FILE COPY

$1,176,716.00
ORIGINAL

BID OF BACHMANN CONSTRUCTION CO., INC.

2007

PROPOSAL, CONTRACT, BOND AND SPECIFICATIONS

FOR

BREESE STEVENS FIELD RESTORATION - 2007

CB60-58401-801565-00-0000000-6030300

CONTRACT NO. 6044

IN

MADISON, DANE COUNTY, WISCONSIN

AWARDED BY THE COMMON COUNCIL
MADISON, WISCONSIN ON SEPTEMBER 4, 2007

PLEASE RETURN PLANS AND SPECIFICATIONS TO:

CITY ENGINEERING DIVISION
1602 EMIL STREET
MADISON, WISCONSIN 53713

CONSTRUCTIONS DOCUMENTS PACKAGE

Renovation of

BREESE STEVENS ATHLETIC FIELD

917 East Mifflin Street

Madison, Wisconsin

IAI Project No. 0438

PROJECT MANUAL VOLUME 1: DIVISIONS 01-33

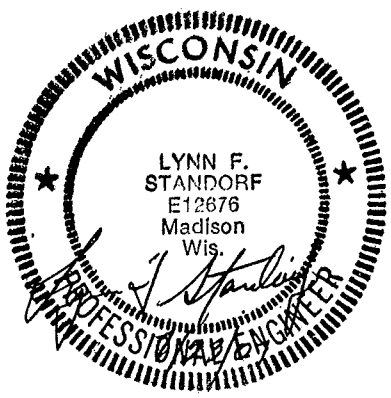
Prepared by

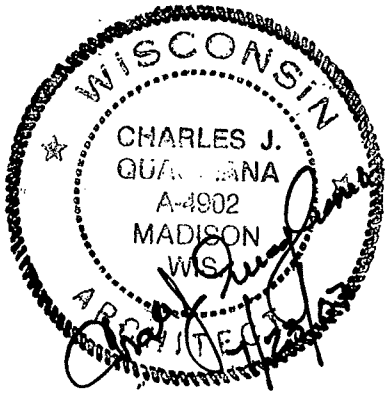
Isthmus Architecture, Inc.

613 Williamson Street, Suite 203

Madison, WI 53703

(608) 294-0206





BREESE STEVENS FIELD RESTORATION - 2007

CONTRACT NO. 6044

INDEX

This Proposal, and Agreement have
been prepared by:

CITY ENGINEERING DIVISION
CITY OF MADISON
MADISON, DANE COUNTY, WISCONSIN

_____
Larry D. Nelson, City Engineer

REQUEST FOR BID FOR PUBLIC WORKS CONSTRUCTION
CITY OF MADISON, WISCONSIN

CONTRACT NO.	**PROJECT NAME:**
6044	**BREESE STEVENS FIELD RESTORATION - 2007** **SBE GOAL 8%**

NOTE: $10.00 NON-REFUNDABLE MAILING FEE PER SET

Schedule	**Time, Date, and Place**
Plans and Specifications Are Available	1602 Emil Street, Madison, WI 53713
Prequalifications Bidders who have not been prequalified by the City Engineer and Affirmative Action Director for the period of **January 31, 2007 to January 31, 2008** Forms are available at the same location. Contact Janet Pien, 608-266-4620.	**1:00 P.M., AUGUST 10, 2007**, Room 115, City-County Building, Madison, WI 53703 (Attention: Janet Pien) Postmark is not applicable.
Pre-Bid Meeting Representatives of the Affirmative Action Department will be present to discuss the Small Business Enterprise requirements.	**1:00 P.M., AUGUST 3, 2007 at 1602 EMIL STREET**, Madison, WI 53713
5% Bid Bond *or Certificate of Annual Bid Bond and conformance with Prevailing Wage Rate is Required Prevailing Wages Rates (White Sheet Work) Required	
Submittal of Bid and Small Business Enterprise Report in sealed separate envelopes	**1:00 P.M., AUGUST 10, 2007** at 1602 Emil Street, Madison, WI.
Bid Opening	**1:30 P.M., AUGUST 17, 2007** at 1602 Emil Street, Madison, WI

Pub: TCT: **JULY 20, 27, AND AUGUST 3, 2007**

SECTION B: INSTRUCTIONS TO BIDDERS

The City of Madison Standard Specifications for Public Works Construction - 2007 Edition, as supplemented and amended from time to time, forms a part of these contract documents as if attached hereto.

These standard specifications are available on request from the City Engineer, City Engineering Division, Room 115, City-County Building, 210 Martin Luther King Jr., Blvd., Madison, WI 53710.

The Contractor shall review these Specifications prior to preparation of proposals for the work to be done under this contract, with specific attention to Article 102 **"BIDDING REQUIREMENTS AND CONDITIONS"** and Article 103 **"AWARD AND EXECUTION OF THE CONTRACT."** For the convenience of the bidder, below are highlights of three subsections of the specifications.

Section 102.1: Pre-Qualification of Bidders

In accordance with Wisconsin State Statutes 66.0901 (2) and (3), all bidders must submit to the Board of Public Works proof of responsibility on forms furnished by the City. The City requires that all bidders be qualified on an annual basis.

Bidders must present satisfactory evidence that they have been regularly engaged in the type of work specified herein and they are fully prepared with necessary capital, materials, machinery and supervisory personnel to conduct the work to be contracted for to the satisfaction of the City. All bidders must be pre-qualified by the Board of Public Works for the type of construction on which they are bidding.

In accordance with Section 3.58(9)(a)l. of the Madison General Ordinances, all bidders shall submit in writing to the Affirmative Action Officer of the City of Madison, a Certificate of Compliance or an Affirmative Action Program at the same time or prior to the submission of the proof of responsibility forms.

Section 102.4: Proposals

No bid will be accepted that does not contain an adequate or reasonable price for each and every item named in the Schedule of Unit Prices.

A lump sum bid for the work in accordance with the plans and specifications is required. The lump sum bid musts be the same as the total amounts bid for the various items and it shall be inserted in the space provided.

All papers bound with or attached to the proposal form are considered a part thereof and must not be detached or altered when the proposal is submitted. The plans, specifications and other documents designated in the proposal form will be considered a part of the proposal whether attached or not.

A proposal submitted by an individual shall be signed by the bidder or by a duly authorized agent. A proposal submitted by a partnership shall be signed by a member/partner or by a duly authorized agent thereof. A proposal submitted by a corporation shall be signed by an authorized officer or duly authorized registered agent of such corporation, and the proposal shall show the name of the State under the laws of which such corporation was chartered. The required signatures shall in all cases appear in the space provided therefore on the proposal.

Each proposal shall be placed, together with the proposal guaranty, in a sealed envelope, so marked as to indicate name of project, the contract number or option to which it applies, and the name and address of

the Contractor. Proposals will be received at the place and until the hour on the date designated in the advertisement. When sent by mail, the sealed proposal marked as indicated above shall be enclosed in an additional envelope. Proposals sent by mail, submitted in person or otherwise delivered must be in the hands of the official conducting the letting by the hour on the date designated in the advertisement. Proposals received after the date designated will be returned to the bidder unopened.

The Bidder shall execute form ERD-7777 (R.1/97), a part of these proposal pages and submit same with the bidder's proposal, if applicable. REFER TO PROPOSAL SECTION.

Section 102.5: Bid Deposit (Proposal Guaranty)

No proposal shall be considered unless either (i) it is accompanied by a bid deposit of the character and amount described in the Advertisement for Bids or (ii) an annual bid bond in an amount and form acceptable to the City of Madison has been previously submitted.

Bid deposits of unsuccessful bidders shall be returned following the award of the contract by the Common Council. Bid deposit of the successful bidders shall be returned within forty-eight (48) hours following execution of the contract and bond as required.

Bidders for this Contract(s) must be Pre-Qualified for at least one of the following type(s) of construction denoted by an ☒

Building Demolition

101 ☐ Asbestos Removal

110 ☐ Building Demolition

Street, Utility and Site Construction

201 ☐ Asphalt Paving
204 ☐ Blasting
208 ☐ Concrete Paving
212 ☐ Con. Sidewalk/Curb & Gutter/Misc. Concrete Work
216 ☐ Fencing
224 ☐ Grading and Earthwork
225 ☐ Landscaping, Maintenance
228 ☐ Landscaping, Site and Street
232 ☐ Pavement Sealcoating and Crack Sealing
236 ☐ Petroleum Above/Below Ground Storage Tank Removal/Installation
240 ☐ Retaining Walls, Precast Modular Units
245 ☐ Retaining Walls, Reinforced concrete
250 ☐ Sanitary, Storm Sewer & Water Main Const.
255 ☐ Sewer Lining
260 ☐ Soil Borings with Public ROW
265 ☐ Street Construction
270 ☐ Street Lighting
285 ☐ Traffic Control During Construction
275 ☐ Traffic Signals
280 ☐ Traffic Signing and Marking
299 ☐ Other_____

Bridge Construction

301 ☐ Bridge Construction and/or Repair

Building Construction

401 ☐ Carpet Installation
405 ☐ Electrical
410 ☐ Elevator
415 ☐ General Building Construction $250,000 to $1,500,000
420 ☐ General Building Construction, Equal/Less than $250,000
425 ☑ General Building Construction, Over $1,500,000
430 ☐ Heating, Ventilating and Air Conditioning (HVAC)
435 ☐ Masonry
440 ☐ Painting
445 ☐ Plumbing
450 ☐ Pump Repair
455 ☐ Pump Systems
460 ☐ Roofing
465 ☐ Soil/Groundwater Remediation
470 ☐ Water Supply Elevated Tanks
475 ☐ Other Supply Wells
499 ☐ Other_____

State of Wisconsin Certifications

1 ☐ Class 5 Blaster - Blasting Operations and Activities 2500 feet and closer to inhabited buildings for quarries, open pits and road cuts.
2 ☐ Class 6 Blaster - Blasting Operations and Activities 2500 feet and closer to inhabited buildings for trenches, site excavations, basements, underwater demolition, underground excavations, or structures 15 feet or less in height.
3 ☐ Class 7 Blaster - Blasting Operations and Activities for structures greater than 15 ' in height, bridges, towers, and any of the objects or purposes listed as "Class 5 Blaster or Class 6 Blaster".
4 ☐ Petroleum Above/Below Ground Storage Tank Removal and Installation (Attach copies of State Certifications.)
5 ☐ Other_____

SECTION C: SBE

Instructions to Bidders
City of Madison
SBE Program Information

2 Small Business Enterprise (SBE) Program Information

2.1 Policy and Goal

The City of Madison reaffirms its policy of nondiscrimination in the conduct of City business by maintaining a procurement process which remains open to all who have the potential and ability to sell goods and services to the City. It is the policy of the City of Madison to allow Small Business Enterprises (SBE) maximum feasible opportunity to participate in City of Madison contracting.

Please refer to the "ADVERTISEMENT FOR BIDS" for the goal for the utilization of SBEs on this project. SBEs may participate as subcontractors, vendors and/or suppliers, which provide a commercially useful function.

A bidder which achieves or exceeds the SBE goal will be in compliance with the SBE requirements of this project. In the event that the bidder is unable to achieve the SBE goal, the bidder must demonstrate that a good faith effort to do so was made. Failure to either achieve the goal or demonstrate a good faith effort to do so will be grounds for the bidder being deemed a nonresponsible contractor ineligible for award of this contract.

2.2 Contract Compliance

Questions concerning the SBE Program shall be directed to the Contract Compliance Officer of the City of Madison Affirmative Action Department, Madison Municipal Building, Suite 130, 215 Martin Luther King, Jr. Blvd., Madison, WI 53710; telephone (608) 266-4082.

2.3 Certification of SBE by City of Madison

The Affirmative Action Department maintains a directory of SBEs which are currently certified as such by the City of Madison. Contact the Contract Compliance Officer as indicated in Section 2.2 to receive a copy of the SBE Directory or you may access the SBE Directory online at www.cityofmadison.com/dcr/aaTBDir.cfm.

All contractors, subcontractors, vendors and suppliers seeking SBE status must complete and submit **Schedule C, SBE Certification Application** to the City of Madison Affirmative Action Department by the time and date established for receipt of bids. A copy of Schedule C is available by contacting the Contract Compliance Officer at the address and telephone indicated in Section 1.2. Submittal of Schedule C by the time specified does not guarantee that the applicant will be certified as a SBE eligible to be utilized towards meeting the SBE goal for this project.

2.4 Small Business Enterprise Compliance Report

2.4.1 Good Faith Efforts

Bidders shall take all necessary affirmative steps to assure that SBEs are utilized when possible and that the established SBE goal for this project is achieved. When a bidder is unable to achieve the established SBE goal, the bidder must demonstrate that a good faith effort to do so was made. Such a good faith effort should include the following:

2.4.1.1 Attendance at the pre-bid meeting.
2.4.1.2 Using the City of Madison's directory of certified SBEs to identify SBEs from which to solicit bids.
2.4.1.3 Assuring that SBEs are solicited whenever they are potential sources.
2.4.1.4 Referring prospective SBEs to the City of Madison Affirmative Action Department for certification.
2.4.1.5 Dividing total project requirements into smaller tasks and/or quantities, where economically feasible, to permit maximum feasible SBE participation.
2.4.1.6 Establishing delivery schedules, where requirements permit, which will encourage participation by SBEs.
2.4.1.7 Providing SBEs with specific information regarding the work to be performed.
2.4.1.8 Contacting SBEs in advance of the deadline to allow such businesses sufficient time to prepare a bid and engage in negotiation.
2.4.1.9 Negotiating directly with SBEs including those which volunteer a bid.
2.4.1.10 Utilizing the bid of a qualified and competent SBE when the bid of such a business is deemed reasonable, although not necessarily low.

2.4.2 Reporting SBE Utilization and Good Faith Efforts

The Small Business Enterprise Compliance Report is to be submitted by the bidder in a separate sealed envelope marked: **"ENVELOPE 2 - SBE COMPLIANCE REPORT."** This report is due by the specified bid closing time and date. Bids submitted without a completed SBE Compliance Report as outlined below will be deemed nonresponsive and the bidder ineligible for award of this contract.

2.4.2.1 If the Bidder meets or exceeds the goal established for SBE utilization, the Small Business Enterprise Compliance Report shall consist of the following:

2.4.2.1.1 **Cover Page,** Page SBE-1; and
2.4.2.1.2 **Summary Page,** SBE-2.

2.4.2.2 If the bidder does not meet the goal established for SBE utilization, the Small Business Enterprise Compliance Report shall consist of the following:

2.4.2.2.1 **Cover Page,** Page SBE-1;
2.4.2.2.2 **Summary Page,** SBE-2; and

2.4.2.2.3 **SBE Contact Report,** SBE-3 and SBE-4. (A separate Contact Report must be completed for each SBE which is not utilized.)

2.5 Appeal Procedure

A bidder which does not achieve the established goal and is deemed nonresponsible for failure to demonstrate a good faith effort to achieve such goal and subsequently denied eligibility for award of contract may, within 72 hours of receiving such notification, appeal that decision to a special appeals committee composed of three (3) members of the Affirmative Action Commission, three (3) members of the Board of Public Works and a seventh member appointed by the Mayor. All appeals must be made in writing to the Director of Public Works and received within 72 hours of City of Madison's notice. Postmark not applicable.

A bidder which is deemed nonresponsive may not appeal the City's decision to deny eligibility for award of contract.

2.6 SBE Requirements After Award of the Contract

The successful bidder shall identify SBE subcontractors, suppliers and vendors on the subcontractor list in accordance with the specifications. The Contractor shall submit a detailed explanation of any variances between the listing of SBE subcontractors, vendors and/or suppliers on the subcontractor list and the Contractor's SBE Compliance Report for SBE participation. Failure to provide a satisfactory explanation in these variances may result in the City invoking the sanctions contained in Paragraph 5(g) of the Agreement contained within this project manual.

No change in SBE subcontractors, vendors and/or suppliers from those SBEs indicated in the SBE Compliance Report will be allowed without prior approval from the City of Madison Affirmative Action Department. The contractor shall submit in writing to the City of Madison Affirmative Action Department a request to change any SBE citing specific reasons which necessitate such a change. The Affirmative Action Department will use a general test of reasonableness in approving or rejecting the contractor's request for change. If the request is approved, the Contractor will make every effort to utilize another SBE if available.

The City will monitor the project to ensure that the actual percentage commitment to SBE firms is carried out.

2.7 SBE Definition and Eligibility Guidelines

A Small Business Enterprise is a business concern awarded certification by the City of Madison. For the purposes of this program a Small Business Enterprise is defined as:

A. An independent business operated under a single management. The business may not be a subsidiary of any other business and the stock or ownership may not be held by any individual or any business operating in the same or a similar field. In determining whether an entity qualifies as a SBE, the City shall consider all factors relevant to being an independent business including, but not limited to, the date the business was established, adequacy of its resources for the work in which it proposes to involve itself, the degree to which financial, equipment

leasing and other relationships exist with other ineligible firms in the same or similar lines of work. SBE owner(s) shall enjoy the customary incidents of ownership and shall share in the risks and profits commensurate with their enjoyment interests, as demonstrated by an examination of the substance rather than form or arrangements that may be reflected in its ownership documents.

B. A business with annual gross receipts of less than $750,000 when averaged over the past three years period;

Firm and/or individuals that submit fraudulent documents/testimony may be barred from doing business with the City and/or forfeit existing contracts.

SBE certification is valid for one (1) year unless challenged.

BREESE STEVENS FIELD RESTORATION - 2007

CONTRACT NO. 6044

Small Business Enterprise Compliance Report

Cover Sheet

This information MUST be submitted in a separate sealed envelope marked "ENVELOPE NO. 2 - SBE COMPLIANCE REPORT."

Prime Bidder Information:

Company:_____

Address:_____

Telephone Number:_____

Contact Person/Title:_____

Prime Bidder Certification:

I, _____, _____ of
Name Title

_____ certify that the information
Company

contained in this SBE Compliance Report is true and correct to the best of my knowledge and belief.

_____ _____
Witness' Signature Bidder's Signature

_____
Date

BREESE STEVENS FIELD RESTORATION - 2007

CONTRACT NO. 6044

Small Business Enterprise Compliance Report

Summary Sheet

This information MUST be submitted in a separate sealed envelope marked "ENVELOPE NO. 2 - SBE COMPLIANCE REPORT."

Name(s) of SBEs Utilized	% of Total Bid Amount

Total Percentage of SBE Utilization:_____%.

BREESE STEVENS FIELD RESTORATION - 2007

CONTRACT NO. 6044

Small Business Enterprise Compliance Report

SBE Contact Report

This information MUST be submitted in a separate sealed envelope marked "ENVELOPE NO. 2 - SBE COMPLIANCE REPORT."

Submit separate copy of this form for each SBE which you are not able to utilize towards meeting the SBE goal for this project. Attach separate sheets if necessary.

SBE Information:

Company:_____

Address:_____

Telephone Number:_____

Contact Person/Title:_____

1. Outline below all efforts to solicit a bid from the above SBE. Include date, means of contact, who from your company made this contact and the result.

_____

_____

_____

2. Describe the information provided to the aforementioned SBE regarding the scope of work for which he/she was to provide a bid?

_____

_____

_____

Is this the same scope of work on which the subcontractor you intend to utilize based his/her bid?

☐ Yes ☐ No

3. Did this SBE submit a bid? ☐ Yes ☐ No

4. If you responded "Yes" to Question 3, please check the items below which apply and provide the requested detail. If you responded "No" to Question 3, please skip ahead to Question 5.

The SBE listed above is unavailable for work on this project for the following reasons. Provide specific detail for this conclusion.

The SBE listed above is unqualified for work on this project. Provide specific details for this conclusion.

The SBE listed above provided a price that was unreasonable. Provide specific detail for this conclusion including the SBE's price and the price of the subcontractor you intend to utilize.

Other; please specify reason(s) other than listed above which made it impossible for you to utilize this SBE on this project.

5. Describe any other good faith efforts:

SECTION D: SPECIAL PROVISIONS

BREESE STEVENS FIELD RESTORATION - 2007

CONTRACT NO. 6044

ACCOUNT NO. CB60-58401-801565-00-0000000-6030300

It is the intent of these Special Provisions to set for the final contractual intent as to the matter involved and shall prevail over the Standard Specifications and plans whenever in conflict therewith. In order that comparisons between the Special Provisions can be readily made, the numbering system for the Special Provisions is equivalent to that of the Specifications.

00010 PRE-BID INFORMATION

There is a walk through of the facility scheduled for July 30th at 1:00 p.m. We will meet at the maintenance gate located on Mifflin St. near the intersection of Mifflin St. and Brearly St. Please note, Mifflin St. is under construction, and you may need to park on the neighboring streets.

There will be a pre-bid meeting on August 3rd at 1:00 p.m. at the Engineering Service Building, 1602 Emil Street, Madison, Wisconsin, to discuss the Small Business Enterprises (SBE) specifications for the contract. A representative from the Department of Civil Rights will be present.

00100 INSTRUCTIONS TO BIDDERS

Amend Section 101 – "Definitions and Terms" of the Specifications to include the following definition of "Engineer".

> "Engineer. The Director of the Inspection Unit of the Department of Planning and Development acting personally or through an authorized representative."

Amend Section 103.2 of the Specifications, entitled "Award of Contract" to add the following paragraph:

> "The lowest responsible bidder shall be the responsible bidder who submits the lowest Grand Total bid."

