3.8)

B. Accessories. (2.19)

C. Edge Treatment and Roof Penetration Flashings. (2.20)(3.9)

1.2 REFERENCES

1. ASTM D 41 - Standard Specification for Asphalt Primer Used in Roofing, Damp proofing, and Waterproofing.

2. ASTM D 312 - Standard Specification for Asphalt used in Roofing.


20. ASCE 7, Minimum Design Loads for Buildings and Other Structures


22. FM Approvals - Roof Coverings and/or RoofNav assembly database.

1.3 SUBMITTALS

A. Provide the following to the Owner at the time of bid submittal for roofing work.

1. Written certification from the roofing system manufacturer corporate officer certifying that the applicator is currently approved for installation of the specified roofing system.

2. Descriptive product data including MSD sheets.

3. Certification of Class A roof system.

4. Sample copy of contractor’s workmanship warranty.

5. Sample copy of specified Manufacturer’s warranty.

6. Sample copy of Manufacturer’s Architectural indemnification Agreement.

B. Product Data: Submit brochures containing material samples, SDS, schedules, charts, literature, and illustrations to indicate the performance, fabrication procedures, product variations, and accessories.

Within four (4) weeks of award of contract, submit:

Minimum of two (2) samples of each sheet material and descriptive literature.

Manufacturer’s specifications and other independent test data according to ASTM designation D-5147-91 "Standard Test Methods for Sampling and Testing Modified Bituminous Sheet Material" needed to prove compliance with specified requirements.

All other data and information to satisfy requirements of manufacturer on warranty needs.

A written statement from the roofing materials manufacturers’ corporate officer approving the installer and stating the intent to guarantee the completed project as specified.

Samples of proposed warranty complete with any addenda necessary to meet the warranty requirements as specified.

Certified copy of ISO 9001 compliance.

C. Shop Drawings: Submit shop drawings including installation details of roofing, flashing, fastening, insulation and vapor barrier, including notation of roof slopes and fastening patterns of insulation and base modified bitumen membrane. Indicate size and materials. Show locations and installation procedures. Submit one electronic original prior to the job start and retain approved copies at the site.

D. Design Pressure Calculations: Submit design pressure calculations for the roof area in accordance with ASCE 7-10 and local Building Code requirements. Include a roof system attachment analysis report, certifying the system's compliance with applicable wind load requirements before Work begins. Report shall be signed and sealed by a Professional Engineer registered in the State of Florida who has provided roof system attachment analysis for not less than 5 consecutive years.

E. Maintenance Procedures: Upon substantial completion of the project, deliver to Owner three (3) copies of manufacturers printed instructions regarding care and maintenance of the roof.

F. Verification Samples: For each modified bituminous membrane ply product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.
G. Manufacturer's Certificates: Provide to certify products meet or exceed specified requirements.

H. Test Reports: Submit test reports, prepared by an independent testing agency, for all modified bituminous sheet roofing, indicating compliance with ASTM D5147. Testing must be performed at 77 deg. F. Tests at 0 deg. F will not be considered.

I. Manufacturer's Fire Compliance Certificate: Certify that the roof system furnished is approved by Factory Mutual (FM), Underwriters Laboratories (UL), Warnock Hersey (WH) or approved third party testing facility in accordance with ASTM E108, Class A for external fire and meets local or nationally recognized building codes.

J. Litigation and settlements: provide a notarized statement from a corporate officer of the manufacturer stating roofing system manufacturer has not settled litigation or paid fines to a public agency in excess of $20 million dollars.

K. Closeout Submittals: Provide manufacturer's maintenance instructions that include recommendations for periodic inspection and maintenance of all completed roofing work. Provide product warranty executed by the manufacturer. Assist Owner in preparation and submittal of roof installation acceptance certification as may be necessary in connection with fire and extended coverage insurance on roofing and associated work.

1.4 QUALITY ASSURANCE

A. Perform Work in accordance with NRCA Roofing and Waterproofing Manual.

B. Manufacturer Qualifications: Company specializing in manufacturing products specified with documented ISO 9001 certification and minimum of twelve years of documented experience and must not have been in Chapter 11 bankruptcy during the last five years.

C. Installer Qualifications: Company specializing in performing Work of this section with minimum five years documented experience and a certified Pre-Approved Garland Contractor.

D. Installer's Field Supervision: Maintain a full-time Supervisor/Foreman on job site during all phases of roofing work while roofing work is in progress.

E. Product Certification: Provide manufacturer's certification that materials are manufactured in the United States and conform to requirements specified herein, are chemically and physically compatible with each other, and are suitable for inclusion within the total roof system specified herein.

F. Source Limitations: Obtain all components of roof system from a single manufacturer. Secondary products that are required shall be recommended and approved in writing by the roofing system Manufacturer. Upon request of the Architect or Owner, submit Manufacturer's written approval of secondary components in list form, signed by an authorized agent of the Manufacturer.

1.5 PRE-INSTALLATION MEETINGS

A. Convene minimum two weeks prior to commencing Work of this section.

B. Review installation procedures and coordination required with related Work.

C. Inspect and make notes of job conditions prior to installation:

D. Record minutes of the conference and provide copies to all parties present.
E. Identify all outstanding issues in writing designating the responsible party for follow-up action and the timetable for completion.

F. Installation of roofing system shall not begin until all outstanding issues are resolved to the satisfaction of the Architect.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store products in manufacturer's unopened packaging with labels intact until ready for installation.

B. Store all roofing materials in a dry place, on pallets or raised platforms, out of direct exposure to the elements until time of application. Store materials at least 4 inches above ground level and covered with "breathable" tarpaulins.

C. Stored in accordance with the instructions of the manufacturer prior to their application or installation. Store roll goods on end on a clean flat surface. No wet or damaged materials will be used in the application.

D. Store at room temperature wherever possible, until immediately prior to installing the roll. During winter, store materials in a heated location with a 50 degree F (10 degree C) minimum temperature, removed only as needed for immediate use. Keep materials away from open flame or welding sparks.

E. Avoid stockpiling of materials on roofs without first obtaining acceptance from the Architect/Engineer.

F. Adhesive storage shall be between the range of above 50 degree F (10 degree C) and below 80 degree F (27 degree C). Area of storage shall be constructed for flammable storage.

1.7 COORDINATION

A. Coordinate Work with installing associated metal flashings as work of this section proceeds.

1.8 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.9 WARRANTY

A. Upon completion of the work, provide the Manufacturer's written and signed No Dollar Limit, edge to edge, Warranty, warranting that, if a leak develops in the roof during the term of this warranty, due either to defective material or defective workmanship by the installing contractor, the manufacturer shall provide the Owner, at the Manufacturer's expense, with the labor and material necessary to return the defective area to a watertight condition.

1. Warranty Period: 30 years from date of acceptance.

B. Installer is to guarantee all work against defects in materials and workmanship for a period indicated following final acceptance of the Work.