Amend Section 102.10 of the Specifications, entitled "Minimum Rate of Wage Scale" to add the following paragraph:

> "The wages and benefits paid on this contract shall not be less than those specified in the Prevailing Wage Determination included with these contract documents for the following type of work:
>
> ☐ Building and Heavy Construction
> ☐ Sewer, Water, and Tunnel Construction
> ☐ Local Street and Miscellaneous Paving Operations
> ☐ Residential and Agricultural Construction

Check off the appropriate category. A description of the work is included in the Prevailing Wage Rate Determination. Most contracts are readily discernible regarding the type of work. The "Residential and Agricultural Construction" classification would be rare. Contracts for street work may include the

"Sewer, Water, and Tunnel Construction" and the "Local Street and Miscellaneous Paving Operations" categories.

The following are from the City of Madison Standard Specifications for Public Works Construction and are reproduced here for the convenience of the bidders.

WITHDRAWAL OF PROPOSALS (102.7 – STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION)

All proposals filed with the City will be kept secure and unopened and will not be allowed to pass out of the custody of a representative of the City, except on written request of the bidder or the bidder's authorized representative made prior to expiration of the time set for **receipt** of proposals, and if such withdrawal is made, such prospective bidder shall not be entitled to bid on the contract at hand unless the same is readvertised and proposals are again requested upon such advertisement.

LIQUIDATED DAMAGES (109.9 – STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION)

Should the Contractor fail to complete the work within the time specified in the contract, or within such extra time as may have been allowed by extensions, there shall be deducted from any monies due or that may become due the Contractor, or in the event no monies are due, the Contractor shall pay to the City, the sum set forth in the following schedule for each and every day that the work shall remain uncompleted. This sum shall be considered and treated not as a penalty but as fixed, agreed and liquidated damages due the City from the Contractor by reason of inconvenience to the public, added cost of engineering and supervision, maintenance of detours and other items which have caused an expenditure of public funds resulting from the Contractor's failure to complete the work within the time specified in the contract.

The fixed, agreed and liquidated damages shall be assessed, unless otherwise specified, in accordance with the following schedule, which represents the City's estimate of damages at the time of contracting:

CONTRACT AMOUNT			
ORIGINAL CONTRACT AMOUNT		DAILY CHARGE	
From More Than	To and Including	Calendar Day	Working Day
$ 0	$ 50,00	$ 150.00	$ 300.00
50,000	100,00	180.00	360.00
100,000	300,00	295.00	590.00
300,000	500.00	480.00	960.00
500,000	1,000,000	665.00	1,330.00
$ 1,000.000	$ ---	$ 990.00	$ 1,980.00

ACCEPTANCE AND FINAL PAYMENT (110.5 STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION)

When the work has been accepted by the Engineer in accordance with section 105.15, the Engineer will prepare the final estimate of the quantities of the various classes of work performed. After the Contractor reviews and accepts the final estimate, and after the Contractor submits an affidavit certifying full compliance with Section 66.0903, Wisconsin Statutes, and receipt of evidence of such compliance by all subcontractors, the Engineer will recommend to the

Common Council that the final payment be made. Within thirty (30) days after such action the Contractor will be paid the entire sum then due, subject to deductions for prior payments and setoffs under the contract.

All prior partial estimates and payments shall be subject to correction in the final estimate and payment.

The making of final payment shall not release the surety nor constitute a waiver of rights by the City. The guarantee of Section 105.16 is cumulative and not exclusive.

The City of Madison Standard Specifications for Public works Construction – 2004 Edition and addenda thereto, forms a part of these contract documents as if attached hereto. These standard specifications are available on request from the City Engineer, City Engineering Division, Room 115, City County Building, Madison WI 53710.

COMPLETION DATE/CONTRACT TIME

Construction work must begin within seven (7) calendar days after the date appearing on the Start to Work letter. Work shall be carried on at a rate so as to secure full completion by May 30th, 2008, the rate of progress and the time of completion being essential conditions of this Agreement.

PRODUCT OPTIONS AND SUBSTITUTIONS

Materials and equipment for this project shall be from items specified or items approved as equal, in writing, by the Architect at least eight (8) days prior to bid receipt date.

Request for approval of materials or items of equipment as equal to that specified shall be submitted in writing from the General Contractor accompanied by data adequate to establish such equality and by citation of at least two (2) situations where such materials and/or items of equipment have been successfully used, including references.

The Architect's decision as to qualify or relative merit of item or substitution shall be submitted in writing from the General Contractor accompanied by data adequate to establish such equality and by citation of at least two (2) situation where such materials and/or items of equipment have been successfully used including references.

The Architect's decision as to quality or relative merit of item or substitution shall be final.

GENERAL INFORMATION

Obtain and pay for permits and fees required for this project.

Obtain and pay for construction sets of plans and specifications required for this project.

Prior to bidding, visit site to become familiar with and verify existing job conditions.

Do not scale drawings for exact dimensions.

Work shall comply with applicable codes and regulations.

Contact Tom Maglio, Parks Division, at 266-6518 for site access, coordination of work, and material storage area designation.

Perform contract so as to minimize disruption of the operation of the building and personnel. Contractor and subcontractor personnel must check in with site contact person each time they arrive at the site to begin work.

Contractor shall be responsible for restoring, repairing and/or replacing any materials, equipment, or site damage caused by work of this project to its original finish and/or condition.

Work shall be performed by mechanics skilled in the area of work included in this contract; shall be of professional quality; and shall be completed according to the best practice of the trade.

Workers shall be knowledgeable with regard to products used and shall take appropriate precautions required to safeguard health and safety.

Existing building materials that may have hazardous content and are located within the work area (for example: floor tile, ceiling tile, pipe insulation) shall be sampled, tested, and removed by the City. If any suspect hazardous building materials are found by the contractor during demolition or renovation work that have not been sampled and tested, work must stop and a certified hazardous material inspector must be contacted by the City to assess the situation. Inaccessible areas may exist within the facility.

The intent of the plans and specifications is to provide for the construction, execution, and completion of a complete work or improvements, which the contractor undertakes to do in full compliance with the plans, specifications, and contract. The Contractor shall perform all items of work covered and stipulated in the proposal and perform altered and extra work necessary to the prosecution and completion of the work.

The Contractor shall take no advantage of any apparent error or omission in the plans or specifications, and the Owner shall be permitted to make such corrections and interpretations as may be deemed necessary for the fulfillment of the intent of the plans and specifications.

Conditions of the Contract and Division I Specification Selections are applicable to all Divisions of the Specifications and Drawings.

EXAMINATION

A. Bidders shall carefully examine the plans and specifications and the project site to obtain first-hand knowledge of existing conditions. It is the Bidder's responsibility to be familiar with the site and documents; no extras will be approved for conditions that could be reasonably determined at the time of bidding.

QUESTIONS AND ADDENDA

A. The Bidder shall resolve all questions regarding the intent of the specifications or drawings with the Consultant prior to submitting his bid. If necessary to change or clarify the intent of the specifications or drawings, the Consultant will issue, to all prime bidders of Record, an Addendum that will become part of the Contract Documents. The consultant will not be responsible for oral clarifications.

B. In the event of a conflict between those specifications and drawing, the bidder shall be responsible for the resolution of the conflict with the consultant prior to submitting his bid. Any and all costs associated with the resolution of such conflicts shall be included in the Bidder's Bid Price.

C. The Bidder shall acknowledge receipt of Addenda and the inclusion of any and all associated costs within his Bid Price, by certifying receipt on the Bid Form.

Definitions:

1. The work "furnish" shall mean to purchase, supply, and deliver to the project site, elevation, and location, those materials and/or services which are necessary for the completion of the Work.

2. The work "install" shall mean to place and integrate materials into position for their designed use.

3. The work "provide" shall mean furnish and install.

4. The "manufacturer" shall mean the manufacturer or private-labeler of the material which are to be integrated into the Work.

QUESTIONS

Questions pertaining to this project shall be directed to Jacqueline Kimber of Isthmus Architecture, Inc., 613 Williamson St., Suite 203, Madison, WI 53703, (608) 294-0206, ext. 243.

SECTION 00 01 13 TABLE OF CONTENTS

TABLE OF CONTENTS
Project No. **0438 Breese Stevens Athletic Field**

SECTION 00 01 15 TITLEPAGE

LIST OF SHEETS

T1.0 Title Sheet

SITE/CIVIL/LANDSCAPE

C1. 0 Existing Topographic Survey
C1.1 Site Layout, Grading, & Utilities
C1.2 Site Drain Tile

STRUCTURAL

S1.1 General Notes
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SECTION 011000 - SUMMARY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:

1. Work covered by the Contract Documents.
2. Type of the Contract.
3. Work phases.
4. Use of premises.
5. Owner's occupancy requirements.
6. Work restrictions.
7. Specification formats and conventions.

B. Related Sections include the following:
1. Division 01 Section "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: Breese Stevens Field Renovation

1. Project Location: 917 East Mifflin Street, Madison, Wisconsin 53703

B. Owner: City of Madison, Wisconsin.

1. Owner's Representative: Si Widstrand, Parks Division, 215 Martin Luther King, Jr. Blvd. Suite 120, PO Box 2987, Madison, WI 53701.

C. Architect: Charlie Quagliana, Isthmus Architecture, 613 Williamson Street, Suite, 203, Madison, Wisconsin, 53703.

D. Contractor: to be determined.

E. Project Coordinator: Tom Maglio, Parks Division, 215 Martin Luther King, Jr. Blvd. Suite 120, PO Box 2987, Madison, WI 53701. has been appointed by Owner to serve as Project Coordinator.

F. The Work consists of the following:

1. The Work includes: removal of existing press box, existing fiberglass and wood bleacher benches, pipe railing, and wood platform seating areas, repairs and rehabilitation of the concrete grandstands and field walls, installation of new bleacher seating and new accessible seating platforms, new athletic field drainage system, two new field entrances, installation of new railing, construction of an accessible ramp to a new accessible vomitory entrance to the grandstands, new accessible entrance to the stadium, other accessibility improvements, new ticket and concessions area, new restrooms, and new fire suppression system.

1.4 TYPE OF CONTRACT

A. Project will be constructed under a single prime contract.

1.5 WORK PHASES

A. The Work shall be conducted in one (1) phases in the following order, with each phase substantially complete before beginning the next phase:

1. All work to the athletic field shall be completed in the Fall, 2007 so that the field has time to repair by April 1, 2008, which is the opening of the stadium for the athletic season.

2. Field Entrances and Fire Protection equipment enclosure shall be completed by April 1, 2008.

3. All construction shall be complete by May 30, 2008.

B. Before commencing Work, submit a schedule showing the sequence, commencement and completion dates, and move-out and -in dates of Owner's personnel for all phases of the Work.

1.6 USE OF PREMISES

A. General: Contractor shall have full use of premises for construction operations, including use of Project site, during construction period. Contractor's use of premises is limited only by Owner's right to perform work or to retain other contractors on portions of Project.

B. Use of Site: Limit use of premises to areas within the Contract limits indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.

1. Limits: Confine construction operations to Sheet A1.1

2. Owner Occupancy: Allow for Owner occupancy of Project site.

3. Driveways and Entrances: Keep driveways and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times.

a. Schedule deliveries to minimize use of driveways and entrances.

b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

C. Use of Existing Building: Maintain existing building in a weathertight condition throughout construction period. Repair damage caused by construction operations. Protect building and its occupants during construction period.

1.7 OWNER'S OCCUPANCY REQUIREMENTS

A. Full Owner Occupancy: While the stadium will not be used for athletic purposes during the winter months, the Owner will occupy site and building during entire construction period for general maintenance purposes, primarily in the areas between gridlines N1-O5. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's day-to-day operations. Maintain existing exits, unless otherwise indicated.

1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and authorities having jurisdiction.
2. Provide not less than [48] forty-eight hours' notice to Owner of activities that will affect Owner's operations.

B. Owner Occupancy of Completed Areas of Construction: Owner reserves the right to occupy and to place and install equipment in completed areas of building, before Substantial Completion, provided such occupancy does not interfere with completion of the Work. Such placement of equipment and partial occupancy shall not constitute acceptance of the total Work.

1. Architect will prepare a Certificate of Substantial Completion for each specific portion of the Work to be occupied before Owner occupancy.
2. Obtain a Certificate of Occupancy from authorities having jurisdiction before Owner occupancy.
3. Before partial Owner occupancy, mechanical and electrical systems shall be fully operational, and required tests and inspections shall be successfully completed. On occupancy, Owner will operate and maintain mechanical and electrical systems serving occupied portions of building.
4. On occupancy, Owner will assume responsibility for maintenance and custodial service for occupied portions of building.

1.8 WORK RESTRICTIONS

A. On-Site Work Hours: Work shall be generally performed inside the existing building during normal business working hours of 7 a.m. to 5 p.m., Monday through Friday, except otherwise indicated.

1. Weekend Hours: Verify restrictions with Owner.
2. Early Morning Hours: Verify restrictions with Owner
3. Hours for Utility Shutdowns: Verify restrictions with Owner and local utilities.
4. Hours for Core Drilling & other noisy activity: Verify restrictions with Owner.

B. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:

1. Notify Owner not less than five (5) days in advance of proposed utility interruptions.
2. Do not proceed with utility interruptions without Owner's written permission.

1.9 SPECIFICATION FORMATS AND CONVENTIONS

A. Specification Format: The Specifications are organized into Divisions and Sections using the 50-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 01: Sections in Division 01 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.

1.10 MISCELLANEOUS PROVISIONS

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 011000

SECTION 012200 - UNIT PRICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for unit prices.

B. Related Sections include the following:

1. Division 01 Section "Allowances" for procedures for using unit prices to adjust quantity allowances.
2. Division 01 Section "Contract Modification Procedures" for procedures for submitting and handling Change Orders.
3. Division 01 Section "Quality Requirements" for general testing and inspecting requirements.

1.3 DEFINITIONS

A. Unit price is an amount proposed by bidders, stated on the Bid Form, as a price per unit of measurement for materials or services added to or deducted from the Contract Sum by appropriate modification, if estimated quantities of Work required by the Contract Documents are increased or decreased.

1.4 PROCEDURES

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

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

C. Owner reserves the right to reject Contractor's measurement of work-in-place that involves use of established unit prices and to have this work measured, at Owner's expense, by an independent surveyor acceptable to Contractor.

D. List of Unit Prices: A list of unit prices is included in Part 3. Specification Sections referenced in the schedule contain requirements for materials described under each unit price.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 LIST OF UNIT PRICES – See Bid Form

END OF SECTION 012200

SECTION 012600 - CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section specifies administrative and procedural requirements for handling and processing Contract modifications.

B. Related Sections include the following:

1. Division 01 Section "Allowances" for procedural requirements for handling and processing allowances.
2. Division 01 Section "Unit Prices" for administrative requirements for using unit prices.
3. Division 01 Section "Product Requirements" for administrative procedures for handling requests for substitutions made after Contract award.

1.3 MINOR CHANGES IN THE WORK

A. Architect will issue supplemental instructions authorizing Minor Changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, in the form of a construction bulletin.

1.4 PROPOSAL REQUESTS

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

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

a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.

b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
c. Include costs of labor and supervision directly attributable to the change.
d. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.

B. Contractor-Initiated Proposals: If latent or unforeseen conditions require modifications to the Contract, Contractor may propose changes by submitting a request for a change to City of Madison Project Manager.

1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
4. Include costs of labor and supervision directly attributable to the change.
5. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
6. Comply with requirements in Division 01 Section "Product Requirements" if the proposed change requires substitution of one product or system for product or system specified.

C. Proposal Request Form: Use AIA Document G709 for Proposal Requests or other similar document.

1.5 ALLOWANCES

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

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

B. Submit claims for increased costs because of a change in scope or nature of the allowance described in the Contract Documents, whether for the Purchase Order amount or Contractor's

handling, labor, installation, overhead, and profit. Submit claims within 7 days of receipt of the Change Order or Construction Change Directive authorizing work to proceed. Owner will reject claims submitted later than 7 days after such authorization.

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

1.6 CHANGE ORDER PROCEDURES

A. On Owner's approval of a Proposal Request, City of Madison Project Manager will issue a Change Order for signatures of Owner and Contractor on AIA Document G701.

1.7 CONSTRUCTION CHANGE DIRECTIVE

A. Construction Change Directive: Architect may issue a Construction Change Directive on AIA Document G714. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.

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

B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.

1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012600

SECTION 013100 - 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 01 Specification Sections, apply to this Section.

1.2 SUMMARY

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

1. Coordination Drawings.
2. Administrative and supervisory personnel.
3. Project meetings.
4. Requests for Interpretation (RFIs).

B. Each contractor shall participate in coordination requirements. Certain areas of responsibility will be assigned to a specific contractor.

C. Related Sections include the following:

1. Division 01 Section "Construction Progress Documentation" for preparing and submitting Contractor's Construction Schedule.
2. Division 01 Section "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
3. Division 01 Section "Closeout Procedures" for coordinating closeout of the Contract.

1.3 COORDINATION

A. Coordination: Each contractor shall coordinate its construction operations with those of other contractors and entities to ensure efficient and orderly installation of each part of the Work. Each contractor shall coordinate its operations with operations, included in different Sections, 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 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. Mock-Up Inspections and Procedures
6. Progress meetings.
7. Startup and adjustment of systems.
8. 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.

1.4 SUBMITTALS

A. Key Personnel Names: Within 15 days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home and office telephone numbers. Provide names, addresses, and telephone numbers of individuals assigned as standbys in the absence of individuals assigned to Project.

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

1.5 ADMINISTRATIVE AND SUPERVISORY PERSONNEL

A. General: In addition to Project superintendent, provide other administrative and supervisory personnel as required for proper performance of the Work.

1. Include special personnel required for coordination of operations with other contractors.

1.6 PROJECT MEETINGS

A. General: Contractor shall schedule and conduct meetings and conferences at Project site, unless otherwise indicated. Contractor shall also perform the following duties as required:

1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner, Owner's Construction Manager 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 five days of the meeting. Minutes of meetings are to be recorded by either the Contractor or the Construction Manager. Contractor and Construction Manager must determine who is responsible for producing and distributing meeting minutes.

B. Preconstruction Conference: Owner shall schedule a preconstruction conference before starting construction, at a time convenient Contractor and Architect, but no later than 7 days after execution of the Agreement. Hold the conference at Project site or another convenient location. Contractor shall conduct the meeting to review responsibilities and personnel assignments.

1. Attendees: Authorized representatives; Owner's Construction Manager, Architect, Contractor and its superintendent; 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: Contractor shall discuss items of significance that could affect progress, including the following:

a. Tentative construction schedule.
b. Phasing.
c. Critical work sequencing and long-lead items.
d. Designation of key personnel and their duties.
e. Procedures for processing field decisions and Change Orders.
f. Traffic Control plans of Contractor.
g. Haul Routes proposed by Contractor.
h. Disposal sites proposed by Contractor.
i. Erosion Control Plans of the Contractor.
j. Measurement of Quantities.
k. Drawings and Specifications.
l. Material Certificates.
m. Certificates of Insurance of Contractor and all Subcontractors.
n. Procedures for requests for interpretations (RFIs).
o. Procedures for testing and inspecting.
p. Procedures for conducting Mock-up panels.
q. Procedures for processing Applications for Payment.
r. Distribution of the Contract Documents.
s. Submittal procedures.
t. Preparation of Record Documents.
u. Use of the premises.
v. Work restrictions.
w. Owner's occupancy requirements.
x. Responsibility for temporary facilities and controls.

y. Parking availability.
z. Office, work, and storage areas.
aa. Equipment deliveries and priorities.
bb. First aid.
cc. Security.
dd. Progress cleaning.
ee. Working hours.

3. Minutes: Contractor shall Record and distribute meeting minutes.

C. Progress Meetings: Contractor shall conduct progress meetings at intervals agreed upon by the Owner, Architect and the Contractor. Meetings shall be scheduled for no less than one meeting per calendar month. Contractor shall coordinate dates of meetings with preparation of payment requests.

1. Attendees: In addition to representatives of Owner, Architect and 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: Attendees shall 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. Contractor shall lead discussions to review present and future needs of each entity present, including the following:

1) Interface requirements.
2) Sequence of operations.
3) Status of submittals.
4) Deliveries.
5) Off-site fabrication.
6) Access.
7) Site utilization.
8) Temporary facilities and controls.
9) Work hours.
10) Hazards and risks.
11) Progress cleaning.
12) Quality and work standards.
13) Status of correction of deficient items.
14) Field observations.
15) Requests for interpretations (RFIs).

16) Status of proposal requests.
17) Pending changes.
18) Status of Change Orders.
19) Pending claims and disputes.
20) Documentation of information for payment requests.
21) Review of Mock-ups.

3. Minutes: Contractor shall Record and distribute meeting minutes.

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

   a. Schedule Updating: Contractor shall revise the 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.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013100

SECTION 013200 - 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 01 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.
3. Submittals Schedule.
4. Daily construction reports.
5. Material location reports.
6. Field condition reports.
7. Special reports.

B. Related Sections include the following:

1. Division 01 Section "Multiple Contract Summary" for preparing a combined Contractor's Construction Schedule.
2. Division 01 Section "Payment Procedures" for submitting the Schedule of Values.
3. Division 01 Section "Project Management and Coordination" for submitting and distributing meeting and conference minutes.
4. Division 01 Section "Photographic Documentation" for submitting construction photographs.
5. Division 01 Section "Submittal Procedures" for submitting schedules and reports.
6. Division 01 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. Major Area: A story of construction, a separate building, or a similar significant construction element.

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

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

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

1.4 SUBMITTALS

A. Contractor's Construction Schedule: Submit opaque copies of initial schedule, large enough to show entire schedule for entire construction period. Submit two copies to each the Owner, Construction Manager and the Architect.

1.5 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 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 commencement of the Work 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 20 days, unless specifically allowed by Architect.

   a. Procurement Activities: Include procurement process activities long lead items and major items, requiring a cycle of more than 60 days, as separate activities in schedule.

2. Startup and Testing Time: Include not less than 3 days for startup and testing.
3. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Architect's and City of Madison Project Manager's administrative procedures necessary for certification of Substantial Completion.

D. 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 01 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.

2.2 CONTRACTOR'S CONSTRUCTION SCHEDULE (GANTT CHART)

A. Gantt-Chart Schedule: Submit a comprehensive, fully developed, horizontal Gantt-chart-type, Contractor's Construction Schedule within 5 days of date established for commencement of the Work. Base schedule on the Preliminary Construction Schedule and whatever updating and feedback was received since the start of Project.

B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line.

1. For construction activities that require 3 months or longer to complete, indicate an estimated completion percentage in 10 percent increments within time bar.

2.3 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 when requested by Architect or City of Madison Project Manager. 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. Contractor's Construction Schedule Updating: At monthly 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.

B. Distribution: Distribute copies of approved schedule to City of Madison Project Manager, Owner and Architect, separate contractors, 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 013200

SECTION 013300 - 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 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals. Shop Drawings, Product Data, Samples and other submittals shall be submitted to the Architect for review and approval.

B. Related Sections include the following:

1. Division 01 Section "Payment Procedures" for submitting Applications for Payment and the Schedule of Values.
2. Division 01 Section "Project Management and Coordination" for submitting and distributing meeting and conference minutes and for submitting Coordination Drawings.
3. Division 01 Section "Construction Progress Documentation" for submitting schedules and reports, including Contractor's Construction Schedule and the Submittals Schedule.
4. Division 01 Section "Quality Requirements" for submitting test and inspection reports and for mockup requirements.
5. Division 01 Section "Closeout Procedures" for submitting warranties.
6. Division 01 Section "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.
7. Division 01 Section "Operation and Maintenance Data" for submitting operation and maintenance manuals.
8. Division 01 Section "Demonstration and Training" for submitting videotapes of demonstration of equipment and training of Owner's personnel.
9. Divisions 02 through 49 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.

1.4 SUBMITTAL PROCEDURES

A. General: Electronic copies of CAD Drawings of the Contract Drawings will not be provided by Architect for Contractor's use in preparing submittals.

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 01 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 5 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 5 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 15 days for initial review of each submittal.

5. Concurrent Consultant Review: Where the Contract Documents indicate that submittals may be transmitted simultaneously to Architect and to Architect's consultants, allow 15 days for review of each submittal. Submittal will be returned to Architect before being returned to Contractor.

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 4 by 4 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.

        1) Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g., 06100.01). Resubmittals

shall include an alphabetic suffix after another decimal point (e.g., 06100.01.A).

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: Encircle or 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 not 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.
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.

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 "Approved" or "Approved 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 "Approved" or "Approved as noted".

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. Mill reports.
    j. Standard product operation and maintenance manuals.
    k. Compliance with specified referenced standards.
    l. Testing by recognized testing agency.
    m. Application of testing agency labels and seals.
    n. Notation of coordination requirements.

4. Submit Product Data before or concurrent with Samples.
5. Number of Copies: Submit four copies of Product Data, unless otherwise indicated. Architect will return two 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. Wiring diagrams showing field-installed wiring, including power, signal, and control wiring.
    f. Shopwork manufacturing instructions.
    g. Templates and patterns.
    h. Schedules.
    i. Design calculations.
    j. Compliance with specified standards.
    k. Notation of coordination requirements.
    l. Notation of dimensions established by field measurement.
    m. Relationship to adjoining construction clearly indicated.
    n. Seal and signature of professional engineer if specified.
    o. 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 30 by 42 inches.
3. Number of Copies: Submit four opaque (bond) copies of each submittal. Architect will return two copies.

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 that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
    b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.

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 one 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 four sets of Samples. Architect will retain two Sample sets; remainder will be returned.

      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 four 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. Contractor's Construction Schedule: Comply with requirements specified in Division 01 Section "Construction Progress Documentation" for Construction Manager's action.

G. Application for Payment: Comply with requirements specified in Division 01 Section "Payment Procedures."

H. Schedule of Values: Comply with requirements specified in Division 01 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. Include the following information in tabular form:

1. Name, address, and telephone number of entity performing subcontract or supplying products.

2. Number of Copies: Submit four 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 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 four 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.

C. Partial submittals are not acceptable, will be considered nonresponsive, and will be returned without review.

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

END OF SECTION 013300

SECTION 014000 - 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 01 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 01 Section "Allowances" for testing and inspecting allowances.
2. Division 01 Section "Construction Progress Documentation" for developing a schedule of required tests and inspections.
3. Division 01 Section "Cutting and Patching" for repair and restoration of construction disturbed by testing and inspecting activities.
4. Divisions 02 through 49 Sections for specific test and inspection requirements.

1.3 DEFINITIONS

A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and 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 or City of Madison Project Manager.

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. 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.

E. 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.

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

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

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

I. 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.

J. Experienced: When used with an entity, "experienced" means having successfully completed a minimum of 2 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. 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. 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.

I. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:

1. Contractor responsibilities include the following:

   a. Provide test specimens representative of proposed products and construction.
   b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
   c. Provide sizes and configurations of test assemblies, mockups, and laboratory mockups to adequately demonstrate capability of products to comply with performance requirements.
   d. Build site-assembled test assemblies and mockups using installers who will perform same tasks for Project.
   e. Build laboratory mockups at testing facility using personnel, products, and methods of construction indicated for the completed Work.
   f. When testing is complete, remove test specimens, assemblies, mockups, and laboratory mockups; do not reuse products on Project.

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

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

1. Build mockups in location and of size indicated or, if not indicated, as directed by Architect.
2. Notify Architect and City of Madison Project Manager seven days in advance of dates and times when mockups will be constructed.
3. Demonstrate the proposed range of aesthetic effects and workmanship.
4. Obtain Architect's approval of mockups before starting work, fabrication, or construction.

   a. Allow seven days for initial review and each re-review of each mockup.

5. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
6. Demolish and remove mockups when directed, unless otherwise indicated.

1.7 QUALITY CONTROL

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

1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.
2. Payment for these services will be made from testing and inspecting allowances, as authorized by Change Orders.
3. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor.

B. Tests and inspections not explicitly assigned to Owner 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. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.

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

2. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
3. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

C. 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 01 Section "Submittal Procedures."

D. 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.

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

1. Notify Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
2. 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.

F. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:

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

G. 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.

H. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents. Submit schedule within 15 days of date established for commencement of the Work.

1. Distribution: Distribute schedule to Owner, Architect, City of Madison Project Manager testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

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 and City of Madison Project Manager 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.
2. Comply with the Contract Document requirements for Division 01 Section "Cutting and Patching."

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 014000

SECTION 014200 - REFERENCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 DEFINITIONS

A. General: Basic Contract definitions are included in the Conditions of the Contract.

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

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

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

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

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

G. "Install": Operations at Project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.

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

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

1.3 INDUSTRY STANDARDS

A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if

bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.

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

C. Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.

1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

D. Abbreviations and Acronyms for Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the standards and regulations in the following list. Names, telephone numbers, and Web-site addresses are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

ADAAG	Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities Available from Access Board www.access-board.gov	(800) 872-2253 (202) 272-0080

1.4 ABBREVIATIONS AND ACRONYMS

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

B. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web-site addresses are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

AAMA	American Architectural Manufacturers Association www.aamanet.org	(847) 303-5664
ACI	ACI International (American Concrete Institute) www.aci-int.org	(248) 848-3700
AGC	Associated General Contractors of America (The) www.agc.org	(703) 548-3118
AIA	American Institute of Architects (The) www.aia.org	(800) 242-3837 (202) 626-7300

AISC	American Institute of Steel Construction www.aisc.org	(800) 644-2400 (312) 670-2400
AISI	American Iron and Steel Institute www.steel.org	(202) 452-7100
ANSI	American National Standards Institute www.ansi.org	(202) 293-8020
APA	Architectural Precast Association www.archprecast.org	(239) 454-6989
ASCE	American Society of Civil Engineers www.asce.org	(800) 548-2723 (703) 295-6300
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers www.ashrae.org	(800) 527-4723 (404) 636-8400
ASTM	ASTM International (American Society for Testing and Materials International) www.astm.org	(610) 832-9585
AWS	American Welding Society www.aws.org	(800) 443-9353 (305) 443-9353
AWWA	American Water Works Association www.awwa.org	(800) 926-7337 (303) 794-7711
BHMA	Builders Hardware Manufacturers Association www.buildershardware.com	(212) 297-2122
BIA	Brick Industry Association (The) www.bia.org	(703) 620-0010
CRSI	Concrete Reinforcing Steel Institute www.crsi.org	(847) 517-1200
CSI	Construction Specifications Institute (The) www.csinet.org	(800) 689-2900 (703) 684-0300
DHI	Door and Hardware Institute www.dhi.org	(703) 222-2010
EJMA	Expansion Joint Manufacturers Association, Inc. www.ejma.org	(914) 332-0040
IESNA	Illuminating Engineering Society of North America www.iesna.org	(212) 248-5000

MH	Material Handling (Now MHIA)	
MPI	Master Painters Institute www.paintinfo.com	(888) 674-8937
NAAMM	National Association of Architectural Metal Manufacturers www.naamm.org	(312) 332-0405
NCMA	National Concrete Masonry Association www.ncma.org	(703) 713-1900
NFPA	NFPA (National Fire Protection Association) www.nfpa.org	(800) 344-3555 (617) 770-3000
NGA	National Glass Association www.glass.org	(703) 442-4890
NRMCA	National Ready Mixed Concrete Association www.nrmca.org	(888) 846-7622 (301) 587-1400
NSSGA	National Stone, Sand & Gravel Association www.nssga.org	(800) 342-1415 (703) 525-8788
SMA	Screen Manufacturers Association www.smacentral.org	(561) 533-0991
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association www.smacna.org	(703) 803-2980
SPIB	Southern Pine Inspection Bureau (The) www.spib.org	(850) 434-2611
SWRI	Sealant, Waterproofing, & Restoration Institute www.swrionline.org	(816) 472-7974
UL	Underwriters Laboratories Inc. www.ul.com	(800) 285-4476 (847) 272-8800
WDMA	Window & Door Manufacturers Association (Formerly: NWWDA - National Wood Window and Door Association) www.wdma.com	(800) 223-2301 (847) 299-5200

C. Code Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names,

telephone numbers, and Web-site addresses are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

ICC	International Code Council (Formerly: CABO - Council of American Building Officials) www.iccsafe.org	(703) 931-4533

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 014200

SECTION 015000 - 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 01 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 01 Section "Summary" for limitations on utility interruptions and other work restrictions.
2. Division 01 Section "Submittal Procedures" for procedures for submitting copies of implementation and termination schedule and utility reports.
3. Division 01 Section "Execution" for progress cleaning requirements.
4. Divisions 02 through 49 Sections for temporary heat, ventilation, and humidity requirements for products in those Sections.

1.3 DEFINITIONS

A. Permanent Enclosure: As determined by Architect, permanent or temporary roofing is complete, insulated, and weathertight; exterior walls are insulated and weathertight; and all openings are closed with permanent construction or substantial temporary closures.

1.4 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 construction forces, Architect, 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.

1.5 SUBMITTALS

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

1.6 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.

1.7 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.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Lumber and Plywood: Comply with requirements in Division 06 Section "Rough Carpentry".

B. Gypsum Board: Minimum 1/2 inch (12.7 mm) thick by 48 inches (1219 mm) wide by maximum available lengths; regular-type panels with tapered edges. Comply with ASTM C 36/C 36M.

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

D. Paint: Comply with requirements in Division 09 painting Sections.

2.2 TEMPORARY FACILITIES

A. 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.

2.3 EQUIPMENT

A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

B. Heating Equipment: Unless Owner authorizes use of permanent heating system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.

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

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: Use of Owner's existing water service facilities will be permitted, as long as facilities are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.

1. Where installations below an outlet might be damaged by spillage or leakage, provide a drip pan of suitable size to minimize water damage. Drain accumulated water promptly from pans.

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: Provide temporary heating 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: Use of Owner's existing electric power service will be permitted, as long as equipment is maintained in a condition acceptable to Owner.

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.
2. Install lighting for Project identification sign.

I. Provide superintendent with cellular telephone or portable two-way radio for use when away from 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 (9 m) 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. Protect existing site improvements to remain including curbs, pavement, and utilities.
2. Maintain access for fire-fighting equipment and access to fire hydrants.

C. Parking: Use areas designated by owner as parking areas for construction personnel as agreed upon at the pre-construction conference.

D. Dewatering Facilities and Drains: Comply with requirements of authorities having jurisdiction. Maintain Project site, excavations, and construction free of water.

1. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining properties nor endanger permanent Work or temporary facilities.
2. Remove snow and ice as required to minimize accumulations.

E. 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. Maintain and touchup signs so they are legible at all times.

F. Waste Disposal Facilities: Comply with requirements specified in Division 01 Section "Construction Waste Management and Disposal."

G. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction. Comply with Division 01 Section "Execution" for progress cleaning requirements.

H. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.

1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.

I. Temporary Stairs: Until permanent stairs are available, provide temporary stairs where ladders are not adequate.

J. Existing Stair Usage: Use of Owner's existing stairs will be permitted, as long as stairs are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore stairs to condition existing before initial use.

1. Provide protective coverings, barriers, devices, signs, or other procedures to protect stairs and to maintain means of egress. If, despite such protection, stairs become damaged, restore damaged areas so no evidence remains of correction work.

K. Temporary Use of Permanent Stairs: Cover finished, permanent stairs with protective covering of plywood or similar material so finishes will be undamaged at time of acceptance.

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 01 Section "Summary."

B. Temporary Erosion and Sedimentation Control: Comply with requirements specified in Division 31 Section "Site Clearing."

C. Temporary Erosion and Sedimentation Control: Provide measures to prevent soil erosion and discharge of soil-bearing water runoff and airborne dust to adjacent properties and walkways, according to requirements of authorities having jurisdiction.

1. Inspect, repair, and maintain erosion- and sedimentation-control measures during construction until permanent vegetation has been established.

D. 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.

E. Tree and Plant Protection: Comply with requirements specified in Division 01 Section "Temporary Tree and Plant Protection."

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

G. 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.

H. 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: As indicated on Drawings.
2. Maintain security by limiting number of keys and restricting distribution to authorized personnel. Provide Owner with one set of keys.

I. 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.

J. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.

K. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.

1. Where heating or cooling is needed and permanent enclosure is not complete, insulate temporary enclosures.

L. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241.

1. Prohibit smoking in construction areas.
2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.
3. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.
4. Provide temporary standpipes and hoses for fire protection. Hang hoses with a warning sign stating that hoses are for fire-protection purposes only and are not to be removed. Match hose size with outlet size and equip with suitable nozzles.

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. Operate Project-identification-sign lighting daily from dusk until 12:00 midnight.

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

E. 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. Remove temporary paving not intended for or acceptable for integration into permanent paving. Where area is intended for landscape development, remove soil and aggregate fill that do not comply with requirements for fill or subsoil. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that might impair growth of plant materials or lawns. Repair or replace street paving, curbs, and sidewalks at temporary entrances, as required by authorities having jurisdiction.
3. At Substantial Completion, clean and renovate permanent facilities used during construction period. Comply with final cleaning requirements specified in Division 01 Section "Closeout Procedures."

END OF SECTION 015000

SECTION 016000 - 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 01 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 01 Section "Allowances" for products selected under an allowance.
2. Division 01 Section "Alternates" for products selected under an alternate.
3. Division 01 Section "References" for applicable industry standards for products specified.
4. Division 01 Section "Closeout Procedures" for submitting warranties for Contract closeout.
5. Divisions 02 through 49 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. 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 from, 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.

B. Substitution Requests: Submit four 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 form developed by Contractor.
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 7 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. Basis-of-Design Product Specification Submittal: Comply with requirements in Division 01 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. Each contractor is responsible for providing products and construction methods compatible with products and construction methods of other contractors.
2. If a dispute arises between contractors over concurrently selectable but incompatible products, Architect will determine which products shall be used.

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. Specified Form: When specified forms are included with the Specifications, prepare a written document using appropriate form properly executed.
3. Refer to Divisions 02 through 49 Sections for specific content requirements and particular requirements for submitting special warranties.

C. Submittal Time: Comply with requirements in Division 01 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.
6. Descriptive, performance, and reference standard requirements in the Specifications establish "salient characteristics" of products.
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.

9. Visual Matching Specification: Where Specifications require matching an established Sample, select a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.

    a. If no product available within specified category matches and complies with other specified requirements, comply with provisions in Part 2 "Product Substitutions" Article for proposal of product.

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

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

2.2 PRODUCT SUBSTITUTIONS

A. Timing: Architect will consider requests for substitution if received within 30 days after commencement of the Work. 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.

10. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

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 016000

SECTION 017300 - EXECUTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

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

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

B. Related Sections include the following:

1. Division 01 Section "Project Management and Coordination" for procedures for coordinating field engineering with other construction activities.
2. Division 01 Section "Submittal Procedures" for submitting surveys.
3. Division 01 Section "Cutting and Patching" for procedural requirements for cutting and patching necessary for the installation or performance of other components of the Work.
4. Division 01 Section "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.

1.3 SUBMITTALS

A. Landfill Receipts: Submit copy of receipts issued by a landfill facility, licensed to accept hazardous materials, for hazardous waste disposal.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

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

1. Before construction, verify the location and points of connection of utility services.

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

1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; and underground electrical services.
2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.

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

1. 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 roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
4. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
5. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

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

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

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

D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents, submit a request for information to Architect. Include a detailed description of problem encountered, together with recommendations for changing the Contract Documents.

3.3 CONSTRUCTION LAYOUT

A. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and invert elevations.

B. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.

3.4 FIELD ENGINEERING

A. Identification: Owner will identify existing benchmarks, control points, and property corners.

B. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.

1. Do not change or relocate existing benchmarks or control points without prior written approval of Architect and City of Madison Project Manager. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to Architect and City of Madison Project Manager before proceeding.
2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.

C. Benchmarks: Establish and maintain a minimum of two permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.

1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
2. Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.
3. Remove temporary reference points when no longer needed. Restore marked construction to its original condition.

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.

1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
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 (27 deg C).
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 STARTING AND ADJUSTING

A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.

B. Adjust operating components for proper operation without binding. Adjust equipment for proper operation.

C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

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 01 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. Comply with requirements in Division 01 Section "Cutting and Patching."

1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.

B. Restore permanent facilities used during construction to their specified condition.

C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.

D. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.

E. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION 017300

SECTION 017329 - CUTTING AND PATCHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes procedural requirements for cutting and patching.

B. Related Sections include the following:

1. Division 01 Section "Selective Structure Demolition" for demolition of selected portions of the building.
2. Divisions 2 through 49 Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work.
3. Division 07 Section "Penetration Firestopping" for patching fire-rated construction.

1.3 DEFINITIONS

A. Cutting: Removal of in-place construction necessary to permit installation or performance of other Work.

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

1.4 QUALITY ASSURANCE

A. Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio.

B. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety. Operating elements include the following:

1. Primary operational systems and equipment.
2. Air or smoke barriers.
3. Mechanical systems piping and ducts.
4. Control systems.
5. Communication systems.
6. Electrical wiring systems.

C. Miscellaneous Elements: Do not cut and patch miscellaneous elements or related components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety. Miscellaneous elements include the following:

1. Water, moisture, or vapor barriers.
2. Membranes and flashings.
3. Piping, ductwork, vessels, and equipment.

D. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

E. Cutting and Patching Conference: At Progress Meeting prior to commencement of Cutting and Patching, meet at Project site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

1.5 WARRANTY

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

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Comply with requirements specified in other Sections.

B. In-Place Materials: Use materials identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.

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

PART 3 - EXECUTION

3.1 EXAMINATION

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

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

2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

3.2 PREPARATION

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

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

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

3.3 PERFORMANCE

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

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

B. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.

1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
3. Concrete & Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
4. Excavating and Backfilling: Comply with requirements in applicable Division 31 Sections where required by cutting and patching operations.
5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
6. Proceed with patching after construction operations requiring cutting are complete.

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

1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.

2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.

    a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
    b. Restore damaged pipe covering to its original condition.

3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.

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

4. Ceilings: Patch and repair ceilings as necessary to provide an even-plane surface of uniform appearance.
5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition.

D. Cleaning: Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar materials.

END OF SECTION 017329

SECTION 017700 - 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 01 Specification Sections, apply to this Section.

1.2 SUMMARY

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

1. Inspection procedures.
2. Warranties.
3. Final cleaning.

B. Related Sections include the following:

1. Division 01 Section "Payment Procedures" for requirements for Applications for Payment for Substantial and Final Completion.
2. Division 01 Section "Execution" for progress cleaning of Project site.
3. Division 01 Section "Demonstration and Training" for requirements for instructing Owner's personnel.
4. Divisions 02 through 49 Sections for specific closeout and special cleaning requirements for the Work in those Sections.

1.3 SUBSTANTIAL COMPLETION

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

1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
2. Advise Owner of pending insurance changeover requirements.
3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
5. Prepare and submit Project Record Documents, operation and maintenance manuals, Final Completion construction photographs, damage or settlement surveys, property surveys, and similar final record information.
6. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.

7. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
8. Complete startup testing of systems.
9. Submit test/adjust/balance records.
10. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
11. Advise Owner of changeover in heat and other utilities.
12. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
13. Complete final cleaning requirements, including touchup painting.
14. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

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. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
2. Results of completed inspection will form the basis of requirements for Final Completion.