1. Warranty Period: 5 years from date of acceptance
PART 2 - PRODUCTS

2.1 MANUFACTURERS


B. GAF Materials Corporation; 1361 Alps Road, Wayne, New Jersey 07470

2.2 TORCH APPLIED 2-PLY ASPHALT SYSTEM

A. Base (Ply) Sheet:
   1. HPR Torch Base

B. Modified Cap (Ply) Sheet: One ply bonded to the prepared substrate with interplay adhesive.
   1. StressPly IV Mineral:

C. Interply Adhesive:
   1. N/A

D. Flashing Base Ply:
   1. HPR Torch Base:

E. Flashing Cap (Ply) Sheet
   1. StressPly IV Mineral:

F. Flashing Ply Adhesive:
   1. None for torch sheets only.

G. Surfacing:
   1. Surface Coatings
      a. Garla-Brite

2.3 ACCESSORIES:


B. Nails and Fasteners: Non-ferrous metal or galvanized steel, except that hard copper nails shall be used with copper; aluminum or stainless steel nails shall be used with aluminum; and stainless steel nails shall be used with stainless steel, Fasteners shall be self-clinching type of penetrating type as recommended by the deck manufacturer. Fasten nails and fasteners flush-driven through flat metal discs not less than 1 inch (25 mm) diameter. Omit metal discs when one-piece composite nails or fasteners with heads not less than 1 inch (25 mm) diameter are used.

C. Sealant - Green-Lock Structural Adhesive: Single component, 100% solids structural adhesive as furnished and recommended by the membrane manufacturer.
   1. Elongation, ASTM D 412: 300%
   2. Hardness, Shore A, ASTM C 920: 50
   3. Shear Strength, ASTM D 1002: 300 psi
D. Butyl Tape: 100% solids, asbestos free and compressive tape designed to seal as recommended and furnished by the membrane manufacturer.

2.4 EDGE TREATMENT AND ROOF PENETRATION FLASHINGS

A. EDGE SECUREMENT: Edge metal must be ANSI/SPRI ES1 compliant, as required by Florida Building Code.

B. Pre-Manufactured Coping Cap Cover and Splice Plate.
1. Zinc-coated steel, ASTM A653, coating designation G-90, in thickness of 22 gauge, 36" to 48" by coil length, chemically treated, commercial or lock-forming quality.

C. Pre-Manufactured Coping Cap:
1. Zinc-coated steel, ASTM A653, coating designation G-90, in thickness of 0.0635 nom./ 16 gauge, 36" to 48" by coil length, chemically treated, commercial or lock-forming quality.

D. Pre-Manufactured Edge Metal Finishes:
1. Exposed and unexposed surfaces for mill finish flashing, fascia, and coping cap, as shipped from the mill
2. Exposed surfaces for coated panels:
   a. Steel Finishes: fluorocarbon finish. Epoxy primer baked both sides,. 2-.25 mils thickness as approved by finish coat manufacturer. Weathering finish as referred by National Coil Coaters Association (NCCA). Provided with the following properties.
      2) Bend: ASTM D-4145, O-T / NCCA II-19
      3) Cross-Hatch Adhesion: ASTM D3359, no loss of adhesion
      4) Gloss (60 deg. angle): ASTM D523, 25+/-5%
      5) Reverse Bend: ASTM D2794, no cracking or loss of adhesion
      6) Nominal Thickness: ASTM D1005
         a) Primer: 0.2 mils
         b) Topcoat, 0.7 mils min
         c) Clear Coat (optional, only used with 22 ga. steel) 0.3 mils

7) Color: Provide as specified. (Subject to minimum quantities)

E. Manufactured Flashing Ply: Ply galvalume steel and modified membrane roof termination/flashing system comprised of a flexible, tie-in membrane, factory-bonded within a watertight, mechanical seal to a galvalume steel vertical flashing or fascia reveal profile. Siliconized modified polyester, epoxy primer baked both sides. Modified membrane is a 180 mil, Styrene-Butadiene-Styrene SBS (Styrene-Butadiene-Styrene) rubber modified membrane reinforced with a dual fiberglass scrim.
1. Tensile Strength, ASTM D 5, 147
   a. 2 in/min. @ 73.4 +/- 3.6 deg. F MD 210 lb/in CMD 210 lb/in
   b. 50 mm/min. @ 23 +/- 3 deg. C MD 36.75 kN/m CMD 36.75 kN/m
2. Tear Strength, ASTM D 5147
   a. 2 in/min. @ 73.4 +/- 3.6 deg. F MD 250 lb CMD 250 lb
   b. 50 mm/min. @ 23 +/- 3 deg. C MD 1112 N CMD 1112 N
3. Elongation at Maximum Tensile, ASTM D5147
   a. 2 in/min. @ 73.4 +/- 3.6 deg. F MD 6.0% CMD 6.0%
   b. 50 mm/min. @ 23 +/- 3 deg. C MD 6.0% CMD 6.0%
4. Low Temperature Flexibility, ASTM D5147: Passes -30 deg. F (-34 deg. C)
5. Coating Properties:
   a. Pencil Hardness, NCCA II-2 - ASTM D3363, F-H
   b. Bend, NCCA II-19, ASTM D 4145, 2-T
   c. Adhesion / Cross-Hatch, ASTM D3359, no loss of adhesion
   d. Gloss (60 deg. angle), ASTM D 523, 90 +/- 5%
e. Reverse Impact, ASTM D 2794no cracking or loss of adhesion

MODIFIED BITUMINOUS ROOFING

07550 - 6
f. Nominal Thickness, ASTM D 1005, primer and topcoat 1.0 mils.

F. Drain Flashings should be 4lb (1.8kg) sheet lead formed and rolled.

G. Liquid Flashing - Tuff-Flash: An asphaltic-polyurethane, low odor, liquid flashing material designed for specialized details unable to be waterproofed with typical modified membrane flashings.
1. Tensile Strength, ASTM D 412: 400 psi
2. Elongation, ASTM D 412: 300%
3. Density @77 deg. F 8.5 lb/gal typical

H. Fabricated Flashings: Fabricated flashings and trim are specified in Section 07620.
1. Fabricated flashings and trim shall conform to the detail requirements of SMACNA "Architectural Sheet Metal Manual" and/or the CDA Copper Development Association "Copper in Architecture - Handbook" as applicable.

I. Manufactured Roof Specialties: Shop fabricated copings, fascia, gravel stops, control joints, expansion joints, joint covers and related flashings and trim are specified in Section 07710.
1. Manufactured roof specialties shall conform to the detail requirements of SMACNA "Architectural Sheet Metal Manual" and/or the NRCA "Roofing and Waterproofing Manual" as applicable.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. Inspect and approve the deck condition, slopes and fastener backing if applicable, parapet walls, expansion joints, roof drains, stack vents, vent outlets, nailers and surfaces and elements.

C. Verify that work penetrating the roof deck, or which may otherwise affect the roofing, has been properly completed.

D. If substrate preparation and other conditions are the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. General: Clean surfaces thoroughly prior to installation.
1. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
2. Fill substrate surface voids that are greater than 1/4 inch wide with an acceptable fill material.
3. Roof surface to receive roofing system shall be smooth, clean, free from loose gravel, dirt and debris, dry and structurally sound.
4. Wherever necessary, all surfaces to receive roofing materials shall be power broom and vacuumed to remove debris and loose matter prior to starting work.
5. Do not apply roofing during inclement weather. Do not apply roofing membrane to damp, frozen, dirty, or dusty surfaces.
6. Fasteners and plates for fastening components mechanically to the substrate shall provide a minimum pull-out capacity of 300 lbs. (136 k) per fastener. Base or ply sheets attached with cap nails require a minimum pullout capacity of 40 lb. per nail.
7. Prime decks where required, in accordance with requirements and recommendations of the primer and deck manufacturer.

B. Lightweight Insulating Concrete Deck
   1. Lightweight insulating concrete decks are required to have a minimum thickness of 2 inches (51 mm), a minimum compressive strength of 125 psi (0.86 MPa) and a minimum density of 22 pcf (352 kg/sm).
   2. Install roof system immediately following deck curing to prevent damage from exposure to precipitation. The deck manufacturer determines the minimum curing time and maximum exposure limitations.
   3. LWIC shall not be poured during rainy periods. Deck areas that have frozen before they have cured shall be removed and replaced. Decks which receive precipitation prior to installation of the roof membrane shall be checked for moisture content and dryness.
   4. Lightweight insulating concrete decks are acceptable only on slopes up to 1 inch per foot (83 mm/m).
   5. Do not attach insulation directly to lightweight concrete decks. Over old, dry decks, additional board insulation may be solidly mopped to an approved mechanically attached anchor sheet (base sheet).

C. Insulation: Roof insulation is specified in Section
   1. All joints between layers should be staggered when multiple layers of insulation are installed. Insulation greater than 2.5 inches shall be installed in multiple layers.
   2. Insulation shall be kept dry at all times. Install only as much insulation as can be covered with completed roofing membrane before the end of the day's work or prior to onset of inclement weather.
   3. Edges shall butt tightly and all cuts shall fit neatly against adjoining surfaces to provide a smooth overall surface. Gaps of greater than 1/4 inch width shall be filled with insulation.
   4. Install tapered insulation around roof drains and penetrations to provide adequate slope for proper drainage.
   5. Mechanically attached insulation shall be fastened in accordance with code and insurance requirements for the applicable geographic zone with the required number and type of fasteners and plates.
   6. When asphalt or cold adhesive attachment is specified, the proposed insulation shall be compatible with the roof substrate, the proposed bitumen and the requirements of the specific membrane.
   7. Crickets shall be formed per tapered design to properly direct water to the internal drains. Minimum slope of ½” per foot required for all crickets.

3.3 INSTALLATION - GENERAL

A. Install modified bitumen membranes and flashings in accordance with manufacturer's instructions and with the recommendations provided by the National Roofing Contractors Association's Roofing & Waterproofing Manual, the Asphalt Roofing Manufacturers Association, and applicable codes.

B. General: Avoid installation of modified bitumen membranes at temperatures lower than 40-45 degrees F. When work at such temperatures unavoidable use the following precautions:
   1. Take extra care during cold weather installation and when ambient temperatures are affected by wind or humidity, to ensure adequate bonding is achieved between the surfaces to be joined. Use extra care at material seam welds and where adhesion of the applied product to the appropriately prepared substrate as the substrate can be affected by such temperature constraints as well.
   2. Unrolling of cold materials, under low ambient conditions must be avoided to prevent the likelihood of unnecessary stress cracking. Rolls must be at least 40 degrees F at the time of application. If the membrane roll becomes stiff or difficult to install, it must be replaced with roll from a heated storage area.
C. Commence installation of the roofing system at the lowest point of the roof (or roof area), working up the slope toward the highest point. Lap sheets shingle fashion so as to constantly shed water.

D. All slopes greater than 2:12 require back-nailing to prevent slippage of the ply sheets. Use ring or spiral-shank 1 inch cap nails, or screws and plates at a rate of 1 fastener per ply (including the membrane) at each insulation stop. Place insulation stops at 16 ft o.c. for slopes less than 3:12 and 4 feet o.c. for slopes greater than 3:12. On non-insulated systems, nail each ply directly into the deck at the rate specified above. When slope exceeds 2:12, install all plies parallel to the slope (strapping) to facilitate backnailing. Install 4 additional fasteners at the upper edge of the membrane when strapping the plies.

3.4 INSTALLATION TORCH APPLIED 2-PLY ASPHALT ROOFING

A. Base Ply: Install torch base sheet to a properly prepared substrate. Shingle in proper direction to shed water on each area of roofing.
   1. Lay out the roll in the course to be followed and unroll 6 feet (1.8 m).
   2. Using a roofing torch, heat the surface of the coiled portion until the burn-off backer melts away. At this point, the material is hot enough to lay into the substrate. Progressively unroll the sheet while heating and press down with your foot to insure a proper bond.
   3. After the major portion of the roll is bonded, re-roll the first 6 feet (1.8 m) and bond it in a similar fashion.
   4. Repeat this operation with subsequent rolls with side laps of 4 inches (101 mm) and end laps of 8 inches (203 mm).
   5. Give each lap a finishing touch by passing the torch along the joint and spreading the melted bitumen evenly with a rounded trowel to insure a smooth, tight seal.
   6. Extend underlayment 2 inches (50 mm) beyond top edges of cants at wall and projection bases.
   7. Install base flashing ply to all perimeter and projections details.

B. Modified Cap (Ply) Sheet: Over torch base sheet underlayment, lay out the roll in the course to be followed and unroll 6 feet (1.8 m). Stagger seams over the torch base sheet seams.
   1. Using a roofing torch, heat the surface of the coiled portion until the burn-off backer melts away. At this point, the material is hot enough to lay into the substrate. Progressively unroll the sheet while heating and press down with your foot to insure a proper bond.
   2. After the major portion of the roll is bonded, re-roll the first 6 feet (1.8 m) and bond it in a similar fashion.
   3. Repeat this operation with subsequent rolls with side laps of 4 inches (101 mm) and end laps of 8 inches (203 mm).
   4. Give each lap a finishing touch by passing the torch along the joint and spreading the melted bitumen evenly with a rounded trowel to insure a smooth, tight seal.

C. Fibrous Cant Strips: Provide non-combustible perlite or glass fiber cant strips at all wall/curb detail treatments where angle changes are greater than 45 degrees. Cant may be set in approved cold adhesives, hot asphalt or mechanically attached with approved plates and fasteners.