1.4 FINAL COMPLETION

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

1. Submit a final Application for Payment according to Division 01 Section "Payment Procedures."
2. Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
4. Submit a consolidated list of all extra and additional materials left to owner's possession following final completion.
5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.

B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.5 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

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

1. Organize list of spaces in sequential order, starting with exterior areas first and moving through the building in sequential order of room numbers.
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 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.

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

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

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

m. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
n. Replace parts subject to unusual operating conditions.

o. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
p. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
q. Clean ducts, blowers, and coils if units were operated without filters during construction.
r. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs, and those noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.
s. Leave Project clean and ready for occupancy.

C. 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 017700

SECTION 017823 - 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 01 Specification Sections, apply to this Section.

1.2 SUMMARY

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

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

B. Related Sections include the following:
1. Division 01 Section "Submittal Procedures" for submitting copies of submittals for operation and maintenance manuals.
2. Division 01 Section "Closeout Procedures" for submitting operation and maintenance manuals.
3. Divisions 02 through 49 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. Final Submittal: Submit one copy of each manual in final form at least 15 days before final inspection.

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

2.3 EMERGENCY MANUALS

A. 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.

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

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

2.4 OPERATION MANUALS

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

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

B. Descriptions: Include the following:

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

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

1. Startup procedures.
2. Equipment or system break-in procedures.
3. Routine and normal operating instructions.
4. Regulation and control procedures.
5. Instructions on stopping.
6. Normal shutdown instructions.
7. Seasonal and weekend operating instructions.
8. Required sequences for electric or electronic systems.
9. Special operating instructions and procedures.

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

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

2.5 PRODUCT MAINTENANCE MANUAL

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

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

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

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

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

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

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

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

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

2.6 SYSTEMS AND EQUIPMENT MAINTENANCE MANUAL

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

B. Source Information: List each system, subsystem, and piece of equipment included in 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 01 Section "Project Record Documents."

G. Comply with Division 01 Section "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

3.2 REVIEW MEETING

A. At Substantial Completion coordinate with the Architect, Owner's Representative and all applicable building occupants to review the Operation and Maintenance Data Manual at an on-site meeting. Discuss the following topics.

1. Review contents of the Manual.
2. Provide overview training on operation and maintenance data using the Manual as a reference. Locate all systems and equipment for meeting attendees and provide basic training on the operation and control of the systems.
3. Answer all questions related to the Operation and Maintenance Manual.

END OF SECTION 017823

SECTION 017839 - 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 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for Project Record Documents, including the following:

1. Record Drawings.
2. Record Specifications.
3. Record Product Data.

B. Related Sections include the following:
1. Division 01 Section "Closeout Procedures" for general closeout procedures.
2. Division 01 Section "Operation and Maintenance Data" for operation and maintenance manual requirements.
3. Divisions 02 through 49 Sections for specific requirements for Project Record Documents of the Work in those Sections.

1.3 SUBMITTALS

A. Record Drawings: Comply with the following:

1. Number of Copies: Submit one original set of marked-up Record Prints and one copy of marked-up Record Prints to Owner. Submit one copy of marked-up Record Prints to Architect.

PART 2 - PRODUCTS

2.1 RECORD DRAWINGS

A. Record Prints: Maintain one set of blue- or black-line white prints of the Contract Drawings and Shop Drawings.

1. Preparation: Mark Record Prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, 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. 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 Contract Drawings.
m. Field records for variable and concealed conditions.
n. 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. 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.

C. 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. Identification: As follows:

a. Project name.
b. Date.
c. Designation "PROJECT RECORD DRAWINGS."
d. Name of Architect.
e. Name of Contractor.

2.2 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.

END OF SECTION 017839

SECTION 024113 - SITE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Identify, disconnect, cap, and remove designated utilities.

2. Demolish and remove designated pavements.

3. Remove demolition materials from site.

4. Temporary protection between demolition area and existing buildings or structures to remain.

B. Related Sections:

1. Applicable provisions of Division 01 shall govern all work under this Section.

2. Section 024114 - Utility Abandonment and Removal: Removal or abandonment of designated site services.

3. Section 310513 - Soils: Subsoil backfill material.

4. Section 310516 - Aggregates: Granular backfill material.

1.2 SUBMITTALS

A. Division 01 - Submittal Procedures: Requirements for submittals.

B. Submit demolition removal procedures and schedule under provisions of Division 01.

C. Submit project record documents under provisions of Division 01.

1. Record drawings should accurately identify location of utilities capped off or abandoned in place, location of foundations or appurtenances abandoned and covered, or items remaining that would affect future work on site.

1.3 REGULATORY REQUIREMENTS

A. Comply with local, state, and federal codes, rules and regulations applicable to demolition work including but not limited to erosion control, air pollution, noise pollution, and waste disposal.

B. Contractor shall obtain and pay for permits required for demolition work.

1.4 PROJECT SITE CONDITIONS

A. Conduct demolition to minimize interference with adjacent structures.

B. Maintain protected egress and access at all times.

C. Provide, erect, and maintain temporary barriers and security devices.

D. Conduct operations with minimum interference to public or private thoroughfares.

E. Do not close or obstruct roadways and sidewalks without permits.

1.5 SITE DEMOLITION REQUIREMENTS

A. Traffic Control Signs:

1. Where pedestrian and driver safety is endangered in area of removal work, use traffic barricades with flashing lights.

2. Anchor barricades in a manner to prevent displacement by wind.

B. Items to Remain in Place:

1. Take necessary precautions to avoid damage to existing items scheduled to remain in

2. place, to be reused, or to remain property of Owner.

3. Repair or replace damaged items as approved by Architect.

4. Construct and maintain shoring, bracing, and supports as required.

5. Ensure that structural elements are not overloaded. Increase structural supports or add new supports as may be required as a result of any cutting, removal, or demolition work performed.

6. Do not overload structural elements and pavements to remain.

7. Provide new supports and reinforcement for existing construction weakened by demolition or removal work.

8. Repairs, reinforcement, or structural replacement require approval by Architect prior to performing such work.

C. Existing Conditions:

1. Before beginning any demolition work, survey project site and examine drawings and specifications to determine extent of demolition work.

2. Protect trees within project site which might be damaged during demolition, and which are indicated to be left in place.

3. Replace any tree designated to remain that is damaged during the work under this contract with like and kind or as approved by Architect.

4. Maintain existing utilities indicated to stay in service and protect against damage during demolition operations.

5. Prior to start of work, utilities serving each area of alteration or removal will be shut off by Utility Owner and disconnected and sealed by Contractor.

1.6 HAZARDOUS MATERIALS

A. If Contractor encounters a hazardous material during demolition process, it shall cease operations immediately and notify Owner and Architect of its findings.

B. Owner will employ a Contractor, experienced and certified in removal and disposal of hazardous substances to perform removal and disposal work.

C. Contractor shall not reinstate demolition operations until areas have been cleared for continuation of demolition work.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 NOTIFICATION

A. In accordance with Wisconsin Statute 182.0175, "Damage to Transmission Facilities," Excavator, as defined in 182.0175(1)(bm), shall be solely responsible to provide advance notice to "Diggers Hotline, Inc." (800-242-8511) not less than three working days prior to commencement of any Excavation, as defined in the statute, required to perform work contained in this Project, and further, Excavator shall comply with all other requirements of this Statute relative to Excavation.

3.2 PREPARATION

A. Prevent movement or settlement of adjacent structures scheduled to remain.

B. Provide bracing and shoring of adjacent structures scheduled to remain.

C. Protect existing landscaping materials, appurtenances and structures which are not to be removed or demolished.

D. Disconnect, cap, and remove designated utility lines, including electrical and mechanical services within demolition areas.

E. Cooperate and work with local utility company to provide removal and disconnection of designated electrical and mechanical services.

F. Mark location of disconnected utilities. Identify utilities and indicate capping locations on Project Record Documents.

3.3 DEMOLITION AND REMOVAL

A. Except where specified in other sections, all materials and equipment removed, and not reused or salvaged shall become property of the Contractor.

B. Demolish designated pavements and appurtenances in accordance with removal procedure and schedule.

C. Cease operations and notify Architect immediately if adjacent structures or landscape features appear to be endangered.

D. Do not resume operations until corrective measures have been taken.

E. Immediately remove demolished material from site unless approved demolition procedure and schedule submitted in accordance with this section provides otherwise.

F. Relics, antiques, and similar objects remain property of Owner.

G. Notify Architect prior to removal and obtain acceptance regarding method of removal.

H. Remove and promptly dispose of contaminated, vermin infested, or dangerous materials encountered.

I. Do not burn or bury materials on site.

J. Demolish and remove designated concrete pavement completely as indicated on Drawings.

K. Neatly saw cut pavement edges at right angle to surface to complete depth of pavement prior to shattering or mechanical removal.

L. Keep work sprinkled to minimize dust. Provide hoses and water main or hydrant connections for this purpose. Obtain permits and pay for water usage as required by Local Water Utility.

M. Backfill areas excavated, open pits, and holes caused as a result of demolition with Type A10 fill specified in 310516 - Aggregates.

N. Rough grade and compact areas affected by building demolition to maintain and blend site grades and contours as indicated on Drawings.

END OF SECTION 024113

SECTION 024114 – UTILITY ABANDONMENT AND REMOVAL

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Abandonment in place of existing below grade utility services including storm sewer piping system.

2. Disconnection and abandonment of below grade utility services at discharge point.

3. Removal of existing utility structures including but not limited to manholes, catch basins and storm inlets.

B. Related Sections:

1. Applicable provisions of Division 01 shall govern all work under this Section.

2. Section 310513 - Soils: Subsoil fill.

3. Section 310516 - Aggregates: Granular fill.

4. Section 024113 - Site Demolition: Demolition of designated sheds, pavements and fences.

5. Section 312317 – Site Excavation Backfill and Compaction: Backfilling of abandoned or removed utility service excavations.

6. Section 328400 – Site Irrigation System: Removal of designated existing irrigation sections associated with new construction.

1.2 REFERENCES

A. Standard Specifications for Sewer and Water Construction in Wisconsin, Sixth Edition, December 22, 2003.

1.3 SUBMITTALS AT COMPLETION OF WORK

A. Division 01 – Execution Requirements: Procedures for submittals; Record Drawings.

B. Record horizontal and vertical depth locations of pipe runs, connections, and utility structures abandoned.

C. Identify, indicate, and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

1.4 REGULATORY REQUIREMENTS

A. Conform to following codes as applicable to abandonment Work of this Project:

1. Standard Specifications for Sewer and Water Construction in Wisconsin, Sixth Edition, December 22, 2003.

B. Contractor shall comply with all local, state, and federal regulations applicable to Work of this Section.

C. Contractor shall comply with and be solely responsible for compliance with U.S. Department of Labor OSHA Part 1926 Safety and Health Regulations for Construction for this Work.

D. Contractor performing Work of this Section shall be solely responsible for identifying, furnishing, installing and maintaining equipment and materials required by State and Federal regulations to establish safe working conditions during Work of this Section.

PART 2 - PRODUCTS

2.1 MATERIALS FOR UTILITY ABANDONMENT IN PLACE

A. Sand Fill: Aggregate Type A12 as specified in Section 310516 - Aggregates.

B. Cellular Concrete Fill:

1. Blend of preformed foam with cement-sand grout slurry to produce a concrete having fresh weight per cubic foot of not less than 75 pounds.

2. Cement-sand slurry shall be proportioned to contain 8 bags of Type 1 or Type 1-A Portland cement per cubic yard.

3. Foam shall be similar or equal to Elastizell manufactured by Elastizell Corporation of America, Ann Arbor, Michigan.

C. Concrete Backfill:

1. Proportioned with 2.25 bags Type IA Portland Cement.

2. 6-cubic feet sand.

3. 12-cubic feet well graded aggregate with maximum size of 1-inch aggregate.

D. Bulkhead Concrete:

1. 3000 psi at 28 days.

2. 3/4-inch maximum aggregate size.

3. 4-inch slump.

4. 423 pounds Portland Cement Type IA per cubic yard.

E. Crushed Gravel: Free of friable material and debris; Type A2; as specified in Section 310516 - Aggregates.

F. Site Excavated (Spoil) or Imported Material: Type S1 and S2 as specified in Section 310513 - Soils:

1. Consisting of loam, clay, gravel, sands or mixtures, for use as non-structural fill, within non-paved and non-foundation areas of project.

2. Fill requires prior approval by Architect/Engineer upon written request from Contractor.

3. Fill shall be free of pavement fragments larger than three (3) inches, bituminous or concrete materials, vegetable or organic matter, all types of refuse and frozen material.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Utility services shall be maintained until abandonment work is authorized by Architect.

B. Contact Municipal Utility to identify and locate point of connection of utility lateral to site service line.

C. Verify Municipal Utility requirements for disconnection and abandonment of utility service at property line. Obtain necessary permits.

D. Utility structures including, but not limited to, manholes, cleanouts, inlets, catch basins, and similar appurtenances shall be removed to depth indicated on Drawings, but not less than 2 feet below finished grade.

3.2 NOTIFICATION

A. In accordance with Wisconsin Statute 182.0175, "Damage to Transmission Facilities," Excavator, as defined in 182.0175(1)(bm), shall be solely responsible to provide advance notice to "Diggers Hotline, Inc." (800-242-8511) not less than three working days prior to commencement of any Excavation, as defined in the statute, required to perform work contained in this Project, and further, Excavator shall comply with all other requirements of this Statute relative to Excavation.

3.3 STORM SEWER ABANDONMENT AND REMOVAL

A. Locate and identify alignment of storm sewer utility service lines on site and their connection to Public Utility.

B. Contractor shall uncover connection of utility at location indicated on Drawings.

C. Existing connection where storm sewer terminates in manhole shall be securely plugged to prevent entry of construction water and debris into municipal active system.

D. Contractor shall be responsible to verify that the plug(s) are in place at the end of each workday.

E. Contractor shall remove any water or debris from the terminal manhole as required but not less than once a week.

F. Sawcut clean vertical joint in pipe if joint is not present at point indicated on drawings.

G. Insert a Municipal Utility approved plug in end of utility lateral. Place a concrete bulkhead against end of plug and pipe.

H. Procedure for abandonment of storm sewer site lines and appurtenances.

1. Excavate, and dispose of properly off site, existing manholes and similar appurtenances completely from site service lines.

2. Fill completely, abandoned reaches of pipe lines, with blown sand.

3. Plug both ends of each reach of pipe with a watertight concrete bulkhead.

4. Backfill and compact excavations as specified.

3.4 STRUCTURE REMOVAL

A. Structures shall include manholes, inlets, catch basins, and clean-outs.

B. Remove designated manholes, inlets, catch basins, and clean-outs to depth specified.

3.5 BACKFILL AND COMPACTION

A. Backfill shall be placed and compacted in accordance with Section 312317 – Site Excavation, Backfill and Compaction.

3.6 FIELD QUALITY CONTROL

A. Division 01 - Quality Requirements: Field inspection and testing.

B. Request inspection prior to and during placing backfill.

END OF SECTION 024114

SECTION 024119 - SELECTIVE STRUCTURE DEMOLITION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:

1. Demolition and removal of selected portions of building or structure.
2. Demolition and removal of selected site elements.
3. Salvage of existing items to be reused or recycled.

B. Related Sections include the following:

1. Division 01 Section "Summary" for use of premises and Owner-occupancy requirements.
2. Division 01 Section "Temporary Facilities and Controls" for temporary construction and environmental-protection measures for selective demolition operations.
3. Division 01 Section "Cutting and Patching" for cutting and patching procedures.
4. Division 01 Section "Construction Waste Management and Disposal" for disposal of demolished materials.
5. Division 31 Section "Site Clearing" for site clearing and removal of above- and below-grade improvements.

1.3 DEFINITIONS

A. Remove: Detach items from existing construction and legally dispose of them off-site, unless indicated to be removed and salvaged or removed and reinstalled.

B. Remove and Salvage: Detach items from existing construction and deliver them to Owner.

C. Remove and Reinstall: Detach items from existing construction, prepare them for reuse, and reinstall them where indicated.

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

1.4 MATERIALS OWNERSHIP

A. Historic items, relics, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, doors, windows, hardware, woodwork, antiques, and other items of interest or value to Owner that may be encountered during selective

demolition remain Owner's property. Carefully remove and salvage each item or object in a manner to prevent damage and deliver promptly to Owner.

1.5 SUBMITTALS

A. Schedule of Selective Demolition Activities: Indicate the following:

1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity.
2. Interruption of utility services. Indicate how long utility services will be interrupted.
3. Coordination for shutoff, capping, and continuation of utility services.
4. Means of protection for items to remain and items in path of waste removal from building.

B. Inventory: After selective demolition is complete, submit a list of items that have been removed and salvaged.

C. Predemolition Digital Images or Photographs: Show existing conditions of adjoining construction and site improvements, including finish surfaces, that might be misconstrued as damage caused by selective demolition operations. Comply with Division 01 Section "Photographic Documentation." Submit before Work begins.

D. Landfill Records: Indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.

1.6 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Standards: Comply with ANSI A10.6 and NFPA 241.

C. Predemolition Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination."

1.7 WARRANTY

A. Existing Warranties: 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 (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that utilities 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 intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Architect.

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

A. Existing Services/Systems: Maintain services/systems indicated to remain and protect them against damage during selective demolition operations.

1. Comply with requirements for existing services/systems interruptions specified in Division 01 Section "Summary."

B. Service/System Requirements: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.

1. Owner will arrange to shut off indicated services/systems when requested by Contractor.
2. Arrange to shut off indicated utilities with utility companies.
3. If services/systems are required to be removed, relocated, or abandoned, before proceeding with selective demolition provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
4. Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit after bypassing.

a. Where entire wall is to be removed, existing services/systems may be removed with removal of the wall.

3.3 PREPARATION

A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

1. Comply with requirements for access and protection specified in Division 01 Section "Temporary Facilities and Controls."

B. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.

1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
4. Cover and protect furniture, furnishings, and equipment that have not been removed.
5. Comply with requirements for temporary enclosures, dust control, heating, and cooling specified in Division 01 Section "Temporary Facilities and Controls."

C. Temporary Shoring: Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.

1. Strengthen or add new supports when required during progress of selective demolition.

3.4 SELECTIVE DEMOLITION, GENERAL

A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:

1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.
5. Maintain adequate ventilation when using cutting torches.
6. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
7. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.

8. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
9. Dispose of demolished items and materials promptly.

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

3.5 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

A. Concrete: Demolish in small sections. Cut concrete to a depth of at least 3/4 inch (19 mm) at junctures with construction to remain, using power-driven saw. Dislodge concrete from reinforcement at perimeter of areas being demolished, cut reinforcement, and then remove remainder of concrete indicated for selective demolition. Neatly trim openings to dimensions indicated.

B. Concrete: Demolish in sections. Cut concrete full depth at junctures with construction to remain and at regular intervals, using power-driven saw, then remove concrete between saw cuts.

C. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, then remove masonry between saw cuts.

D. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, then break up and remove.

E. Air-Conditioning Equipment: Remove equipment without releasing refrigerants.

3.6 DISPOSAL OF DEMOLISHED MATERIALS

A. General: Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them in an EPA-approved landfill.

1. Do not allow demolished materials to accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
4. Comply with requirements specified in Division 01 Section "Construction Waste Management and Disposal."

B. Burning: Do not burn demolished materials.

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

3.7 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION 024119

SECTION 030130 – CONCRETE REHABILITATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Concrete reinforcement repair.

2. Concrete surface repair.

3. Concrete crack repair.

B. Related Sections:

1. Applicable provisions of Division 01 shall govern all work under this Section.

2. Section 033713 – Shotcrete.

3. Section 071800 – Traffic Coatings.

4. Section 079213 – Joint Sealers – Seating Structure.

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

A. Repair Surface:

1. Basis of Measurement for spalls and delaminations: By the square foot.

2. Basis of Payment: Includes surface preparation, reinforcement and concrete repair, and finishing.

3. Contract price shall include all stated repairs. Contract price shall be based upon estimated sizes and depths of repairs. Contractor shall be paid for actual quantity installed.

B. Crack Repair:

1. Basis of Measurement: By the linear foot.

2. Basis of Payment: Includes surface preparation, injection ports, repair materials, and surface finishing.

3. Contract price shall include all stated repairs. Contract price shall be based upon estimated sizes and depths of repairs. Contractor shall be paid for actual quantity installed.

1.3 REFERENCES

A. American Society for Testing and Materials (ASTM International):

1. ASTM A82 - Standard Specification for Steel Wire, Plain, for Concrete Reinforcement.

2. ASTM A615 - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.

3. ASTM A996 - Standard Specification for Rail-Steel and Axle-Steel Deformed Bars for Concrete Reinforcement.

4. ASTM C33 - Standard Specification for Concrete Aggregates.

5. ASTM C109 - Standard Test Method for Compressive strength of Hydraulic Cement Mortars (Using 2-in. or (50 mm) Cube Specimens).

6. ASTM C150 - Standard Specification for Portland Cement.

7. ASTM C260 - Standard Specification for Air-Entraining Admixtures for Concrete.

8. ASTM C293 - Standard Test Method for Flexural Strength of Concrete (Using Simple Beam With Center-Point Loading).

9. ASTM C404 - Standard Specification for Aggregates for Masonry Grout.

10. ASTM C882 - Standard Test Method for Bond Strength of Epoxy-Resin Systems Used With Concrete By Slant Shear.

B. American Welding Society (AWS):

1. AWS D1.4 - Structural Welding Code - Reinforcing Steel.

1.4 SUBMITTALS

A. Division 01 - Submittal Procedures: Submittal procedures.

B. Product Data: Submit product standards, physical and chemical characteristics, technical specifications, limitations, maintenance instructions, and general recommendations regarding each material.