D. Wood Blocking, Nailers and Cant Strips: Provide wood blocking, nailers and cant strips as specified in Section 06114.
   1. Provide nailers at all roof perimeters and penetrations for fastening membrane flashings and sheet metal components.
   2. Wood nailers should match the height of any insulation, providing a smooth and even transition between flashing and insulation areas.
   3. Nailer lengths should be spaced with a minimum 1/8 inch gap for expansion and contraction between each length or change of direction.
   4. Nailers and flashings should be fastened in accordance with Factory Mutual "Loss Prevention Data Sheet 1-49, Perimeter Flashing" and be designed to be capable of resisting a minimum force of 200 lbs/lineal foot in any direction.
E. Metal Work: Provide metal flashings, counter flashings, parapet coping caps and thru-wall flashings as specified in Section 07620 or Section 07710. Install in accordance with the SMACNA "Architectural Sheet Metal Manual" or the NRCA Roofing Waterproofing manual.

F. Termination Bar: Provide a metal termination bar or approved top edge securement at the terminus of all flashing sheets at walls and curbs. Fasten the bar a minimum of 8 inches (203 mm) o/c to achieve constant compression. Provide suitable, sealant at the top edge if required.

G. Flashing Base Ply: Seal all curb, wall and parapet flashings with an application of mastic and mesh on a daily basis. Do not permit conditions to exist that will allow moisture to enter behind, around or under the roof or flashing membrane.
   1. Prepare all walls, penetrations, expansion joints, and other surfaces to be flashed with asphalt primer at the rate of 100 square feet per gallon. Allow primer to dry tack free.
   2. Adhere modified flashing base to the underlying base flashing ply with specified flashing ply adhesive. Nail off at a minimum of 8 inches (203 mm) o.c. from the finished roof at all vertical surfaces.
   3. Solidly adhere the entire sheet of flashing membrane to the substrate. Tops of all flashings that are not run up and over curb shall be secured through termination bar 6 inches (152 mm) and sealed at top.
   4. Seal all vertical laps of flashing membrane with a three-course application of trowel-grade mastic and fiberglass mesh.
   5. Coordinate counter flashing, cap flashings, expansion joints, and similar work with modified bitumen roofing work.
   6. Coordinate roof accessories, miscellaneous sheet metal accessory items, including piping vents and other devices with the roofing system work. When using mineralized cap sheet all stripping plies type IV felt / Versiply 40 shall be installed prior to cap sheet installation.

H. Flashing Cap Ply: Install flashing cap sheets by the same application method used for the base ply.
   1. Seal curb, wall and parapet flashings with an application of mastic and mesh on a daily basis. Do not permit conditions to exist that will allow moisture to enter behind, around or under the roof or flashing membrane.
   2. Prepare all walls, penetrations, expansion joints and where shown on the Drawings to be flashed with required primer at the rate of 100 square feet per gallon. Allow primer to dry tack free.
   3. Adhere to the underlying base flashing ply with specified flashing ply adhesive unless otherwise specified. Nail off at a minimum of 8 inches (203 mm) o.c. from the finished roof at all vertical surfaces.
   4. Coordinate counter flashing, cap flashings, expansion joints and similar work with modified bitumen roofing work as specified.
   5. Coordinate roof accessories, miscellaneous sheet metal accessory items with the roofing system work.
   6. All stripping shall be installed prior to flashing cap sheet installation.
   7. Heat and scrape granules when welding or adhering at cut areas and seams to granular surfaces at all flashings.
   8. Secure the top edge of the flashing sheet using a termination bar only when the wall surface above is waterproofed, or nailed 4 inches on center and covered with an acceptable counter flashing.

I. Roof Walkways: Provide walkways in areas indicated on the Drawings.

3.5 INSTALLATION EDGE TREATMENT AND ROOF PENETRATION FLASHING

A. Pre-manufactured Snap-On Coping Cap:
   1. Install miters first.
   2. Position base flashing ply over the wall edge covering nailers completely, fastening 8 inches on center. Install base ply and thermoplastic cap ply with proper material and procedure according to manufacturer's recommendations.
3. Install minimum 16 gauge, 16 inch long by specified width anchor chair at [Contact Garland Representative] feet on center.

4. Install 6 inch wide splice plate by centering over 16 inch long by specified width anchor chair. Apply two beads of sealant to either side of the splice plate's center. Approximately 2 inches from the coping cap joint. Install Coping Cap by hooking outside hem of coping on outside face of anchor chair. Press downward on inside edge of coping until "snap" occurs and hem is engaged on the entire chair.

B. Surface Mounted Counterflashing:
1. Minimum flashing height is 8 inches (203 mm) above finished roof height. Maximum flashing height is 24 inches (609 mm). Prime vertical wall and allow to dry.
2. Set cant in bitumen. Run all base field plies over cant a minimum of 2 inches (50 mm).
3. Install base flashing ply covering wall set in bitumen with 6 inches (152 mm) on to the base field ply and set in bitumen.
4. Then install thermoplastic cap field ply run over the base flashing ply in bitumen or foam adhesive.
5. Install the thermoplastic flashing ply in bitumen or foam over the base flashing ply, 9 inches (228 mm) on to the field of the roof.
6. Apply butyl tape to wall behind flashing. Secure termination bar through flashing, butyl tape and into wall. Alternatively use caulk to replace the butyl tape.
7. Secure counterflashing set on butyl tape above flashing at 8 inches (203 mm) o.c. and caulk top of counterflashing.

C. Exhaust Fan:
1. Minimum curb height is 8 inches (203 mm) above finished roof height. Prime vertical and allow to dry.
2. Set cant in bitumen. Run all base field plies over cant a minimum of 2 inches (50 mm).
3. Install base flashing ply covering wall set in bitumen with 6 inches (152 mm) on to the base field ply and set in bitumen.
4. Then install thermoplastic cap field ply run over the base flashing ply in bitumen or foam adhesive.
5. Install the thermoplastic flashing ply in bitumen or foam over the base flashing ply, 9 inches (228 mm) on to the field of the roof.
6. Install metal exhaust fan over the wood nailers and flashing to act as counterflashing. Fasten per manufacturer's recommendation.

D. Roof Drain:
1. Plug drain to prevent debris from entering plumbing.
2. Taper insulation to drain minimum of 24 inches (609 mm) from center of drain.
3. Run roof system base plies over drain. Cut out plies inside drain bowl.
4. Set lead/copper flashing (30 inch square minimum) in 1/4 inch bed of mastic. Run lead/copper into drain a minimum of 2 inches (50 mm). Prime lead/copper and allow to dry.
5. Install base flashing ply (40 inch square minimum) in bitumen.
6. Install thermoplastic cap ply (48 inch square minimum) in bitumen or foam adhesive.
7. Install clamping ring and assure that all plies are under the clamping ring.
8. Remove drain plug and install strainer.

3.6 CLEANING

A. Clean-up and remove daily from the site all wrappings, empty containers, paper, loose particles and other debris resulting from these operations.

B. Remove asphalt markings from finished surfaces.

C. Repair or replace defaced or disfigured finishes caused by Work of this section.
3.7 PROTECTION

A. Provide traffic ways, erect barriers, fences, guards, rails, enclosures, chutes and the like to protect personnel, roofs and structures, vehicles and utilities.

B. Protect exposed surfaces of finished walls with tarps to prevent damage.

C. Plywood for traffic ways required for material movement over existing roofs shall be not less than 5/8 inch (16 mm) thick.

D. In addition to the plywood listed above, an underlayment of minimum 1/2 inch (13 mm) recover board is required on new roofing.

E. Special permission shall be obtained from the Manufacturer before any traffic shall be permitted over new roofing.

3.8 FIELD QUALITY CONTROL

A. Inspection: Provide manufacturer's field observations with photo documentation at at intervals of a minimum of three (3) times per week when work is in progress. Provide a final inspection upon completion of the Work.
   1. Warranty shall be issued upon manufacturer's acceptance of the installation.
   2. Field observations shall be performed by a Sales Representative employed full-time by the manufacturer and whose primary job description is to assist, inspect and approve membrane installations for the manufacturer.
   3. Provide observation reports from the Sales Representative indicating procedures followed, weather conditions and any discrepancies found during inspection.
   4. Provide a final report from the Sales Representative, certifying that the roofing system has been satisfactorily installed according to the project specifications, approved details and good general roofing practice.

3.9 SCHEDULES

A. Base (Ply) Sheet:
   1. HPR Torch Base: 110 mil SBS (Styrene-Butadiene-Styrene) rubber modified roofing base sheet reinforced with a fiberglass scrim. Designed for torch applications with a burn-off backer that indicates when the material is hot enough to be installed.
      a. Tensile Strength, ASTM D 5147
         1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 210 lbf/in XD 210 lbf/in
         2) 50 mm/min. @ 23 +/- 2 deg. C MD 36.75 kN/m XD 36.75 kN/m
      b. Tear Strength, ASTM D 5147
         1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 300 lbf XD 300 lbf
         2) 50 mm/min. @ 23 +/- 2 deg. C MD 1,334 N XD 1,334 N
      c. Elongation at Maximum Tensile, ASTM D 5147
         1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD  6% XD  6%
         2) 50 mm/min. @ 23 +/- 2 deg. C MD  6% XD  6%
      d. Low Temperature Flexibility, ASTM D5147, Passes -30 deg. F (-34.4 deg. C)

B. Thermoplastic/Modified Cap (Ply) Sheet:
   1. StressPly IV Mineral: 195 mil SBS (Styrene-Butadiene-Styrene) mineral surfaced rubber modified roofing membrane with a dual fiberglass scrim. Designed for torch applications with a burn-off backer that indicates when the material is hot enough to be installed.
      a. Tensile Strength, ASTM D 5147

MODIFIED BITUMINOUS ROOFING 07550 - 12
1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 210 lbf/in XD 210 lbf/in
2) 50 mm/min. @ 23 +/- 2 deg. C MD 36.75 kN/m XD 36.75 kN/m
b. Tear Strength, ASTM D 5147
   1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 250 lbf XD 250 lbf
   2) 50 mm/min. @ 23 +/- 2 deg. C MD 1112 N XD 1112 N
c. Elongation at Maximum Tensile, ASTM D 5147
   1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 6% XD 6%
   2) 50 mm/min. @ 23 +/- 2 deg. C MD 6% XD 6%
d. Low Temperature Flexibility, ASTM D 5147, Passes -40 deg. F (-40 deg. C)

C. Flashing Base Ply:
1. HPR Torchbase: SBS modified, torch applied sheet material. ASTM D 6163, Type II.
   a. Tensile Strength, ASTM D 5147
      1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 210 lbf/in XD 210 lbf/in
      2) 50 mm/min. @ 23 +/- 2 deg. C MD 210 lbf/in XD 210 lbf/in
   b. Tear Strength, ASTM D 5147
      1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 200 lbf XD 200 lbf
      2) 50 mm/min. @ 23 +/- 2 deg. C MD 1334 N XD 1334 N
c. Elongation at Maximum Tensile, ASTM D 5147
   1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 6% XD 6%
   2) 50 mm/min@ 23 +/- 2 deg. C MD 6% XD 6%
d. Low Temperature Flexibility, ASTM D 5147:
   1) Passes -30 deg. F (-34 deg. C). Meets or Exceeds ASTM D 4601 Type II Performance Criteria.

D. Surfacing:
1. Flashing Cap (Ply) Sheet:
   a. StressPly IV Mineral: 195 mil SBS (Styrene-Butadiene-Styrene) mineral surfaced rubber modified roofing membrane with a dual fiberglass scrim. Designed for torch applications with a burn-off backer that indicates when the material is hot enough to be installed.
      1) Tensile Strength, ASTM D 5147
         a) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 210 lbf/in XD 210 lbf/in
         b) 50 mm/min. @ 23 +/- 2 deg. C MD 36.75 kN/m XD 36.75 kN/m
      2) Tear Strength, ASTM D 5147
         a) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 250 lbf XD 250 lbf
         b) 50 mm/min. @ 23 +/- 2 deg. C MD 1112 N XD 1112 N
      3) Elongation at Maximum Tensile, ASTM D 5147
         a) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 6% XD 6%
         b) 50 mm/min. @ 23 +/- 2 deg. C MD 6% XD 6%
      4) Low Temperature Flexibility, ASTM D 5147, Passes -40 deg. F (-40 deg. C)
   2. Surface Coatings:
      a. Surfacing:
         1) Garla-Brite: ASTM D 2824 aluminum coating non-fibered aluminum roof coating non-fibered aluminum roof coating having the following characteristics:
            a) Flash Point 103 deg. F (39 deg. C) min.
            b) Weight/Gallon 7.9 lbs./gal. (1.0 g/cm3)

END OF SECTION 07550
SECTION 07600 – FLASHING AND SHEET METAL WORK

PART 1 - GENERAL

1.1 SCOPE
   A. Furnish labor, materials, equipment and supervision necessary to provide and install all roof flashing, and all sheet metal work in accordance with the plans and as stated herein.

1.2 SUBMITTALS
   A. Samples: Submit samples of each type of sheet metal with labels attached.
   B. Shop drawings: Submit shop drawings for acceptance on all shop fabricated sheet metal work, showing details, material types, weights, gauges, joining, sealing and fastening.

1.3 STORAGE AND HANDLING
   A. Store materials off the ground and under cover. Handle materials to avoid damage and contamination. Do not store material on roof deck.