C. Samples: Submit color samples for patches exposed to view in finished construction and required to match existing.

D. Manufacturer's Instructions: Submit mixing instructions.

E. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.

1.5 CLOSEOUT SUBMITTALS

A. Division 01 - Execution Requirements: Closeout procedures.

B. Project Record Documents: Accurately record actual locations of structural reinforcement repairs, and type of repair.

C. Operation and Maintenance Data: Procedures for submittals.

1.6 QUALITY ASSURANCE

A. Perform welding work in accordance with AWS D1.4.

1.7 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum five years documented experience.

B. Applicator: Company specializing in concrete repair with minimum five years documented experience and approved by manufacturer.

1.8 MOCK-UP

A. Division 01 - Quality Requirements: Requirements for mockup.

B. Construct mockup panel 3 feet long by 1 foot wide, illustrating patching method, color and texture of repair surface.

C. Prepare one mockup of each type of injection and patching procedure.

D. Locate where directed by Engineer.

E. Incorporate accepted mockup as part of Work.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Division 01 - Product Requirements: Product storage and handling requirements.

B. Comply with instructions for storage, shelf life limitations, and handling.

PART 2 - PRODUCTS

2.1 EPOXY ADHESIVE INJECTION MATERIALS

A. Manufacturers:

1. Sika Corporation: Series Sikadur 35.

2. Substitutions: In accordance with Division 01 - Product Requirements.

B. Epoxy Adhesive: Two-part epoxy adhesive containing 100 percent solids, meeting the following minimum characteristics:

	Characteristic	Test Method	Results
1.	Bond Strength	ASTM C882	2,700psi
2.	Tensile Strength	ASTM D638	6,600psi
3.	Elongation	ASTM D638	2 percent at 7 days 70 degrees F
4.	Flexural Strength	ASTM D790	8,000psi
5.	Compressive Strength	ASTM D695	6,500psi

2.2 CEMENTITIOUS MORTAR MATERIALS

A. Manufacturers:

1. LA 40 Repair Mortar
2. Master Builders Emaco S66 CI.
3. Master Builders Emaco R310 CI.
4. Substitutions: Division 01 - Product Requirements.

B. Cementitious Mortar: Packaged patching mortar with the following properties:

1. Compressive Strength: ASTM C109/C109M; minimum 2,000 psi after one day and 5,000 psi after 28 days.
2. Bond Strength: ASTM C882; minimum 2,000 psi after 28 days.
3. Flexural Strength; ASTM C293; minimum 1,500 psi after 28 days.

C. Bonding Agent: As recommended by mortar supplier.

2.3 REINFORCEMENT MATERIALS

A. Reinforcing Steel: ASTM A615/A615M, 60 ksi yield grade billet-steel deformed bars, unfinished finish.

B. Reinforcing Wire: ASTM A82, 70 ksi yield plain wire.

2.4 ANTI-CORROSION COATING

A. Sika Armatec 110 EpoCem

B. Substitutions – Division 01 – Product Requirements

2.5 THIN SET OVERLAY

A. Tamms Thin Patch

B. Substitutions - Division 01-Product Requirements

2.6 MIXING CEMENTITIOUS MORTAR

A. Mix cementitious mortar to consistency required for purpose intended.

B. Provide bonding agent as additive to mix as recommended by manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Division 01 - Administrative Requirements: Coordination and project conditions.

B. Verify surfaces are ready to receive work.

C. Beginning of installation means acceptance of substrate.

D. Protect existing building. Repair any damage to building caused by Work of this contract.

3.2 PREPARATION

A. Clean concrete surfaces of dirt, laitance, corrosion, or other contamination; wire brush using water; rinse surface and allow to dry.

B. For cracked to be epoxy injected, flush out cracks and voids with water to remove laitance and dirt. Chemically neutralize by rinsing with water.

C. Provide temporary entry ports spaced to accomplish movement of fluids between ports; no deeper than depth of crack to be filled or port size diameter no greater than thickness of crack. Provide temporary seal at concrete surface to prevent leakage of adhesive.

D. For areas patched with cementitious mortar remove all deteriorated concrete, dirt, oil, grease, and all bond inhibiting material from the surface. Be sure the repair area is not less than 1/8-inch in depth. Preparation work should be done by pneumatic chipping hammer 15 pounds or less, or other approved mechanical means, to obtain an aggregate fractured surface with minimum surface profile of $\pm$ 1/16-inch.

If a reinforcing bar is exposed for half its diameter or ore, or if its bond to the adjacent concrete is broken, then the remaining concrete around the bar shall be removed to provide a minimum clearance of ¾-inch between the bar and the concrete.

The exposed reinforcing and exposed fractured concrete surface shall be thoroughly cleaned by sandblasting. Treat reinforcement with anti-corrosion coating.

3.3 REPAIR WORK

A. Repair reinforcement by lap splicing new bar reinforcement to existing reinforcement.

B. Repair exposed structural, shrinkage, and settlement cracks of concrete as indicated on

Drawings by epoxy injection method.

C. Apply bonding agent to existing concrete surface.

D. Repair spalling. Fill voids flush with surface. Apply surface finish.

3.4 INJECTION - EPOXY RESIN

A. Inject epoxy resin adhesive into prepared ports under pressure using equipment appropriate for particular application.

B. Begin injection at lower entry port and continue until adhesive appears in adjacent entry port. Continue from port to port until entire crack is filled.

C. Remove temporary seal and excess adhesive.

D. Clean surfaces adjacent to repair and blend finish.

3.5 APPLICATION - CEMENTITIOUS MORTAR

A. Apply spray or brush coating of bonding agent to concrete surfaces. Provide full surface coverage.

B. Apply cementitious mortar by steel trowel to average thickness of 3 inches. Tamp into place filling voids at spalled areas.

C. Damp cure cementitious mortar as recommended by mortar supplier.

3.6 FIELD QUALITY CONTROL

A. Division 01 - Quality Requirements: Testing, inspection and analysis requirements.

B. Contractor shall have a competent, technical representative of the manufacturer of the concrete repair products on the site at the beginning of the work to approve in writing that preparation and application of the materials is in accordance with the manufacturer's recommendations. Work shall not begin until such approval is submitted to the Engineer.

3.7 SCHEDULE

A. Project Manual 2: Structural Repair Manual.

END OF SECTION 030130

SECTION 033000 - CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Formwork, shoring, bracing, and anchorage.
2. Concrete reinforcement and accessories.
3. Cast-in-place concrete.
4. Curing and Treatment Requirements.

B. Related Sections:

1. Applicable provisions of Division 01 shall govern all work under this Section.
2. Section 079213 - Sealants: Backer rod and sealant for construction joints.

1.2 REFERENCES

A. American Concrete Institute (ACI):

1. ACI 117 - Specifications for Tolerances for Concrete Construction and Materials.
2. ACI 301 - Specifications of Structural Concrete for Buildings.
3. ACI 304.2R - Placing Concrete by Pumping Methods.
4. ACI 305 - Hot Weather Concreting.
5. ACI 306 - Cold Weather Concreting.
6. ACI 315 - Details and Detailing of Concrete Reinforcement.
7. ACI 318 - Building Code Requirements for Reinforced Concrete.

B. American Society for Testing and Materials (ASTM International):

1. ASTM A185 - Welded Steel Wire Fabric for Concrete Reinforcement.
2. ASTM A615 - Deformed and Plain Carbon-Steel for Concrete Reinforcement.
3. ASTM C33 - Concrete Aggregates.
4. ASTM C94 - Ready-Mixed Concrete.
5. ASTM C150 - Portland Cement.

6. ASTM C260 - Air Entraining Admixtures for Concrete.

7. ASTM C309 - Liquid Membrane-Forming Compounds for Curing Concrete.

8. ASTM C494 - Chemical Admixtures for Concrete.

9. ASTM C618 - Fly Ash as Admixture for Concrete.

10. ASTM D2103 - Polyethylene Film and Sheeting.

1.3 SUBMITTALS

A. Submit shop drawings of reinforcing steel under provisions of Division 01.

B. Initial submittal of reinforcement shop drawings shall be complete. No partial submittals will be accepted.

C. Indicate reinforcement sizes, spacings, locations and quantities of reinforcing steel, and wire fabric, bending and cutting schedules, splicing, supporting and spacing devices.

D. Reinforcement placement shop drawings for foundations and walls shall conform to ACI SP-66 providing full wall elevations.

E. Submit proposed mix design of each class of concrete to Architect/Engineer not later than ten days after Notice to Proceed.

1.4 QUALITY ASSURANCE

A. Perform work in accordance with ACI 301, 305, 306.

B. Maintain copy of ACI 301 on site.

1.5 REGULATORY REQUIREMENTS

A. Conform to requirements of local, state and federal rules and regulations applicable to Work and Project location.

1.6 ENVIRONMENTAL REQUIREMENTS

A. Placement and curing of concrete where (1) average daily temperature for three consecutive days is less than 40-degrees F, and (2) air temperature is not greater than 50 degrees F for more than one-half of a 24-hour period from midnight to midnight shall be in accordance with ACI 306.

B. Placement and curing of concrete subject to a combination of rising air temperature (generally greater than 75 degrees F) and low relative humidity and wind shall be in accordance with ACI 305.

PART 2 - PRODUCTS

2.1 FORM MATERIALS

A. Plywood Forms: Douglas Fir or Spruce-Pine-Fir species: sound, undamaged sheets with clean true edges, exterior glue, facing material to provide finish specified.

B. Lumber: Douglas Fir or Spruce species; construction grade or better; with grade stamp clearly visible.

C. Preformed Steel Wall Forms: Minimum 16 gage thick, matched, tight fitting, stiffened to support weight of concrete without deflection detrimental to tolerances and surface appearance.

D. Tubular Column Type: Round, spirally wound laminated fiber material; inside surface treated with release agent.

E. Form Ties For Exposed Surfaces: Plastic cone snap ties with 1-inch outside diameter by 1-inch (nominal) long cones, with no metal within 1-inch of concrete face after removal;

1. Manufacturers:

a. Dayton-Richmond.

b. Symons Corporation.

c. Simplex Form System Co.

F. Form Ties For Hidden Surfaces: Metal spreader type, removable to a depth of 1-inch from concrete face:

1. Manufacturers:

a. Dayton-Richmond.

b. Symons Corporation.

c. Simplex Form System Co.

2.2 REINFORCING STEEL

A. Reinforcing Steel: ASTM A615, 60 ksi yield grade billet steel deformed bars; uncoated finish.

B. Welded Steel Wire Fabric: Plain type, ASTM A185 in flat sheets; uncoated.

2.3 FIBER REINFORCEMENT

A. Synthetic Fiber: Fibrillated polypropylene fibers engineered and designed for use in concrete, complying with ASTM C 1116, Type III, 1/2 to 1-1/2 inches long.

1. Manufacturers - Fibrillated Fibers:

a. Fibrasol F; Axim Concrete Technologies.

b. Fibermesh; Fibermesh, Div. of Synthetic Industries.

c. Forta; Forta Corporation.

d. Grace Fibers; W. R. Grace & Co., Construction Products Div.

2.4 CONCRETE MATERIALS

A. Cement: ASTM C150, Portland, gray color.

B. Fine and Coarse Aggregates: ASTM C33.

C. Water: Clean and not detrimental to concrete.

2.5 CHEMICAL ADMIXTURES

A. Chemical admixtures shall be in accordance with ASTM C494.

B. Concrete may contain a Type A Water-reducing admixture, a Type D Water-reducing and retarding admixture.

C. Admixtures are to be used in accordance with manufacturer's recommendations.

D. Chemical admixtures containing chlorides, sulfides, or nitrides are not permitted.

E. A single manufacturer shall supply permitted admixtures.

F. Admixture manufacturer's are to be approved in writing by Architect/Engineer prior to use.

2.6 ADMIXTURES

A. Air Entrainment Admixture: ASTM C260.

B. Flyash: Class C in accordance with ASTM C618.

2.7 ACCESSORIES

A. Vapor Retarder: ASTM E1745; Class C, 10 mil minimum thickness, water vapor permeance rating of 0.050 perms or less;

1. Manufacturers:

a. W. R. Meadows - Type: Vapor-Mat.

b. Americover - Type: Vapor Block 10.

c. Fortifiber - Type: Moistop Ultra.

d. Stego Industries - Type: Stego Wrap 10-mil.

B. Flashing Reglets: Galvanized steel; longest possible lengths; alignment splines for joints; foam filled; release tape; sealed slots; securable to form work; Springlok, Type CO;

1. Manufacturers:

a. Fry Reglet Company.

b. Heckman Building Products, Inc.

c. Hohmann & Banard.

C. Form Release Agent: Colorless material which will not stain concrete, absorb moisture or impair natural bonding or color characteristics of coating, intended for use on concrete;

1. Manufacturers:

a. Symons Corporation - Type: Magic Kote VOC.

b. W. R. Meadows - Type: Duogard.

c. Degussa – Sonneborn - Type: Sonocrete Castoff.

d. Dayton Superior - Type: Clean Strip Ultra (J-3).

e. Substitutions: Not Permitted.

2.8 CURING AND TREATMENT MATERIALS

A. Water: Potable and clean.

B. Evaporation Retardant: Thin monomolecular film to reduce rapid moisture loss from the concrete surfaces prior to curing;

1. Manufacturers:

a. W. R. Meadows - Type: Evapre.

b. Degussa -Master Builders - Type: Confilm.

C. Curing Compound: ASTM C309, Type I, free of oil, wax, or grease;

1. Manufacturers:

a. W. R. Meadows - Sealtight – Type: 1100-Clear.

b. Dayton Superior - Type: Day-Chem Rez Cure (J-11-W).

c. Symons Corporation - Type: Resi-Chem Clear.

d. Substitutions: As approved by Engineer.

D. Curing and Sealing Compound: ASTM C309; Type I free of oil, wax, or grease;

1. Manufacturers:

a. W. R. Meadows - Sealtight; Type: Vocomp-20.

b. Dayton Superior; Type: Safe Cure & Seal (J-18).

c. Symons Corporation - Type: Cure & WB.

d. Degussa - Sonneborn : Kure-N-Seal

e. Substitutions: As approved by Engineer.

2. Hardeners and sealer used shall be of same manufacturer.

E. Curing Compound (Exterior Use Only): ASTM C309; Type II white pigmented;

1. Manufacturers:

a. W. R. Meadows - Type: 1200-White.

b. Dayton Superior - Type: Day Chem White Pigmented Cure (J-8).

c. Symons Corporation - Type: Resi-Chem White.

d. Substitutions: As approved by Engineer.

2. Hardeners and sealer used shall be of same manufacturer.

F. Sealers:

1. Manufacturers:

a. W. R. Meadows - Type: Tiah

b. Symons Corporation - Type: Decorative Sealer WB.

c. Dayton Superior - Type: Safe Seal (J-24).

d. Degussa-Sonneborn - Type: Kure-N-Harden.

e. TK Products - Type: Bright Seal.

f. Substitutions: As approved by Engineer.

2. Hardeners and sealer used shall be of the same manufacturer.

G. Polyethylene Film: ASTM C171, 6 mil thick, clear.

H. Burlap shall be clean, evenly woven, free of encrusted concrete or other contaminating materials, and shall be reasonably free of cuts, tears, broken or missing areas.

2.9 CONCRETE MIX

A. Mix concrete in accordance with ASTM C94.

B. Schedule of Mixes:

Class	Name	Max. Agg. Size (in.)	Min. Comp. Max. Slump** (inch)	Min. Cement Lbs/cu.yd.	Strength (psi/28 days)	Max. Water/ Cement Ratio
1	Footings, Pile Caps	1-1/2	4	423 517	3000 4000	
3	Columns	3/4	5	564	4000	0.50
4	Foundation Walls, Beams, Joists, Walls	3/4	4	541	4000	0.48
5	Slab-on-Grade	3/4	3	541	4000	0.46
6	Bond Beams and Masonry Fill	3/8	5	517	3000	
7	Stair Pans and Landings	3/8	3	588	4000	0.48
8*	Exterior Walks Curbs, Equipment Pads	3/4	3	517	3500	0.48

* Air Entrained Concrete Mix. Normal Acceptable range of air content 5%-7%.

**Slump Tolerance 3 and 4 inch slump plus 1 inch minus 1/2 inch.
5 inch slump plus or minus 1 inch

C. Concrete mix designs shall be designed and submitted in accordance with Division 01 and included as part of cost of this Work.

D. Mix designs shall be prepared by a qualified agency acceptable to Architect/Engineer. Six (6) copies of mix designs shall be submitted for Architect/Engineer's review prior to placing any concrete.

E. Mix design shall indicate brands, types, and quantities of admixtures included, compressive strength, slump, sieve analysis for fine and coarse aggregate, quantities of all ingredients, type and brand of cement, source of aggregate, whether fine aggregate is natural or manufactured.

F. Design of mix shall assure placing and finishing characteristics that meet Project requirements.

G. Mix designs contained in the Schedule of Mixes may be modified and submitted to Engineer for approval, by use of mid or high range water reducing agents to control slumps required for pumping of concrete. Strength, placing and finishing requirements shall be maintained.

H. Minimum cement contents listed in Schedule of Mixes are based on use of water reducing agents specified. Mixes without water reducing agents will require a 12 percent increase in cement content.

I. Cement content for mixes 1 and 2 may be reduced by 1/2 sack per cubic yard if 100 pounds of fly ash is added to each cubic yard of concrete.

J. Minimum cement content in mixes 3 thru 8 may be reduced by 1 sack per cubic yard if 100 pounds of fly ash is added to each cubic yard of concrete.

PART 3 - EXECUTION

3.1 FORMWORK ERECTION

A. Verify lines, levels, and measurement before proceeding with formwork.

B. Earth forms are not permitted.

C. Align form joints.

D. Do not apply form release agent where concrete surfaces receive special finishes or applied coatings which may be affected by agent.

E. Coordinate work of other Sections in forming and setting openings, slots, recesses, chases, sleeves, bolts, anchors, and other inserts.

3.2 REINFORCEMENT

A. Place, support, and secure reinforcement against displacement.

B. Locate reinforcing splices as shown on Drawings.

C. Damage to rebar coating as a result of bending shall be repaired with equivalent coating.

3.3 PLACING CONCRETE

A. Notify Architect/Engineer a minimum of 24 hours prior to commencement of concreting operations.

B. Failure to notify Architect/Engineer may result in rejection of concrete placed without observation.

C. If specified, install vapor barrier under interior floor on fill.

D. Lap joints of vapor barrier minimum 6 inches and seal.

E. Do not disturb vapor barrier while placing reinforcement.

F. Place concrete in accordance with ACI 301.

G. Place pumped concrete in accordance with ACI 304.2R. Line coating mix to initiate pumping shall not be used in pour but shall be wasted.

H. Ensure reinforcement and embedded items are not disturbed during concrete placement.

I. Concrete will be rejected and replaced at no cost to OWNER which has excessive honeycomb or embedded debris.

J. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures and mechanical injury.

K. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.

3.4 FLOOR SLABS

A. Place floor slabs on grade with control and construction joints as shown on Drawings.

B. Saw cut control joints within 24 hours after finishing of slab.

C. Cut slabs with 3/16-inch thick blade, cutting 1/4 of depth of slab thickness.

D. Joints between adjacent pours shall be butt joints with #4 by 2-foot tie bars.

E. Separate slabs on fill from vertical surfaces with joint filler.

F. Extend joint filler from bottom of slab to within 1/8-inch of finished slab surface.

G. Floor Finishes shall be in accordance with ACI 302, Floor Classifications and as follows:

1. Class 3 Exterior walks, driveways, garage floors, sidewalks - Broom.

2. Class 4 Institutional and Commercial - Trowel.

H. Immediately after finishing, begin curing.

3.5 FLOOR TREATMENT

A. Verify compatibility of floor treatment materials with mastics and finish materials to be applied to floor.

B. Apply two coats of curing and sealing compound, with first coat applied immediately after finishing and second coat just before final acceptance of building except where floor covering materials are to be applied.

C. Apply a liquid hardener and sealer with a damp or moist cure where no floor covering material is specified and floor is subject to moderate traffic and composition or rubber wheels.

D. Apply a non-slip aggregate to stair treads and landings, and ramps not scheduled to receive floor covering, in accordance with manufacturer's instructions, trowel to a hard finish, and treat surface with liquid hardener without sealer.

3.6 REPAIR OF VERTICAL SURFACE DEFECTS

A. Upon stripping of forms, vertical surfaces shall be inspected for defects caused by surface air voids, honeycombing, form tie holes, peeling, and fins.

B. Surface air voids shall be repaired with a unit packaged mixture of sand and cement mixed on job site with water and a unit of acrylic. Mixture shall be brushed uniformly on to surface and into voids. Where surface is to be exposed, surface finish of repair shall match adjacent surface.

C. Honeycombed and other defective concrete shall be removed down to sound concrete and patched as follows:

1. If chipping is necessary, edges shall be perpendicular to surface or slightly undercut. No feather edges shall be permitted.

2. Wet area extending at least 6 inches beyond area to be patched to prevent water from being absorbed by patching mortar.

3. Prepare a bonding grout using a mix of approximately 1 part cement to 1 part fine sand passing a No. 30 mesh sieve, mix to a consistency of thick cream, brush well into surface to be repaired.

4. Patch mixture shall be made of same material in same proportions as used for concrete except coarse aggregate shall be omitted and mortar shall consist of not more than 1 part cement to 2-1/2 parts sand by damp loose volume. White portland cement may be substituted for a part of grey cement to produce a color to match adjacent concrete by a trial patch. Mixing water quantity shall be no more than necessary for handling and placement.