1.4 COORDINATION
   A. Inspect substrates for variance that would prevent satisfactory installation. Correct defects that would adversely affect application of materials such as projections, holes, oils and loose debris.
   B. Format and application of the flashings and sheet metal work with the application of roofing system, wood bases, protruding materials and roof accessories in such a manner that the complete installation is weathertight and in accord with guarantee requirements.

1.5 PROTECTION
   A. Protect building and adjacent surfaces from bitumen or adhesive spillage and repair or replace damage as directed by the County.

1.6 REFERENCE STANDARDS
   A. Fabricate and install work described herein in accord with the applicable standards described and illustrated in the publication entitled Architectural Sheet Metal Manual, First Edition – 1965, published by the Sheet Metal and Air Conditioning Contractors’ National Association, Inc.
PART 2 - MATERIALS

2.1 All non-exposed sheet metal flashing: Stainless steel, 24 Ga, type 316, 2B, ASTM A-240/A240M.

2.2 All exposed sheet metal flashing: 0.040" Aluminum Alloy 3105-H14 to match roof existing color.

2.3 Solder: - As recommended by the Sheet Metal Manufacturer.

2.4 Fastening Devices: - As recommended by the Sheet Metal Manufacturer.

2.5 Roofing Cement: - Plastic roofing cement in type I, summer grade.

PART 3 - EXECUTION

3.1 FABRICATION
   A. Fabricate sheet metal work in accord with accepted shop drawings and designated plate numbers. Employ skill mechanics working with equipment to provide workmanship of specified quality.
   B. Form sheet metal work with clean, sharp and uniform arise. Hem exposed edges.

3.2 INSTALLATION
   A. Install sheet metal work in accord with accepted shop drawings, true to line, with positive drainage.
   B. Isolate dissimilar materials to prevent electrolysis.
   C. Fasten sheet metal items as indicated or as necessary to provide rigid, secure installation free of warp or wind. Provide fastening.

END OF SECTION 07600
SECTION 07710 - ROOF PENETRATING FLASHINGS

PART 1 - GENERAL (NOT USED)

PART 2 - PRODUCTS

2.1 MATERIALS:

A. Metal: Stainless steel, 26 GA, type 304, 2B, ASTM A-240
B. Solder: ASTM B32, 50% tin - 50% lead; If lead-free solder is required, tin-silver, ASTM 96.5TS.
C. Foam Tape: Closed cell foam, PSA on one side, 1/4" or 3/8" x 1" wide, ASTMD-1056
D. Backer Rod: Open cell foam, 7/8", ASTM 1564
E. Sealant: Single part urethane, ASTM C920-79

2.2 FABRICATION:

A. Pitch Pans are not to be used in lieu of any other penetration flashing in these specifications and will require special approval by Architect to be used for unusual conditions.
   1. If required, fabricate stainless steel, using 7-1/2 inch stock x girth required, forming a hemmed 3 inch high side and a 4 inch flashing flange. Provide 2 inch clearance from protrusion. If pitch pan can be slipped over penetration, shop solder four corners 4-1/2 inches with radial corners in place. If pitch pan cannot be slipped over penetration, wrap pitch pan around penetration, and solder corners and vertical seam.

B. Fabrication of flashings for pipes, conduits and other round items penetrating, resting on or anchored to roof, which allows a tubular flashing to be slipped over.
   1. Form tubular flashing sleeve no less than 9 inches high and of proper diameter to provide 1/8 inch minimum - 1/4 inch maximum clearance from pipe or conduit.
   2. Fabricate square flashing plate to a size 7-1/2 inch larger than protrusion. Punch hole of appropriate size in center and extrude surrounding material upward 1/4 inch, providing a continuous vertical soldering flange and solder 9 inch high tubular flashing sleeve. Cut 1" minimum radius on flashing plate corners.
   3. Fabricate counter flashing 5 inches high with a diameter 1/2 inch larger than pipe or conduit.
   4. Provide a conical sealant cover, sloped outward and downward at 30 degrees to 45 degrees from the horizontal plane with an inside diameter equal to pipe or conduit size and an outside diameter 1 to 2 inches larger.
   5. Shop solder all seams watertight.
   6. Provide Model P/S or C/S as manufactured by SBC Industries, North Miami, FL, 800-228-2580. Include standard accessory sealant cover.

C. Fabrication of flashings for connected pipes, conduits and the round items not allowing a tubular flashing to be slipped over.
   1. Form semi-cylindrical tubular flashing sleeves (180 degree) not less than 9 inches high, tightly seam intersecting halves to mate snugly. Provide a split flashing plate with radial corners and being formed upward to provide a continuous soldering flange for semi-cylindrical sleeve engagement. Size each unit to allow for vibration and thermal movement of pipe or conduit with 1/8 inch minimum x 1/4 inch maximum.
   2. Form cylindrical counter flashing 5 inches high with seamed edge to a diameter 1/4 inch larger than 9 inch high sleeve.
   3. Provide conical sealant cover, sloped outward and downward at 30 degrees to 45 degrees from a horizontal plane, with an inside diameter equal to pipe or conduit size and an outside diameter 2 inches larger.
   4. Provide Model P/D or C/D as manufactured by SBC Industries, North Miami, FL. Include standard accessory sealant cover.

D. Fabrication of flashings for angle irons, "H" beams, channels and square tubing.
1. Form a 6 inch high two-piece angular configuration similar to penetration, but allowing 3/16 inch minimum to 3/8 inch maximum clearance in any direction. Fabricate flashing flanges in two pieces and shop solder to 6 inch angular stacks. Provide an umbrella type counter flashing conforming to protrusion. Extend 3/4 inch at 45 degree outward from angular stack flashing.


PART 3 - EXECUTION

3.1 INSTALLATION

A. Installation of flashing for pipes, conduits and other round items penetrating, resting on, or anchored to roofing.
   1. Slide flashing unit over penetration and firmly embed flashing plate in full bed of mastic.
   2. Counter flashing and sealant cover: Using a solvent with a rapid evaporation rate and leaving no residue, clean area of pipe directly above flashing. Wrap a single layer of 1/4" to 3/8" x 1 inch wide closed cell tape around pipe, 1/4 inch above top of base sleeve. Wrap cap flashing around allowing top to extend 1/4 inch above top of tape. Apply sealant into channel at top and tool for positive runoff. Apply conical sealant cover directly above sealant.

B. Installation of flashing for connected pipes, conduits and other round items penetrating roofing or resting on roof not allowing a tubular flashing to be slipped over.
   1. Base sleeves: Mate shop fabricated half sections together around pipe and solder vertical and horizontal seams watertight. Embed flashing flange in full bed of mastic.
   2. Counter flashing and conical sealant cover: Using a solvent with a rapid evaporation rate and leaving no residue, clean area of pipe directly above flashing. Wrap a single layer of 1/4" to 3/8" x 1 inch wide closed cell foam tape around pipe 1/4 inch above top of base sleeve. Install cap flashing. Solder vertical seam. Apply sealant into channel and tool for positive runoff. Apply conical sealant cover directly above sealant.