5. Patching mortar shall be mixed in advance and allowed to stand with frequent manipulation with trowel, without addition of water, until it has reached stiffest consistency that will permit placement.

6. Brush bond coat into surface after surface water has evaporated from area to be patched. When bond coat begins to lose water sheen, apply premixed patching mortar. Mortar shall be thoroughly consolidated into place and struck off to leave patch slightly higher than surrounding surface.

7. Leave patch undisturbed for at least one hour before final finish to permit initial shrinkage. Patched area should be kept damp for seven days. Metal tools shall not be used for finishing a patch in a vertical surface which will be exposed.

D. Honeycombing found to be excessive upon inspection to an extent which compromises structural integrity of vertical member, shall be rejected at discretion of Architect/Engineer and vertical member replaced to extent directed by Architect/Engineer.

E. Tie holes shall be plugged. Tie hole shall be thoroughly wetted and packed solid and tight with mortar. Finish in exposed areas to be patched to match adjacent area.

F. Fins and burrs remaining after removal of forms should be chipped off and surface rubbed or ground even.

G. Stains, rust, efflorescence, and surface deposits considered objectionable on exposed surfaces shall be removed by methods acceptable by Architect/Engineer.

3.7 FINISHING OF FORMED SURFACES

A. After removal of forms and repair of defects, surfaces of concrete shall be given finishes specified below.

B. When finish is to match a sample furnished to Contractor, sample finish shall be reproduced on an area at least 100 square feet in size in an inconspicuous location designated by Architect/Engineer prior to application in the specified area. Application of finish shall not be made until approved by Architect/Engineer.

C. Rough Form Finish: Surface left with texture imparted by forms; form facing material not specified; tie holes and defects shall be patched; fins exceeding 1/4-inch shall be chipped or rubbed off.

D. Smooth Form Finish: Surface produced by form facing material shall be a smooth, hard, uniform texture on concrete; forms may be plywood, tempered form grade hardboard, metal, plastic, paper or other acceptable material capable of producing finish; arrangement of facing material shall be orderly and symmetrical with number of seams kept to practical minimum; forms supported to prevent deflection and to maintain tolerances; tie holes and defects shall be patched; all fins shall be removed.

1. Smooth Rubbed Finish: produced on newly hardened concrete no later than day following form removal and after defects repaired; surface wetted and rubbed with carborundum brick or other abrasive until uniform color and texture are produced; no cement grout used other than cement paste drawn from concrete itself by rubbing process.

E. Tops of walls or buttresses, horizontal offsets, and similar unformed surfaces occurring adjacent to formed surfaces shall be struck smooth after concrete is placed and shall be floated to a texture reasonably consistent with that of formed surface.

F. Final finish on formed surfaces shall continue uniformly across unformed surfaces.

G. Where a schedule of finishes is not included in this Section, or finishes are not shown on Drawings, the following finishes shall be used as applicable: Rough Form Finish for all concrete surfaces not exposed to public view; Smooth Form Finish with Smooth Rubbed Finish for all concrete surfaces exposed to public view.

3.8 TOLERANCES

A. Tolerances for concrete work shall be in accordance with ACI 117.

3.9 FIELD QUALITY CONTROL

A. Testing and analysis of concrete will be performed under provisions of Division 01.

B. Testing firm hired by contractor will take cylinders and perform slump and air entrainment tests in accordance with ACI 301.

C. Three concrete test cylinders shall be taken from each increment of 100 cubic yards of each class of concrete placed each day or from each pour of each Class if less than 100 cubic yards.

D. One additional test cylinder will be taken during cold weather and be cured on site under same conditions as concrete it represents.

E. One slump test will be taken for each set of tests cylinders taken.

3.10 PREPARATION OF EXISTING WORK

A. Drill holes in existing concrete, insert steel dowels and pack with non-shrinking grout where new concrete is doweled to existing concrete work.

B. Prior to placement of new concrete clean with steel brush and apply bonding agent in accordance with manufacturer's instructions.

3.11 CONCRETE FINISH SCHEDULE

A. Floor Finish Office Area:

1. Foundation walls below grade: Rough Form Finish.

2. Foundation walls exposed: Smooth Form Finish-Grout cleaned finish.

3. Interior Columns: Smooth Formed Finish-Smooth rubbed finish.

END OF SECTION 0330000

SECTION 033713 - SHOTCRETE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

This section includes all labor, material equipment and related services necessary for shotcrete application. This section is applicable only at the underside of the seating and is provided as a contractor option to Section 030130 - Concrete Rehabilitation.

1. Pneumatically applied concrete.

B. Related Sections:

1. Applicable provisions of Division 01 shall govern all work under this Section.

2. Section 031100 - Concrete Forms and Accessories: Prepared forms to achieve configuration, contours, and tolerances required.

3. Section 030130 - Concrete Rehabilitation

4. Section 079213 - Joint Sealers for Seating Structure.

1.2 REFERENCES

A. American Concrete Institute (ACI):

1. ACI 506.2 - Specification for Shotcrete.

B. American Society for Testing and Materials (ASTM International):

1. ASTM A185 - Standard Specification for Steel Welded Wire Fabric, Plain, for Concrete Reinforcement.

2. ASTM A497 - Standard Specification for Steel Welded Wire Fabric, Deformed, for Concrete Reinforcement.

3. ASTM C33 - Standard Specification for Concrete Aggregates.

4. ASTM C150 - Standard Specification for Portland Cement.

5. ASTM C260 - Standard Specification for Air-Entraining Admixtures for Concrete.

6. ASTM C330 - Standard Specification for Lightweight Aggregates for Structural Concrete.

7. ASTM C494 - Standard Specification for Chemical Admixtures for Concrete.

8. ASTM C309 – Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete

9. STM C1315 – Standard Specification for Liquid Membrane – Forming compounds having special properties for curing and sealing concrete.

1.3 SUBMITTALS

A. Division 01 - Submittal Procedures: Submittals procedures.

B. Product Data: Submit data on premixed shotcrete.

1.4 QUALITY ASSURANCE

A. Perform Work in accordance with ACI 506.2.

1.5 QUALIFICATIONS

A. Applicator: Company specializing in performing the Work of this section with minimum five years experience and approved by manufacturer.

1.6 MOCK-UP

A. Division 01 - Quality Requirements: Requirements for mockup.

B. Construct mock-up of sufficient size to indicate special treatment or finish required.

C. Locate where directed by Architect/Engineer.

D. Incorporate accepted mockup as part of Work.

1.7 PRE-INSTALLATION MEETINGS

A. Division 01 - Administrative Requirements: Pre-installation meeting.

B. Convene minimum one week prior to commencing work of this section.

1.8 ENVIRONMENTAL REQUIREMENTS

A. Division 01 - Product Requirements: Environmental conditions affecting products on site.

B. Maintain material and surrounding air temperature at minimum 50 degrees F prior to and during installation, and maintain material at this minimum temperature for 7 days after completion of Work. Furnish equipment and cover to maintain minimum temperature.

C. Suspend shotcrete operations during high winds, rainy weather, or near freezing temperatures when Work cannot be protected.

1.9 COORDINATION

A. Division 01 - Administrative Requirements: Coordination and project conditions.

B. Coordinate the Work with associated items placed within shotcrete work.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Shotcrete Mix:

1. ShotPatch 21F

2. Specpatch

B. Water: Clean, potable, and not detrimental to shotcrete

C. Curing Compound: Not detrimental to application of subsequent surface finish materials and must. comply with the moisture-retention requirements of ASTM C309 or ASTM C1315 or else moist cure for a minimum of 7 days.

D. Bonding Agent: as required by shotcrete material manufacturer.

E. Alignment Wire: Small gage, high strength steel wire.

2.2 SOURCE QUALITY CONTROL

A. Division 01 - Quality Requirements: Testing, inspection and analysis requirements.

B. Test samples in accordance with ACI 506.2.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Division 01 - Administrative Requirements: Coordination and project conditions.

B. Verify conditions are acceptable and are ready to receive work.

C. Verify field measurements are as shown on Drawings.

D. Ensure correct placement of reinforcement and sufficient clearance exists around reinforcement to permit complete encasement.

E. Ensure easy access to shotcrete surfaces for screeding and finishing, and to permit uninterrupted application.

3.2 PREPARATION

A. Remove existing unsound concrete from substrate surfaces.

B. Clean surfaces to receive shotcrete.

C. Determine operating procedures for placement in close quarters, extended distances, or around unusual obstructions where placement velocities and mix consistency may be adjusted during application.

D. Clean and wet cementitious or absorptive substrate surfaces prior to receiving shotcrete. Keep porous surfaces damp for several hours prior to placement of shotcrete. Apply bonding agent if required by shotcrete material manufacturer.

E. Protect adjacent surfaces not receiving shotcrete.

3.3 ALIGNMENT CONTROL

A. Provide alignment wire to establish thickness and plane of required surfaces.

B. Install alignment wire at corners and offsets.

3.4 APPLICATION

A. Place reinforcement in accordance with ACI 506.2.

B. Use mixing and delivery equipment capable of thoroughly mixing shotcrete mix, and water in sufficient quantity to maintain continuous and uniform placement.

C. Do not place shotcrete on surfaces that are frozen, spongy, or where there is free water.

D. Achieve maximum compaction with minimum rebound.

E. Build-up to required thickness in multiple passes to achieve layering. Encase reinforcement with first pass.

F. Allow each layer to take initial set before applying succeeding layers.

G. Do not permit applied shotcrete to sag, slough, or displace.

H. After initial plastic set of final layer, remove excess material outside of forms and alignment lines.

I. Finish surface of final layer with steel trowel finish to match existing.

J. Remove rebound material which does not fall clear of work. Discard salvaged rebound.

K. Maintain shotcrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of shotcrete.

L. Immediately after placement, protect shotcrete from premature drying, excessively hot or cold temperatures, and mechanical injury.

M. Maintain surfaces wet for minimum of 7 days.

N. Sound test applied material with hammer for voids. Remove void areas and replace with new shotcrete ensuring full bond with adjacent work.

3.5 FIELD QUALITY CONTROL

A. Division 01 - Quality Requirements: Testing and Inspection Services.

3.6 PROTECTION OF INSTALLED WORK

A. Division 01 - Execution Requirements: Protecting installed work.

B. Do not permit applied work to damage adjacent surfaces.

END OF SECTION 033713

SECTION 04200 - UNIT MASONRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

B. Applicable provisions of Division I shall govern work of this section.

1.2 SUMMARY

A. This Section includes unit masonry assemblies consisting of the following:

1. Concrete masonry units.
2. Mortar and grout.
3. Reinforcing steel.
4. Masonry joint reinforcement.
5. Ties and anchors.
6. Embedded flashing.
7. Miscellaneous masonry accessories.

B. Products installed, but not furnished, under this Section include the following:

1. Hollow-metal frames in unit masonry openings, furnished under Division 8 Section "Steel Doors and Frames."

1.3 DEFINITIONS

A. Reinforced Masonry: Masonry containing reinforcing steel in grouted cells.

1.4 PERFORMANCE REQUIREMENTS

A. Provide masonry assembly that develops the following net-area compressive strength (f'm) at 28 days. Determine compressive strength of masonry by testing masonry prisms according to ASTM C 1314.

1. For Concrete Unit Masonry: f'm = 2000 psi (13.8 MPa).

1.5 SUBMITTALS

A. Product Data: For each different masonry unit, accessory, and other manufactured product specified.

B. Shop Drawings: Show fabrication and installation details for the following:

1. Reinforcing Steel: Detail bending and placement of unit masonry reinforcing bars. Comply with ACI 315, "Details and Detailing of Concrete Reinforcement."

C. Qualification Data: For firms and persons specified in "Quality Assurance" Article.

1.4 QUALITY ASSURANCE

A. Source Limitations for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, through one source from a single manufacturer for each product required.

B. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from one manufacturer for each cementitious component and from one source or producer for each aggregate.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store masonry units on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are dry.

1. Protect Type I concrete masonry units from moisture absorption so that, at the time of installation, the moisture content is not more than the maximum allowed at the time of delivery.

B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.

C. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

1.6 PROJECT CONDITIONS

A. Protection of Masonry: During construction, cover tops of walls, with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.

1. Extend cover a minimum of 24 inches (600 mm) down both sides and hold cover securely in place.

2. Where one wythe of multiwythe masonry walls is completed in advance of other wythes, secure cover a minimum of 24 inches (600 mm) down face next to unconstructed wythe and hold cover in place.

B. Do not apply uniform floor or roof loads for at least twelve (12) hours and concentrated loads for at least three (3) days after building masonry walls or columns.

C. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.

1. Protect base of walls from rain-splashed dirt and from mortar splatter by coverings spread on ground and over wall surface.
2. Protect surfaces of window and doorframes, as well as similar products with painted and integral finishes, from mortar droppings.
3. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt onto completed masonry.

D. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.

1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F (4 deg C) and above and will remain so until masonry has dried, but not less than 7 days after completing cleaning.

E. Hot-Weather Requirements: Protect unit masonry work when temperature and humidity conditions produce excessive evaporation of water from mortar and grout. Provide artificial shade and wind breaks and use cooled materials as required.

1. When ambient temperature exceeds 100 deg F (38 deg C), or 90 deg F (32 deg C) with a wind velocity greater than 8 mph (13 km/h), do not spread mortar beds more than 48 inches (1200 mm) ahead of masonry. Set masonry units within one minute of spreading mortar.

PART 2 - MATERIALS

2.1 CONCRETE MASONRY UNITS

A. General: Provide shapes indicated and as follows:

1. Provide special shapes for lintels, corners, jambs, sash, control joints, headers, bonding, and other special conditions.
2. Provide square-edged units for outside corners, unless indicated as bullnose.

B. Concrete Masonry Units: ASTM C 90 and as follows:

1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 2800 psi (19.3 MPa).
2. Weight Classification: Normal weight.
3. Provide Type I, moisture-controlled units.
4. Size (Width): Manufactured to the following dimensions:

a. 8 inches (203 mm) nominal; 7-5/8 inches (194 mm) actual.

5. Exposed Faces: Manufacturer's standard color and texture, unless otherwise indicated.

2.2. FACE BRICK: ASTM C 216, GRADE SW, TYPE FBX

A. Unit Compressive Strength: Provide units with minimum average net-area compressive strength to match existing brick.

B. Initial Rate of Absorption: Less than 30 g/30 sq. in. (30g/194 sq. cm) per minute whn tester per ASTM C 67.

C. Efflorescence: provide brick that has been tested according to ASTM c 67 and is rated "not effloresced."

D. Where shown to "match existing", provide face brick matching color range, texture, and size of existing adjacent brickwork.

2.3. MORTAR AND GROUT MATERIALS

A. Portland Cement: ASTM C 150, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.

B. Hydrated Lime: ASTM C 207, Type S.

C. Portland Cement-Lime Mix: Packaged blend of portland cement complying with ASTM C 150, Type I or Type III, and hydrated lime complying with ASTM C 207.

D. Mortar Cement: ASTM C 1329.

E. Aggregate for Mortar: ASTM C 144; except for joints less than 1/4 inch (6.5 mm) thick, use aggregate graded with 100 percent passing the No. 16 (1.18-mm) sieve.

F. Aggregate for Grout: ASTM C 404.

G. Cold-Weather Admixture: Nonchloride, noncorrosive, accelerating admixture complying with ASTM C 494, Type C, and recommended by the manufacturer for use in masonry mortar of composition indicated.

H. Water: Potable.

2.4. REINFORCING STEEL

A. Uncoated Steel Reinforcing Bars: ASTM A 615/A 615M; ASTM A 616/A 616M, including Supplement 1; or ASTM A 617/A 617M, Grade 60 (Grade 400).

2.5 MASONRY JOINT REINFORCEMENT

A. General: ASTM A 951 and as follows:

1. Hot-dip galvanized, carbon-steel wire for both interior and exterior walls.
2. Wire Size: W1.7 or 0.148-inch (3.8-mm) diameter.
3. Provide in lengths of not less than 10 feet (3 m), with prefabricated corner and tee units where indicated.

B. For single-wythe masonry, provide truss type with single pair of side rods and cross rods spaced not more than 16 inches (407 mm) o.c.

2.6 RIGID ANCHORS

A. General: Fabricate from steel bars as follows:
1. 1-1/2 inches (38 mm) wide by 1/4 inch (6.4 mm) thick by 24 inches (600 mm) long, with ends turned up 2 inches (50 mm) or with cross pins. U.N.O.
2. Finish: Hot-dip galvanized to comply with ASTM A 153.

2.7. MISCELLANEOUS ANCHORS

A. Unit Type Inserts in Concrete: Cast-iron or malleable-iron inserts of type and size indicated.

B. Anchor Bolts: Steel bolts complying with ASTM A 307, Grade A (ASTM F 568, Property Class 4.6); with ASTM A 563 (ASTM A 563M) hex nuts and, where indicated, flat washers; hot-dip galvanized to comply with ASTM A 153, Class C; of diameter and length indicated and in the following configurations:
1. Headed bolts.
2. Nonheaded bolts, bent in manner indicated.

C. Postinstalled Anchors: Anchors as described below, with capability to sustain, without failure, load imposed within factors of safety indicated, as determined by testing per ASTM E 488, conducted by a qualified independent testing agency.
1. Type: Expansion anchors.
2. Corrosion Protection: Carbon-steel components zinc plated to comply with ASTM B 633, Class Fe/Zn 5 (5 microns) for Class SC 1 service condition (mild).
3. For Postinstalled Anchors in Grouted Masonry Units: Capability to sustain, without failure, a load equal to six times the loads imposed.

2.8 EMBEDDED FLASHING MATERIALS

A. Metal Flashing: Provide metal flashing, where flashing is exposed or partly exposed and where indicated, complying with SMACNA's "Architectural Sheet Metal Manual" and as follows:

Stainless Steel: ASTM A 240/A 240M, Type 304, 0.016 inch thick.

B. Fabricate through-wall flashing with drip edge, unless otherwise indicated. Fabricate by extending flashing 1/2 inch out from wall, with outer edge bent down 30 degrees and hemmed.

C. Solder and Sealants for Sheet Metal Flashings:

Solder for Stainless Steel: ASTM B 32, Grade Sn60, with acid flux of type recommended by stainless-steel sheet manufacturer.

Elastomeric Sealant: ASTM C 920, chemically curing silicone sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.

2.8 MISCELLANEOUS MASONRY ACCESSORIES

A. Preformed Control-Joint Gaskets: Material as indicated below, designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.

1. Styrene-Butadiene-Rubber Compound: ASTM D 2000, Designation M2AA-805.
2. PVC: ASTM D 2287, Type PVC-65406.

2.9 MORTAR AND GROUT MIXES

A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures, unless otherwise indicated.

1. Do not use calcium chloride in mortar or grout.
2. Add cold-weather admixture (if used) at the same rate for all mortar, regardless of weather conditions, to ensure that mortar color is consistent.

B. Preblended, Dry Mortar Mix: Furnish dry mortar ingredients in the form of a preblended mix. Measure quantities by weight to ensure accurate proportions, and thoroughly blend ingredients before delivering to Project site.

C. Mortar for Unit Masonry: Comply with ASTM C 270, Proportion Specification.

D. Mortar for Unit Masonry: Comply with ASTM C 270 Property Specification.

1. Extended-Life Mortar for Unit Masonry: Mortar complying with ASTM C 1142 may be used instead of mortar specified above, at Contractor's option.
2. Limit cementitious materials in mortar to portland cement, mortar cement, and lime.
3. Limit cementitious materials in mortar for exterior and reinforced masonry to portland cement, mortar cement, and lime.
4. For reinforced masonry and where indicated, use Type S.
5. For exterior, above-grade, load-bearing and non-load-bearing walls and parapet walls; for interior load-bearing walls; for interior non-load-bearing partitions; and for other applications where another type is not indicated, use Type N.
6. For interior non-load-bearing partitions, Type O may be used instead of Type N.

E. Grout for Unit Masonry: Comply with ASTM C 476.

1. Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with Table 5 of ACI 530.1/ASCE 6/TMS 602 for dimensions of grout spaces and pour height.

2. Provide grout with a slump of 8 to 11 inches (200 to 280 mm) as measured according to ASTM C 143.

PART III- EXECUTION

3.1 INSTALLATION, GENERAL

A. Thickness: Build cavity and composite walls and other masonry construction to the full thickness shown. Build single-wythe walls to the actual widths of masonry units, using units of widths indicated.

B. Leave openings for equipment to be installed before completing masonry. After installing equipment, complete masonry to match the construction immediately adjacent to the opening.

C. Cut masonry units with motor-driven saws to provide clean, sharp, unchipped edges. Cut units as required to provide a continuous pattern and to fit adjoining construction. Where possible, use full-size units without cutting. Allow units cut with water-cooled saws to dry before placing, unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.

D. Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures.

1. Mix units from several pallets or cubes as they are placed.

E. Wetting of Brick: Wet brick before laying if the initial rate of absorption exceeds 30 g/30 sq. in. (30 g/194 sq. cm) per minute when tested per ASTM C 67. Allow units to absorb water so they are damp but not wet at the time of laying.

3.2 CONSTRUCTION TOLERANCES

A. Comply with tolerances in ACI 530.1/ASCE 6/TMS 602 and the following:

B. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/4 inch in 20 feet (6 mm in 6 m), nor 1/2 inch (12 mm) maximum.

C. For vertical alignment of exposed head joints, do not vary from plumb by more than 1/4 inch in 10 feet (6 mm in 3 m), nor 1/2 inch (12 mm) maximum.

D. For conspicuous horizontal lines, such as exposed lintels, sills, parapets, and reveals, do not vary from level by more than 1/4 inch in 20 feet (6 mm in 6 m), nor 1/2 inch (12 mm) maximum.