C. Installation of flashing for angle, H-beams, channels and square tubing.
   1. Around the protrusion snap or slide nesting flashing sections together, solder all seams and neutralize flux. At area of clearance between protrusion and top of stack flashing, insert backer rod of appropriate size 3/8 inch below top of stack flashing. Apply a liberal amount of sealant and tool for positive drainage. Install sealant cover directly above stack flashing in wet sealant.
   2. Note: Prime and strip flash flange to roof per membrane manufacturer's specifications.

END OF SECTION
SECTION 07900 - JOINT SEALERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

1.2 SUMMARY

A. This Section includes joint sealants for the following applications, including those specified by reference to this Section:
   1. Exterior joints in the following vertical surfaces and horizontal non-traffic surfaces:
      b. Joints between plant-precast architectural concrete units.
      c. Control and expansion joints in unit masonry.
      d. Joints between different materials listed above.
      e. Perimeter joints between materials listed above and frames of doors, windows, and louvers.
      f. Control and expansion joints in soffits and other overhead surfaces.

1.3 PERFORMANCE REQUIREMENTS

A. Provide elastomeric joint sealants that establish and maintain watertight and airtight continuous joint seals without staining or deteriorating joint substrates.

1.4 QUALITY ASSURANCE:

A. Installer Qualifications: Engage an Installer who has successfully completed within the last 3 years at least 3 joint sealer applications similar in type and size to that of this project and who will assign mechanics from these earlier applications to this project, of which one will serve as lead mechanic.

B. Single Source Responsibility for Joint Sealer Materials: Obtain joint sealer materials from a single manufacturer for each different product required.

C. Pre-construction Joint Sealer-Substrate Tests: Submit substrate materials representative of actual joint surfaces to be sealed to manufacturer of joint sealer products for laboratory testing of sealants for adhesion to primed and unprimed substrates and for compatibility with secondary seals, if required, as indicated below:
   1. Use test methods standard with manufacturer to determine if priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealers to joint substrates under environmental conditions that will exist during actual installation.
   2. Testing will not be required when joint sealer manufacturer is able to submit joint preparation data required above which is acceptable to Architect and is based on previous testing of current sealant products for adhesion to, and compatibility with joint substrates matching those submitted.

1.5 SUBMITTALS:
A. Product Data: Submit manufacturer's technical data for each joint sealer product required, including instructions for joint preparation and joint sealer application.

B. LEED Data: Low VOC material

C. Samples for Initial Selection Purposes: Submit manufacturer's standard bead samples consisting of strips of actual products showing full range of colors available, for each product exposed to view.

D. Samples for Verification Purposes: Submit samples of each type and color of joint sealer required. Install joint sealer samples in 1/2” wide joints formed between two 6” long strips of material matching the appearance of exposed surfaces adjacent to joint sealers in the work.

E. Test Reports: Submit the following test reports:
   1. Preconstruction joint sealer-substrate test results including recommendations of joint sealer manufacturer for joint preparation and application of joint sealers applicable to project conditions.
   2. Certified test reports for elastomeric sealants evidencing compliance with requirements specified based on comprehensive testing of current product formulations within a 24-month period preceding date of submission of test reports to Architect. Include test results for aged performances including hardness, stain resistance, adhesion and cohesion under cyclic movement, low-temperature flexibility, modulus of elasticity at 100% strain, effects of heat aging, and effects of accelerated weathering.
   3. Certified test reports for joint sealers of type indicated below evidencing compliance with specified requirements:
      a. Foam-type filler-sealants
      b. Gaskets
      c. Pre-Compressed, Impregnated Foam Seal

F. Certificates: Submit certificates from manufacturers of joint sealers attesting that their products comply with specification requirements and are suitable for the use indicated.

1.6 DELIVERY, STORAGE, AND HANDLING:

A. Deliver materials to project site in original unopened containers or bundles with labels informing about manufacturer, product name and designation, color, expiration period for use, pot life, curing time and mixing instructions for multi-component materials.

B. Store and handle materials to prevent their deterioration or damage due to moisture, temperature changes, contaminants, or other causes.

1.7 PROJECT CONDITIONS:

A. Environmental Conditions: Do not proceed with installation of joint sealers under the following conditions:
   1. When ambient and substrate temperature conditions are outside the limits permitted by joint sealer manufacturers.
   2. When joint substrates are wet due to rain, condensation or other causes.

B. Joint Width Conditions: Do not proceed with installation of joint sealers when joint widths are less than allowed by joint sealer manufacturer for application indicated.
1.8 WARRANTY

A. Special Installer's Warranty: Installer's standard form in which Installer agrees to repair or replace elastomeric joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
   1. Warranty Period: Three years from date of Substantial Completion.

B. Special Manufacturer's Warranty: Manufacturer's standard form in which elastomeric sealant manufacturer agrees to furnish elastomeric joint sealants to repair or replace those that do not comply with performance and other requirements specified in this Section within specified warranty period.
   1. Warranty Period: Ten years from date of Substantial Completion.

C. Special warranties specified in this Article exclude deterioration or failure of elastomeric joint sealants from the following:
   1. Movement of the structure resulting in stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression caused by structural settlement or errors attributable to design or construction.
   2. Disintegration of joint substrates from natural causes exceeding design specifications.
   3. Mechanical damage caused by individuals, tools, or other outside agents.
   4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL:

A. Compatibility: Provide joint sealers, joint fillers and other related materials that are compatible with, and will adhered to, one another and with joint substrates under conditions of service and application, as demonstrated by testing and field experience.

B. Compatibility: Provide joint sealers, joint fillers and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by testing and field experience.

C. Exterior Single-Component Urethane-Base Sealant:
   1. Products:
      a. Dymonic 100: ASTM C 920 Type S, Grade NS, Class 50, Use NT, T, M, A, O, I (Basis of Design).
      b. Dymonic FC: ASTM C 920 Type S, Grade NS, Class 35, Use NT, M, A and O
      c. Or Approved Equal
   2. Type and Grade: M (multi component) and NS (nonsag).
   3. Class: 50.
   4. Federal Specifications TT-S-227 compliant
   5. Provide primer and building paint on all exposed joints.

D. Interior Single-Component Acoustical Sealant:
   1. Acoustical Sealant for Exposed and Concealed Joint: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834 and the following:
   2. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.
   3. Products:
      a. Pecora Corporation; AC-20 FTR Acoustical and Insulation Sealant.
b. Tremco Corporation; Tremflex 834 Siliconized Interior Latex Sealant


d. Or Approved Equal

E. All sealants shall be delivered to the job site in sealed containers bearing the manufacturer's name, mixed, stored, handled and applied in strict accordance with the manufacturer's detailed printed specifications, recommendations and instructions, copies of which shall be submitted with samples for approval and made available to the Architect at all times on the job site.

F. Manufacturer's label shall indicate the date of manufacture of sealants, or manufacturer shall otherwise attest to the date of manufacture. The period of time lapsed for polysulfide shall be not longer than six (6) months, and three (3) months for polyurethane, from the date of manufacture to the date of usage on the job.

G. Primers where required shall be as recommended by the sealant manufacturer.

H. The color of the sealants shall be as selected by the Architect from the manufacturer's standard range of colors.

I. Bond-breakers where required shall be as recommended by the sealant manufacturer in writing to the Architect.

J. Joint filler material in back of the sealants shall be a closed cell polyethylene or closed cell neoprene conforming to the requirements specified hereinafter.

K. Traffic Joints: (Subject to Vehicular or Pedestrian Traffic) Sealant at traffic joints shall be two-part polyurethane-base sealant of self-leveling consistency, meeting the following standards:

1. Allowable shrinkage when tested according to Federal Specifications TT-S-227, sealant shall have maximum allowable weight loss of (4) percent.

2. Guarantee as herein before specified.

L. Filler material for traffic joints shall be a non-impregnated pre-compressed, impregnated foam seals, supporting type, compressible, resilient, free from tar, asphalt, oil, and other foreign substances. Filler shape shall be such that sealant in joint is fully supported against puncture or pressure, but of design to prevent sealant from being forced out of joint by contraction. Filler shall have characteristics of not bonding with sealant, or approved release material, shall be employed at surface of filler. Filler shall be at least 30% wider than width of joint measured in field to which it is applied. Compression on such installed filler shall be sufficient so as to allow no displacement.

PART 3 - EXECUTION

3.1 INSPECTION:

A. Require Installer to inspect joints indicated to receive joint sealers for compliance with requirements for joint configuration, installation tolerances and other conditions affecting joint sealer performance. Obtain Installer's written report listing any conditions detrimental to performance of joint sealer work. Do not allow joint sealer work to proceed until unsatisfactory conditions have been corrected.

3.2 PREPARATION:
A. Pre-Installation Meeting: At Contractor's direction, Installer, joint sealer manufacturers' representatives, and other trades whose work affects installation of joint sealers shall meet at project site to review procedures and time schedule proposed for installation of joint sealers which is coordinated with other, related work.

B. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealers to comply with recommendations of joint sealer manufacturers and the following requirements:

1. Remove all foreign material from joint substrates which could interfere with adhesion of joint sealer, including dust; paints, except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer, oil, grease, waterproofing, water repellents, water, surface dirt and frost.
2. Clean concrete, masonry, unglazed surfaces of ceramic tile and similar porous joint substrate surfaces, by brushing, grinding, blast cleaning, mechanical abrading, acid washing or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealers. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air.
3. Remove laitance and form release agents from concrete.
4. Clean metal, glass, porcelain enamel, glazed surfaces of ceramic tile and other non-porous surfaces by chemical cleaners or other means which are not harmful to substrates or leave residues capable of interfering with adhesion of joint sealers.

C. Joint Priming: Prime joint substrates where indicated or where recommended by joint sealer manufacturer based on preconstruction joint sealer-substrate tests or prior experience. Apply primer to comply with joint sealer manufacturer's recommendations. Confine primers to areas of joint sealer bond; do not allow spillage or migration onto adjoining surfaces.

D. Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces which otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALERS:

A. General: Comply with joint sealer manufacturers' printed installation instructions applicable to products and applications indicated, except where more stringent requirements apply.

B. Elastomeric Sealant Installation Standard: Comply with recommendations of ASTM C 962 for use of joint sealants as applicable to materials, applications and conditions indicated.


D. Latex Sealant Installation Standard: Comply with requirements of ASTM C 790 for use of latex sealants.

E. Acoustical Sealant Application Standard: Comply with recommendations of ASTM C 919 for use of joint sealants in acoustical applications as applicable to materials, applications and conditions indicated.

F. Installation of Sealant Backings: Install sealant backings to comply with the following requirements:

1. Install joint-fillers of type indicated to provide support of sealants during application and at position required to produce the cross-sectional shapes and depths of installed sealants relative to joint widths which allow optimum sealant movement capability.
   a. Do not leave gaps between ends of joint-fillers.
   b. Do not stretch, twist, puncture or tear joint-fillers.
c. Remove absorbent joint-fillers which have become wet prior to sealant application and replace with dry material.

2. Install bond breaker tape between sealants and joint-fillers, compression seals or back of joints where required to prevent third-side adhesion of sealant to back of joint.

3. Install compressible seals serving as sealant backings to comply with requirements indicated above for joint fillers.

G. Installation of Sealants: Install sealants by proven techniques that result in sealants directly contacting and fully wetting joint substrates, completely filling recesses provided for each joint configuration and providing uniform, cross-sectional shapes and depths relative to joint widths which allow optimum sealant movement capability.

H. Tooling of Non-Sag Sealants: Immediately after sealant application and prior to time skinning or curing begins, tool sealants to form smooth, uniform beads of configuration indicated, to eliminate air pockets and to ensure contact and adhesion of sealant with sides of joint. Remove excess sealants from surfaces adjacent to joint. Do not use tooling agents which discolor sealants or adjacent surfaces or are not approved by sealant manufacturer.

1. Concave joint configuration per Figure 6A in ASTM C 962, unless otherwise indicated.
2. Flush joint configuration per Figure 6B in ASTM C 962, where indicated.
3. Use masking tape to protect adjacent surfaces of recessed tooled joints.
4. Recessed joint configuration per Figure 6C in ASTM C 962, of recess depth and at locations indicated.

I. Installation of Pre-Formed Hollow Neoprene Gaskets: Install gaskets, with minimum number of end joints, in joint recesses with edges free of spalls and sides straight and parallel, both within tolerances specified by gasket manufacturer. Apply manufacturer's recommended adhesive to joint substrates immediately prior to installing gaskets. For straight sections provide gaskets in continuous lengths; where changes in direction occur, adhesively splice gasket together to provide watertight joint. Recess gasket below adjoining joint surfaces by 1/8" to 1/4".

J. Installation of Fire-Stopping Sealant: Install sealant, including forming, packing and other accessory materials to fill openings around mechanical and electrical services penetrating floors and walls to provide fire-stops with fire resistance ratings indicated for floor or wall assembly in which penetration occurs.

3.4 PROTECTION AND CLEANING:

A. Protect joint sealers during and after curing period from contact with contaminating substances or from damage resulting from construction operations or other causes so that they are without deterioration or damage at time of substantial completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealers immediately and reseal joints with new materials to produce joint sealer installations with repaired areas indistinguishable from original work.

B. Clean off excess sealants or sealant smears adjacent to joints as work progresses by methods and with cleaning materials approved by manufacturers of joint sealers and of products in which joints occur.

END OF SECTION 07900