E. For exposed bed joints, do not vary from thickness indicated by more than plus or minus 1/8 inch (3 mm), with a maximum thickness limited to 1/2 inch (12 mm). Do not vary from bed-joint thickness of adjacent courses by more than 1/8 inch (3 mm).

F. For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8 inch (3 mm). Do not vary from adjacent bed-joint and head-joint thicknesses by more than 1/8 inch (3 mm).

3.3 LAYING MASONRY WALLS

A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.

B. Bond Pattern for Exposed Masonry: Lay exposed masonry in the following bond pattern; do not use units with less than nominal 4-inch (100-mm) horizontal face dimensions at corners or jambs.

1. Running Bond.

C. Stopping and Resuming Work: In each course, rack back one-half-unit length for one-half running bond or one-third-unit length for one-third running bond; do not tooth. Clean exposed surfaces of set masonry, wet clay masonry units lightly if required, and remove loose masonry units and mortar before laying fresh masonry.

D. Built-in Work: As construction progresses, build in items specified under this and other Sections of the Specifications. Fill in solidly with masonry around built-in items.

E. Fill space between hollow-metal frames and masonry solidly with mortar, unless otherwise indicated.

F. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath in the joint below and rod mortar or grout into core.

G. Fill cores in hollow concrete masonry units with grout 24 inches (600 mm) under bearing plates, beams, lintels, posts, and similar items, unless otherwise indicated.

H. Build non-load-bearing interior partitions full height of story to underside of solid floor or roof structure above, unless otherwise indicated.

1. Install compressible filler in joint between top of partition and underside of structure above.

3.3 MORTAR BEDDING AND JOINTING

A. Lay hollow masonry units as follows:

1. With full mortar coverage on horizontal and vertical face shells.

2. Bed webs in mortar in starting course on footings and in all courses of piers, columns, and pilasters, and where adjacent to cells or cavities to be filled with grout.

3. For starting course on footings where cells are not grouted, spread out full mortar bed, including areas under cells.

3.4 MASONRY JOINT REINFORCEMENT

A. General: Provide continuous masonry joint reinforcement as indicated. Install entire length of longitudinal side rods in mortar with a minimum cover of 5/8 inch (16 mm) on exterior side of walls, 1/2 inch (13 mm) elsewhere. Lap reinforcement a minimum of 6 inches (150 mm).

1. Space reinforcement not more than 16 inches (406 mm) o.c.

B. Cut or interrupt joint reinforcement at control and expansion joints, unless otherwise indicated.

C. Provide continuity at corners and wall intersections by using prefabricated "L" and "T" sections. Cut and bend reinforcing units as directed by manufacturer for continuity at returns, offsets, column fireproofing, pipe enclosures, and other special conditions.

3.5 CONTROL AND EXPANSION JOINTS

A. General: Install control and expansion joints in unit masonry where indicated. Build-in related items as masonry progresses. Do not form a continuous span through movement joints unless provisions are made to prevent in-plane restraint of wall or partition movement.

B. Form control joints in concrete masonry as follows:

1. Install preformed control-joint gaskets designed to fit standard sash block.

3.6 LINTELS

A. Provide masonry lintels where shown and where openings of more than 12 inches (305 mm) for brick-size units and 24 inches (610 mm) for block-size units are shown without structural steel or other supporting lintels.

1. Provide prefabricated or built-in-place masonry lintels. Use specially formed bond beam units with reinforcing bars placed as indicated and filled with coarse grout. Cure precast lintels before handling and installing. Temporarily support built-in-place lintels until cured.

B. Provide minimum bearing of 8 inches (200 mm) at each jamb, unless otherwise indicated.

3.7 REINFORCED UNIT MASONRY INSTALLATION

A. Temporary Formwork and Shores: Construct formwork and shores to support reinforced masonry elements during construction.

1. Construct formwork to conform to shape, line, and dimensions shown. Make it sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.

2. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and other temporary loads that may be placed on them during construction.

B. Grouting: Do not place grout until entire height of masonry to be grouted has attained sufficient strength to resist grout pressure.

1. Comply with requirements of ACI 530.1/ASCE 6/TMS 602 for cleanouts and for grout placement, including minimum grout space and maximum pour height.

3.8 REPAIRING, POINTING, AND CLEANING

A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Install new units to match adjoining units; install in fresh mortar, pointed to eliminate evidence of replacement.

B. Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and completely fill with mortar. Point up joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for sealant application.

C. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.

D. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:

1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
2. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing the surfaces thoroughly with clear water.
3. Clean concrete masonry by cleaning method indicated in NCMA TEK 8-2 applicable to type of stain on exposed surfaces.

END OF SECTION

SECTION 071800 – TRAFFIC COATINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. The furnishing of all labor, materials, tools and equipment to perform the surface preparation and installation of a system consisting of a liquid applied elastomeric waterproof membrane and a chemical and abrasion resistant non-skid traffic topping incorporating selected aggregate.

2. Entire exterior exposed surface of Seating Structure to receive the waterproof membrane, including horizontal and vertical surfaces of concrete risers. Extend waterproofing membrane a minimum of 6 inches up interior face of the stadium's perimeter walls. Extend waterproofing into the vomitories to cover all exposed concrete. Extend waterproofing a minimum of 6 inches onto Low-Field wall.

B. Related Sections:

1. Applicable provisions of Division 01 shall govern all work under this Section.

2. Section 079213 - Joint Sealers – Seating Structure: Crack and Joint Sealants.

3. Section 030130 - Concrete Rehabilitation.

1.2 REFERENCES

A. American Society for Testing and Materials (ASTM International):

1. ASTM D903 - Standard Test Method for Peel or Stripping Strength of Adhesive Bonds.

2. ASTM D1044 - Standard Test Method for Resistance of Transparent Plastics to Surface Abrasion.

3. ASTM D1360 - Standard Test Method for Fire Retardancy of Paints (Cabinet Method).

4. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

5. ASTM E96 - Standard Test Methods for Water Vapor Transmission of Materials.

6. ASTM C957 – Standard Specification for High-Solids Content, Cold Liquid-Applied Elastomeric Waterproofing Membrane with integral wearing surface.

7. ASTM D822 – Standard Practice for conducting tests on paint & related coatings and materials using filtered open-flame carbon-arc exposure apparatus.

8. ASTM D2240 – Standard Test Method for Rubber Property Durometer Hardness.

9. ASTM D1004 – Standard Test Method for Initial Tear Resistance of Plastic Film and Sheeting.

B. Underwriters Laboratories Inc. (UL):

1. UL - Fire Resistance Directory.

1.3 SYSTEM DESCRIPTION

A. Elastomeric urethane coatings providing continuous, seamless waterproofing membrane resistant to specified traffic wear exposures meeting and exceeding ASTM C957.

B. Pedestrian (Light) Duty System: Multi-coat consisting of primer if required, waterproofing base coat, and an aggregate loaded finish top coat. The aggregate need only be supplied for horizontal surfaces.

1.4 SUBMITTALS

A. Division 01 - Submittal Procedures: Submittal procedures.

B. Product Data: Submit 2 copies of manufacturer's literature for all products furnished, appropriate material safety data sheets (MSDS) and other safety requirements.

C. Samples: Submit six, 1/4x2x2 inch plywood in size illustrating color, surface texture, and variations.

D. Applicator's License Certificate: Issued by the manufacturer, the certificate shall verify the applicator's qualifications to properly install the manufacturer's system. The certificate shall commit the manufacturer to the acceptance of the applicator under the joint and several warranty provisions required by this section. Submit an unsigned sample of the Warranty that will be used on the project.

E. Manufacturer's Installation Instructions: Submit special environmental conditions required to install the Product and shelf life of materials and products to be furnished and used on this project, type, volume and gradation of non-slip aggregate and potential incompatibilities with adjacent materials.

1.5 CLOSEOUT SUBMITTALS

A. Division 01 - Execution Requirements: Closeout procedures.

B. Operation and Maintenance Data: Upon completion of work required by this section, submit written maintenance recommendations, identified with project name, location and date, type of membrane coating system applied, and surface to which system was applied, including sketches where necessary. Include recommendations for periodic inspections, care and maintenance. Identify common causes of damage with instructions for temporary patching until permanent repair can be made.

C. Warranty: Submit manufacturer's warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.6 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum five years documented experience.

B. Installation Contractor: Authorized, approved and qualified by the manufacturer of materials used; having necessary equipment and facilities to fulfill requirements of this section. Minimum experience is three installations totaling at least 300,000 feet in areas with similar climates; 3 years of installation experience. At least 3 weeks prior to commencing work of this section, this contractor shall submit a list of prior projects showing evidence of experience. Include for each facility name and location, date, and square footage of installation, designation of system used, and the name and phone number of a representative of the owner familiar with the installation and material performance. Installer of the waterproof membrane shall be the same as the joint sealants.

1.7 MOCKUP

A. Division 01 - Quality Requirements: Requirements for mockup.

B. Construct mockup panel, 10 feet long by 10 feet wide, including membrane system applied to representative substrate.

C. Used as an example of the level of quality to be followed during the installation of the remainder of the waterproof membrane system. Used to gauge dry and wet film thicknesses for the various layers of the waterproof membrane system. Mock up panel should also demonstrate the procedures to be followed during the installation of the system.

D. Locate where directed by Engineer.

E. Incorporate accepted mockup as part of Work.

1.8 PRE-INSTALLATION MEETINGS

A. Division 01 - Administrative Requirements: Pre-installation meeting.

B. Convene minimum one week prior to commencing work of this section. Representatives from the Engineer, Contractor, Manufacturer, and Owner should attend this meeting.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Division 01 - Product Requirements: Product storage and handling requirements.

B. Deliver material in sealed, original packages or containers bearing name and brand of manufacturer and date manufactured. Upon delivery supplies will be checked by the engineer. Only materials brought to the area and approved may be used.

C. Maintain ambient storage temperature of 55 degrees F.

D. Store materials in single place designated by the engineer.

E. Keep away from fire or open flame. Store hazardous materials in accordance with local ordinances. Provide fire extinguishers in areas. Allow no smoking or open containers of

solvents. Store solvents in safety cans.

F. Manufacturer shall submit to the engineer a written statement of materials shelf life and proper storage conditions. Materials that have been improperly stored or that have an expired shelf life shall not be installed.

1.10 ENVIRONMENTAL REQUIREMENTS

A. Division 01 - Product Requirements.

B. Do not install materials when temperature is below 50 degrees F or above 90 degrees F without written permission from the manufacturer and the Engineer.

C. Maintain this temperature range, 24 hours before, during and 72 hours after application.

D. Restrict traffic from area where materials are being installed or are curing.

E. Membrane shall not be applied if weather is too cold, raining, or snowing or if any other conditions exist that will not permit proper application or curing of coating. Follow manufacturer's written directions. Protection required for proper installation and curing shall be the responsibility of the membrane contractor and shall be reflected in the bid.

1.11 WARRANTY

A. Division 01 - Execution Requirements: Product warranties and product bonds.

B. Materials Manufacturer and Installation Contractor shall be jointly and severally responsible and shall submit an affidavit signed by both parties warranting the installation system for a period of five years from date of final completion.

C. Warranty shall cover loss of waterproofing and loss of more than 20% of traffic topping aggregate and may exclude fire, structural failure, acts of God, or willful damage other than intended usage. The traffic topping will be deemed to have lost more than 20% of its aggregate when its thickness is less than 0.05 inches.

D. Tears, leaks and damaged or worn surfaces under warranty shall be repaired or replaced at no cost to the Owner within 8 months of notification of the Owner.

PART 2 - PRODUCTS

2.1 TRAFFIC MEMBRANE

A. Manufacturers:

1. Neogard Corp Peda-Gard System

2. Stellar-Mark Pro-Deck Medium Duty System

3. Sonneborn Building Products Sonoguard Coating Pedestrian System

4. Vulkem Slip-Resistant Pedestrian Deck Coating System 350/351

5. Substitutions: In accordance with Division 01 - Product Requirements

2.2 COMPONENTS

A. Membrane: Fluid applied polyurethane waterproof compound, conforming to the following:

Property	ASTM Test	Result
Tensile Strength	D412	750 psi. minimum
Moisture Vapor Permeability	E96	2.7 perms maximum
Bond Strength	D903	18 lb/in width minimum

B. Topping: Fluid applied Polyurethane compound, conforming to the following:

Property	ASTM Test	Result
Tensil Strength	D412	1500 psi minimum
Hardness	D2240	68 minimum
Elongation %	D412	250% minimum
Tear Strength	D1004	150 pli minimum
Abrasion Resistance	C501	0.030g maximum

The color of the wear coat and final top coat shall be light grey

C. Surface Primer: compatible with membrane compound, existing concrete surface, and joint sealants; as recommended by membrane manufacturer.

D. Detail Coat: Membrane base coat supplied by manufacturer applied 30 mils dry film thickness.

E. Aggregate: Silica sand or silicon carbide, uniformly graded, with mesh gradations as recommended by manufacturer.

F. Joint and Crack Sealant: As specified in Section 079213, acceptable to manufacturer. Installer of waterproof membrane is responsible for insuring supplied joint sealant is compatible with supplied membrane system.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Division 01 - Administrative Requirements: Coordination and project conditions.

B. Verify substrate is ready to receive work, free of frozen matter, dampness, loose particles, cracks, pits, projections, penetrations or foreign matter detrimental to adhesion or application of waterproofing system.

C. Verify that substrate surfaces are smooth, free of honeycomb or pitting, and not detrimental to full contact bond of waterproofing materials.

D. Do not begin work until concrete substrate has cured 14 days, minimum, and measured moisture content is not greater than 16 percent.

E. Commencement of coating installation implies acceptance of slab surface as suitable for application of coating system.

3.2 PROTECTION

A. Protect adjacent surfaces and materials with covering, masking, drop cloths, etc. as required during surface preparation and coating application. Upon completion, remove protection and clean. Surfaces soiled or damaged by surface preparation or special coating shall be cleaned or replaced at no cost to Owner.

B. Seal all floor drains completely prior to membrane installation. Drains clogged by new membrane materials will be cleaned out at the Contractor's expense. Remove seals after membrane installation. Trim around drains for proper fit of drain gratings.

3.3 PREPARATION

A. Clean substrate surface free of oil, grease, dirt, paint, etc. by mechanical means, and prepare according to manufacturer's written directions. Submit materials to be used and method for cleaning for review prior to preparation.

B. Patch concrete substrate with filler to produce surface conducive to bond.

3.4 INSTALLATION

A. Apply system materials by a manufacturer's approved contractor in strict accordance with the manufacturer's written specifications. All procedures for installation shall comply with recommendations of manufacturer of product being used.

B. Apply primer to prepared substrate to dry film thickness of 5 mils.

C. Cold joints and visible hairline cracks (up to 1/16 inch in width) shall be cleaned, primed, and treated with a detail coat a minimum distance of 2 inches on each side of the crack or joint.

D. Large visible cracks (1/16" or greater in width) shall be routed and sealed with a sealant approved by the membrane supplier. Sealant shall be supplied to the inside area of the crack only. Sealed cracks shall be cleaned, primed, and treated with a detail coat a minimum distance of 2 inches on each side of the crack.

E. When primer is tack free, apply one base coat of membrane in strict accordance with the manufacturer's latest instructions. Membrane base coat shall be applied to total minimum dry film thickness of 25 mils.

F. Following application and curing of waterproof membrane base coat, apply a final coating having a minimum of 15 mils dry film thickness. Final coating shall be squeegeed and backrolled to ensure uniform thickness. While final coating is still fluid, uniformly apply aggregate into coating and backroll as required to obtain an integral aggregate wear resistance system.

G. Following curing of the final coating, remove the excess aggregate.

H. Pedestrian (Light) Duty system coating shall be non-skid, abrasion resistant, integral aggregate traffic topping capable of protecting waterproof membrane base coat. This coating shall be installed in strict accordance with manufacturer's directions to a minimum thickness of 1/16 inches.

I. Verify mil thickness of all coats by use of wet-mil thickness gauge.

3.5 PROTECTION OF INSTALLED CONSTRUCTION

A. Division 01 - Execution Requirements: Protecting installed construction.

B. Do not permit traffic over unprotected surfaces.

3.6 CLEANING

A. Damaged, spotted or smeared parts of building and equipment shall be repaired and cleaned by this Contractor.

B. Work or materials damaged beyond repair in opinion of Engineer, shall be replaced by this contractor.

C. Remove all masking protection, debris, containers, equipment, materials, etc. from site and from surfaces.

END OF SECTION 071800

SECTION 079200 - JOINT SEALERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Applicable provisions of Division 1 govern work of this Section.

1.2 SUMMARY

A. Work of this Section includes providing joint sealants in the following:

1. General interior joints:

a. Perimeter joints between interior wall surfaces and frames of interior steel door frames.
b. All joints between new and existing concrete and masonry walls.

2. Interior joints in horizontal traffic surfaces as indicated below:

a. Control and expansion joints in cast-in-place concrete slabs.
b. Control and expansion joints in tile flooring.
c. Perimeter joints of toilet fixtures.

3. Exterior joints.

d. Concrete walks.
e. Windows.

1) New sealant in joints in stonework set with mortar including stone window sill and jamb junctures.
2) New sealant in joints between stone-window opening and metal window framing.

B. Provide all backing and preparation materials as required for correct and complete installation.

C. Related Work:

1. Division 08 of work
2. Divisions 20 and 26 work.

1.3 SYSTEM PERFORMANCES

A. Provide joint sealers that have been produced to establish and maintain watertight, airtight

and acoustically continuous seals as required for each application location.

1.4 SUBMITTALS

A. Product Data from manufacturers for each joint sealer product required, including instructions for joint preparation and joint sealer application. Include data for physical characteristics and compatibility with other materials and substrates.

B. Samples for Initial Selection Purposes: Manufacturer's standard bead samples consisting of strips of actual products showing full range of colors available, for each product exposed to view.

C. Samples for verification purposes of each type and color of joint sealer required. Install joint sealer samples in 1/2 inch wide joints formed between two 6 inch long strips of material matching the appearance of exposed surfaces adjacent to joint sealers.

D. Compatibility and adhesion test reports from elastomeric sealant manufacturer indicating that materials forming joint substrates and joint sealant backings have been tested for compatibility and adhesion with joint sealants. Include sealant manufacturer's interpretation of test results relative to sealant performance and recommendations for primers and substrate preparation needed to obtain adhesion.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: 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.

B. Single Source Responsibility for Joint Sealer Materials: Obtain joint sealer materials from a single manufacturer for each different product required.

C. Test Method: Test joint sealers by hand pull method described below:

1) Install joint sealants in 5-feet joint lengths using same materials and methods for joint preparation and joint sealant installation required for completed Work. Allow sealants to cure fully before testing. 2)Make knife cuts as follows: A horizontal cut from one side of joint to the other followed by 2 vertical cuts approximately 2 inches long at side of joint and meeting horizontal cut at top of 2 inch cuts. Place a mark 1 inch from top of 2 inch piece.

3) Use fingers to grasp 2 inch piece of sealant just above 1 inch mark; pull firmly down at a 90 degree angle or more while holding a ruler along side of sealant. Pull sealant out of joint to the distance recommended by sealant manufacturer for testing adhesive capability, but not less than that equaling specified maximum movement capability in extension; hold this position for 10 seconds.

a. Report whether or not sealant in joint connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each type of product and joint substrate.

b. Evaluation of Field Test Results: Sealants not evidencing adhesive failure from

testing, in absence of other indications of noncompliance with requirements, will be considered satisfactory. Do not use sealants which fail to adhere to joint substrates during testing.

1. Field-Constructed Mock-Ups: Apply elastomeric sealants to selected building joints as indicated on documents for verification of colors selected from sample submittals and to represent completed work for qualities of appearance, materials, and application. Mock-up may also be used as a test location.

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 multicomponent materials.

B. Store and handle materials in compliance with manufacturers' recommendations to prevent their deterioration or damage due to moisture, high or low temperatures, 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 manufacturer or below 40°F.
2. When joint substrates are wet due to rain, frost, condensation, or other causes.

B. Joint Width Conditions: Do not proceed with installation of joint sealers where joint widths are less than allowed by joint sealer manufacturer for application indicated.

C. Joint Substrate Conditions: Do not proceed with installation of joint sealers until contaminants capable of interfering with their adhesion are removed from joint substrates.

PART 2 - PRODUCTS

2.1 GENERAL

A. 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 sealant manufacturer based on testing and field experience.

B. Sealants shall be non-staining and non-tack type.

C. Colors: Provide color of exposed joint sealers indicated or, if not otherwise indicated, as selected by Architect from manufacturer's standard colors.

2.2 INTERIOR SEALANTS

A. Sealant Standard: Provide premium grade, high performance, moisture cured, one component, polyurethane base, non-sag sealant suitable for horizontal and vertical applications which complies with ASTM C 920 requirements, Type s, Grade NS, Class 25.

B. Subject to compliance with requirements, provide product by one of the following unless noted otherwise:

1. "Vulkem 116"; Mameco International, Inc.
2. "Sikaflex-1a"; Sika Corp.
3. "Dymonic"; Tremco Co.

2.3 EXTERIOR SEALANTS

A. Sealant Standard: Provide premium grade, high performance, moisture cured, one component, polyurethane base, non-sag sealant suitable for horizontal and vertical applications.

B. Concrete walks.

1. Small paving joints: One-Part Nonsag Urethane Sealant which complies with ASTM C 920 requirements, Type S, Grade NS, Class 25 unless noted otherwise.

a. "Chem-Caulk 900"; Bostik Construction Products Div.
b. "Chem-Caulk 2639"; Bostik Construction Products Div.
c. "Dynatrol I"; Pecora Corp.
d. "Sonolastic NP 1"; Sonneborn Building Products Div.

2. Large Paving Joints: Multi-Part Pourable Urethane Sealant which complies with ASTM C 920, Type M, Grade P, Class 25, Use T.

a. "Chem-Calk 950"; Bostik Construction Products Div.
b. "NR-200 Urexpan"; Pecora Corp.
c. "Sonolastic Paving Joint Sealant"; Sonneborn Building Products Div.

C. Windows: One component non-sag polyurethane base which complies with ASTM C 920 requirements, Type S, Grade NS, Class 25.

1. "Vulkem 116"; Mameco International, Inc.
2. "Sikaflex-1a"; Sika Corp.
3. "Dymonic"; Tremco Co.

2.3 ACCESSORIES

A. General: Provide sealant backings of material and type which are nonstaining, and compatible with joint substrates, sealants, primers and other joint fillers and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

B. Plastic Foam Joint Fillers: Preformed, compressible, resilient, nonwaxing, nonextruding strips of flexible, nongassing, closed-cell plastic foam nonabsorbent to water and gas. Manufacturer's recommended size, shape and density to control sealant depth and otherwise contribute to producing optimum sealant performance. Rod shall be at least one-third (1/3) larger diameter than width of joint.

1. Dow: "Ethafoam"
2. Williams: "Expand-O-Foam"

2. Color: Color shall match adjacent surface.

C. Bond-Breaker Tape: Polyethylene tape or other plastic tape as recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

D. Primer: Provide colorless type made or recommended by sealant manufacturer where required for adhesion of sealant to joint substrates indicated.

E. Cleaners for Nonporous Surfaces: Provide nonstaining, chemical cleaners of type which are acceptable to manufacturers of sealants and sealant backing materials, which are not harmful to substrates and adjacent nonporous materials, and which do not leave oily residues or otherwise have a detrimental effect on sealant adhesion or in-service performance.

F. Masking Tape: Provide nonstaining, nonabsorbent type compatible with joint sealants and to surfaces adjacent to joints.

G. Joint Fillers for Concrete Surfaces: Self-Expanding Cork of preformed strips complying with ASTM D 1752 for Type III.

P ART 3 - EXECUTION

3.1 EXAMINATION

A. Examine the areas and conditions under which work of this Section will be performed for compliance with requirements for joint configuration, installation tolerances or other conditions affecting joint performance. Notify Architect immediately of conditions detrimental to timely and proper completion of the work. Do not proceed with installation of sealant until unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. 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 sealants including existing sealant at wood windows and stone sills and opening jambs; dust; paint; oil grease; waterproofing and repellants; water; surface dirt.
2. Clean concrete, masonry, unglazed surfaces of ceramic tile and similar porous joint

substrate surfaces to produce a clean, sound substrate capable of developing optimum bond with joint sealers.

3. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air.
4. Remove laitance and form release agents from concrete.
5. Clean metal, glass, porcelain enamel, glazed surfaces of ceramic tile; and other nonporous surfaces by chemical cleaners or other means which are not harmful to substrates or leave residues capable of interfering with adhesion of joint sealers.

B. 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.

C. 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

A. General: Comply with joint sealer manufacturers' printed installation instructions applicable to products and applications indicated, except where more stringent requirements apply.

B. Prime all surfaces prior to application of sealants. Allow proper drying period.

C. 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. 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.

E. 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 adhesion of sealant to surfaces at back of joints would result in sealant failure.

F. Installation of Sealants:

1. 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.
2. Apply sealants with gun having proper nozzle size.
3. Depth of sealant at center of cross-section shall be uniform and of approximately 1/2 (no less than 1/3) the width of the joint up a maximum depth of 3/8 inch. Depth at bond interface shall be uniform and with a depth of no less than equal to the joint width.

G. Tooling of Sealants:

1. 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.

2. 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.

3. Provide concave joint configuration per Figure 6A in ASTM C 962, unless otherwise indicated. Use masking tape to protect adjacent surfaces of recessed tooled joints.

4. Finished joints shall be neatly pointed and finished with a beading tool. All excess materials shall be removed and surface left neat, smooth and clean.

3.4 CLEANING AND PROTECTION

A. 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.

B. 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.

C. Adjacent surfaces shall be clean and free of stains.

END OF SECTION 079200

SECTION 079213 – JOINT SEALERS – SEATING STRUCTURE

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes all labor, material, equipment and related services necessary to remove existing sealants, clean, and install new sealants for the entire seating structure:

1. Sealant materials.

2. Joint backing.

3. Flexible expansion joint material

4. Accessories.

B. Related Sections:

1. Applicable provisions of Division 01 shall govern all work under this Section.

2. Section 030130 – Concrete Rehabilitation.

3. Section 071800 – Traffic Coatings.

1.2 UNIT PRICE – MEASUREMENT AND PAYMENT

A. Joint Sealant: Lump sum included in base bid.

B. Expansion Joint Flexible Material: Lump sum included with base bid.

1.3 REFERENCES

A. American Society for Testing and Materials (ASTM International):

1. ASTM C834 - Standard Specification for Latex Sealants.

2. ASTM C920 - Standard Specification for Elastomeric Joint Sealants.

3. ASTM C1193 - Standard Guide for Use of Joint Sealants.

4. ASTM D1056 - Standard Specification for Flexible Cellular Materials-Sponge or Expanded Rubber.

5. ASTM D1667 - Standard Specification for Flexible Cellular Materials-Vinyl Chloride Polymers and Copolymers (Closed-Cell Foam).

6. ASTM D2628 - Standard Specification for Preformed Polychloroprene Elastomeric Joint Seals for Concrete Pavements.

1.4 SUBMITTALS

A. Division 01 - Submittal Procedures: Submittal procedures.

B. Products Data: Submit data indicating sealant chemical characteristics, performance criteria, substrate preparation, limitations, and color availability.

C. Expansion Joint Flexible Material: Submit data of physical characteristics, dimensions, and manufacturer installation requirements.

D. Manufacturer's Installation Instructions: Submit special procedures, surface preparation, and perimeter conditions requiring special attention.

E. Warranty: Include coverage for installed sealants and accessories failing to achieve watertight seal, exhibit loss of adhesion or cohesion, and sealants which do not cure.

1.5 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum five years documented experience.

B. Applicator: Company specializing in performing Work of this section with minimum five years documented experience and approved by manufacturer.

C. Installer of joint sealant shall be the same as waterproof membrane. See Section 071800.

D. Installer of joint sealant shall also remove existing sealants and clean joints.

1.6 ENVIRONMENTAL REQUIREMENTS

A. Division 01 - Products Requirements.

B. Maintain temperature and humidity recommended by sealant manufacturer during and after installation.

1.7 COORDINATION

A. Division 01 - Administrative Requirements: Coordination and project conditions.

B. Coordinate Work with sections referencing this section.

PART 2 - PRODUCTS

2.1 JOINT SEALERS

A. Manufacturers:

1. Tremco Incorporated Dymeric 240FL.

2. Sonneborn Sonolastic NP1/NP2.

3. Sika Corp., Sikaflex-2C NS.

4. Substitutions: In accordance with Division 01 - Products Requirements.

B. EXPANSION JOINT

1. Sikadur - Combiflex.

2. Substitutions: In accordance with Division 01 - Product Requirements.

2.2 ACCESSORIES

A. Primer: Non-staining type, recommended by sealant manufacturer to suit application.

B. Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.

C. Joint Backing: Round foam rod compatible with sealant; ASTM D1056, sponge or expanded rubber; oversized 30 to 50 percent larger than joint width.

D. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.

E. Installer of joint sealant responsible for insuring supplied waterproof membrane system is compatible with supplied joint sealant.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Division 01 - Administrative Requirements: Coordination and project conditions.

B. Verify substrate surfaces and joint openings are ready to receive work.

C. Verify joint backing and release tapes are compatible with sealant.

3.2 PREPARATION

A. Remove loose materials and foreign matter impairing adhesion of sealant.

B. Clean and prime joints.

C. Perform preparation in accordance with ASTM C1193.

D. Protect elements surrounding Work of this section from damage or disfiguration.

3.3 INSTALLATION

A. Measure joint dimensions and size joint backers to achieve width-to-depth ratio, neck dimension, and surface bond area as recommended by manufacturer

B. Install bond breaker where joint backing is not used.

C. Install sealant free of air pockets, foreign embedded matter, ridges, and sags.

D. Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.

E. Tool joints smooth with adjacent surfaces.

F. Pre-compressed Foam Sealant: Do not stretch; avoid joints except at corners, ends, and intersections; install with face 1/8 to 1/4 inch below adjoining surface.

G. Compression Gaskets: Avoid joints except at ends, corners, and intersections; seal joints with adhesive; install with face 1/8 to 1/4 inch below adjoining surface.

3.4 CLEANING

A. Division 01 - Execution Requirements: Final cleaning.

B. Clean adjacent soiled surfaces.

3.5 PROTECTION OF INSTALLED CONSTRUCTION

A. Division 01 - Execution Requirements: Protecting installed construction.

B. Protect sealants until cured.

3.6 PROTECTION OF INSTALLED CONSTRUCTION

A. Project Manual 2: Structural Repair Schedules.

END OF SECTION 079213

SECTION 081113 - HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Commercial quality steel doors and frames.

B. Related Sections:

1. Division 04 Section "Unit Masonry" for embedding anchors for hollow metal work into masonry construction.
2. Division 08 Section "Door Hardware" for door hardware for hollow metal doors.
3. Division 09 Sections "Exterior Painting" and "Interior Painting" for field painting hollow metal doors and frames.

1.3 DEFINITIONS

A. Minimum Thickness: Minimum thickness of base metal without coatings.

B. Standard Hollow Metal Work: Hollow metal work fabricated according to ANSI/SDI A250.8.

C. Custom Hollow Metal Work: Hollow metal work fabricated according to ANSI/NAAMM-HMMA 861.

1.4 SUBMITTALS

A. Product Data: For each type of door and frame specified, including details of construction, materials, dimensions, hardware preparation, core, label compliance, sound ratings, profiles, and finishes.

B. Shop Drawings: Show fabrication and installation of standard steel doors and frames. Include details of each frame type, elevations of door design types, conditions at openings, details of construction, location and installation requirements of door and frame hardware and reinforcements, and details of joints and connections. Show anchorage and accessory items.

1. Schedule: Provide a schedule of doors and frames using same reference numbers for details and openings as those on bid documents.

C. Label Construction Certification: For door assemblies required to be fire rated and exceeding limitations of labeled assemblies, submit manufacturer's certification that each door and frame assembly has been constructed to conform to design, materials and construction equivalent to requirements for labeled construction.

1.5 QUALITY ASSURANCE

A. Provide doors and frames complying with on of the following:

1. Steel Door Institute (SDI) "Recommended Specifications Standard Steel Doors and Frames" ANSI/SDI-100 and as herein specified.
2. Hollow Metal Manufacturers Association (HMMA) "Hollow Metals".

B. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80, are identical to door and frame assemblies whose fire resistance characteristics have been determined per ASTM E 152 and which are labeled and listed by UL.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver hollow metal work palletized, wrapped, or crated to provide protection during transit and Project-site storage.

B. Inspect doors and frames upon delivery for damage. Minor damages may be repaired provided refinished items are equal in all respects to new work and acceptable to Architect; otherwise, remove and replace damaged items as directed.

C. Store hollow metal work under cover at Project site. Place units on minimum 4-inches high wood blocking. Avoid use of non-vented plastic or canvas shelters which could create humidity chamber. If cardboard wrapper on door becomes wet, remove carton immediately.

1. Provide minimum 1/4-inch (6-mm) space between each stacked door to permit air circulation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide standard steel doors and frames by one of the following:

1. Amweld Building Products, LLC.
2. Ceco Door Products; an Assa Abloy Group company.
3. Curries Company; an Assa Abloy Group company.
4. Kewanee Corporation (The).
5. Pioneer Industries, Inc.
6. Republic Builders Products.
7. Steelcraft; an Ingersoll-Rand company.

2.2 MATERIALS

A. Cold-Rolled Steel Sheet: ASTM A 366, Commercial Quality Carbon Steel (CS).

B. Supports and Anchors: Fabricate of not less than 16-gage sheet steel, galvanized after fabrication in compliance with ASTM A 153, Class B,

C. Inserts, Bolts, and Fasteners: Manufacturer's standard units. Where items are to be built into exterior wall, hot-dip galvanized according to ASTM A 153, Class C or D as applicable.

D. Shop Applied Primer: Rust-inhibitive enamel or paint, applied by either air-drying or baking, suitable as a base for specified finish paints complying with ANSI A224.1, "Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames."

2.3 STANDARD HOLLOW METAL DOORS

A. General: Fabricate steel doors to be rigid, neat in appearance and free from defects, warp or buckle. Fit and assemble units in factory. Comply with ANSI/SDI-100 requirements.

B. Provide flush steel doors 1-3/4 inches thick, seamless hollow construction. Bevel vertical edges 1/8 inches in 2 inches.
   1. Fabricate of two stretcher-leveled sheets, minimum 18 gage.
   2. Construct doors with smooth, flush surfaces, without visible joints or seams on exposed faces or stile edges in accordance with ANSI/SDI 100 Grade II, heavy-duty, Model 3 or 4.
   3. Internal Construction: Manufacturer's standard honeycomb, polyurethane, polystyrene, unitized steel grid, vertical steel stiffeners, or rigid mineral fiber core with internal sound deadener on inside of face sheets where appropriate in accordance with SDI standards.
   4. Reinforce tops and bottoms of doors with 18 gage horizontal steel channels, welded continuously to outer sheets.
   5. Clearances: Not more than 1/16 inch at jambs and heads except between non-fire-rated pairs of doors not more than 1/4 inch. Not more than 1/2 inch at bottom.

C. Tolerances: Comply with SDI 117, "Manufacturing Tolerances for Standard Steel Doors and Frames."

2.4 STANDARD HOLLOW METAL FRAMES

A. Provide metal frames for doors as shown on drawings and schedules.

B. Knock-down frames are acceptable only in existing masonry wall openings.

C. Fabricate steel frame units to be rigid, neat in appearance and free from defects, warp or buckle and with all fastenings concealed. Fit and assemble units in factory. Comply with ANSI/SDI-100 requirements.

D. Fabricate frames of minimum 16-gage cold-rolled steel for openings up to 4"-0" wide and 14-gage for openings over 4'-0" wide.

E. Fabricate frames of full-welded unit construction, mitered corners, reinforced and continuously welded for full depth and width of frame.

F. Head Reinforcing:
   1. Leave vertical mullions open at top for grouting.
   2. For frames over 4'-0" wide, provide continuous steel channel or angle stiffener, 12 gage minimum, for full width of opening and welded to back of frame at head.

G. Jamb Anchors: Minimum 18 galvanized sheet steel, adjustable, flat, corrugated or perforated, T-shaped to suit frame size. Leg shall be 2 inches wide min. by 10 inches long. Minimum of three per jamb, to be equally spaced.

H. Spreader Bars: Provide removable spreader bars across bottom of all frames, tack welded to jambs and mullions.

2.5 HARDWARE PREPARATION

A. Prepare doors and frames to receive concealed hardware in accordance with final Door Hardware Schedule and templates provided by hardware supplier. Comply with applicable requirements of ANSI A115 Series Specifications for door and frame preparation for hardware.

B. Reinforce doors and frames to receive surface-applied hardware. Drilling and tapping for surface-applied hardware may be done at project site.

C. Locate hardware as indicated on final shop drawings or, if not indicated, in accordance with "Recommended Locations for Builder's Hardware on Standard Steel Doors and Frames," published by Door and Hardware Institute.

D. Steel plate reinforcement for finish hardware shall comply with the following minimum requirements:
   1. Hinges: 7 gage thick by 1-1/2 inches wide by 6 inches longer than hinge. Secure with no less than six spot welds.
   2. Strikes, Flush Bolts, and Closers: 12 gage.
   3. Surface-Mounted Hold Open Arms and Panic Devices: 12 gage.
   4. All other surface mounted hardware: 16 gage.

2.6 STEEL FINISHES

A. Shop Priming: Clean, treat, and prime paint exposed surfaces of steel door and frame units, including galvanized surfaces.
   1. Clean steel surfaces of mill scale, rust, oil, grease, dirt, and other foreign materials before application of paint.
   2. Apply pretreatment to cleaned metal surfaces using cold phosphate solution (SSPC-PT2), hot phosphate solution (SSPC-PT4) or basic zinc chromate-vinyl butryl solution (SSPC-PT3).
   3. Apply shop coat of prime paint of even consistency to provide a uniformly finished surface ready to receive finish paint of no less than 7 mils dry film thickness.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General: Install standard steel doors, frames, and accessories in accordance with final shop drawings, manufacturer's data, and in accordance with SDI or HMMA requirements.

B. Placing Frames: Comply with provisions of SDI-105 "Recommended Erection Instructions For Steel Frames," or NFPA 80 at fire-rated openings unless otherwise indicated.
   1. Except for frames located at existing concrete or masonry installations, place frames prior to construction of enclosing walls and ceilings. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is completed, remove temporary braces and spreaders leaving surfaces smooth and undamaged.
   2. In masonry construction, locate 3 wall anchors per jamb adjacent to hinge location on hinge jamb and at corresponding heights on strike jamb.
   3. At existing concrete or masonry construction, provide 3 completed opening anchors per jamb adjacent to hinge location on hinge jamb and at corresponding heights on strike jamb, set frames and secure to adjacent construction with bolts and masonry anchorage devices.

C. Door Installation: Fit hollow metal doors accurately in frames, with the following clearances:
   1. Jambs and Head: 3/32 inch.
   2. Meeting edges, pairs of doors: 1/8 inch.
   3. Bottom: 3/8 inch with no threshold, 1/8 inch with threshold.
   4. Install fire-rated doors with clearances as specified in NFPA Standard No. 80.

3.2 ADJUSTING AND CLEANING

A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition.

B. Prime-Coat Touchup: Immediately after erection, sand smooth any rusted or damaged areas of prime coat and apply touchup of compatible air-drying primer.

END OF SECTION 081113

SECTION 083323 -OVERHEAD COILING DOORS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Section includes overhead coiling security shutters and grill, locks and cylinders for Concessions Counter Window and at new Vomitory ramp.

1.2 SUBMITTALS

A. Product Data: Submit manufacturer's complete product data for all specified components, including specifications, finish information and installation instructions.

B. Shop Drawings: Submit shop drawings showing layout, sizes and types, product materials, components and accessories, fabrication data, operation and wiring diagrams for motor driven operators, finishes, rough-in dimension, anchorage and installation requirements and details.

C. Samples: Manufacturer's standard array of colors for selection by architect.

D. Quality Assurance Submittals:
   1. Certificates: Manufacturer's certification that design criteria meets specified requirements.
   2. Operating and Maintenance Instructions: Submit detailed maintenance requirements and operating instructions.
   3. Warranty: Submit standard warranty documents.

1.3 QUALITY ASSURANCE

A. Installer Qualifications: Use only manufacturer's factory trained installers or qualified licensed installers approved by shutter manufacturer.

B. Regulatory Requirements:
   1. Comply with all local and governing code requirements.
   2. Unless required otherwise, fabricate to withstand wind loads that have the same rating as component and cladding of walls.

C. Pre-Installation Conference: Conduct a pre-installation meeting to verify project installation and coordination requirements, field conditions and manufacturer instructions.

1.4 PROJECT CONDITIONS

1.5 WARRANTY

A. Manufacturer's Warranty: Submit, for owner's acceptance, manufacturer's standard warrant document executed by an authorized company official.
   1. Warranty Period: 1 year.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Overhead Coiling Doors:
   1. Overhead Door Corp., Pennsylvania Division; tel. (800) 929-2553

   2. QMI Roll Shutter Supply , 933 North Oaklawn Avenue, Elmhurst, IL 60126, Tel: (800) 446-2500 Fax: (630)782-1911

   2. Approved Equal.

2.2 MATERIALS

A. Shutter Components for Concessions Window:
   1. Slat Types: PVC Slats: Exterior type UV stabilized Extruded polyvinyl chloride: Style: PV-2 with slat reinforcement every 3 slats. Color: Beige.
   2. Bottom Bar: Extruded aluminum, 6063-T5 alloy, 0.050 inch wall thickness.
   3. Operation: Manual
      a. Manual operator type: 3/1 crank-strap recoiler.
      b. End-Caps: Die-cast aluminum. Style: 4 sided. Color: To match slats.
   4. Box Housing: .040 roll formed aluminum. Style 4 sided. Color: To match slats.
   5. Side Tracks: Aluminum extrusion, 6063-T5, lined with insulating woven polypropylene runners. Color: To match slats.
   6. Mounting: Surface.

B. Security Grilles for coiling grill at new Vomitory ramp:
   1. Material: Aluminum.
   2. Finish: Components shall have all non-galvanized, exposed ferrous surfaces shall receive one coat of rust-inhibitive primer.

C Guides: extruded aluminum shapes with retainer grooves with continuous silicone treated wool-pile strips or PVC inserts to reduce noise and assist operation.

D. Brackets: minimum 3/16" steel to support barrel and counterbalance.

E. Counterbalance: helical torsion spring type. Counterbalance shall be housed in a steel tube or pipe barrel, supporting the curtain with deflection limited to 0.03" per foot of span. Counterbalance shall be adjustable by means of an adjusting tension wheel.

F. Hood: galvanized steel, 24 gauge (primed steel, 24 gauge) hood with intermediate supports as required.

G. Manual Operation: chain hoist.

H. Locking: chain keeper locks for chain hoist operation.

I. Framing: free standing tubular steel support frames supplied with grilles.