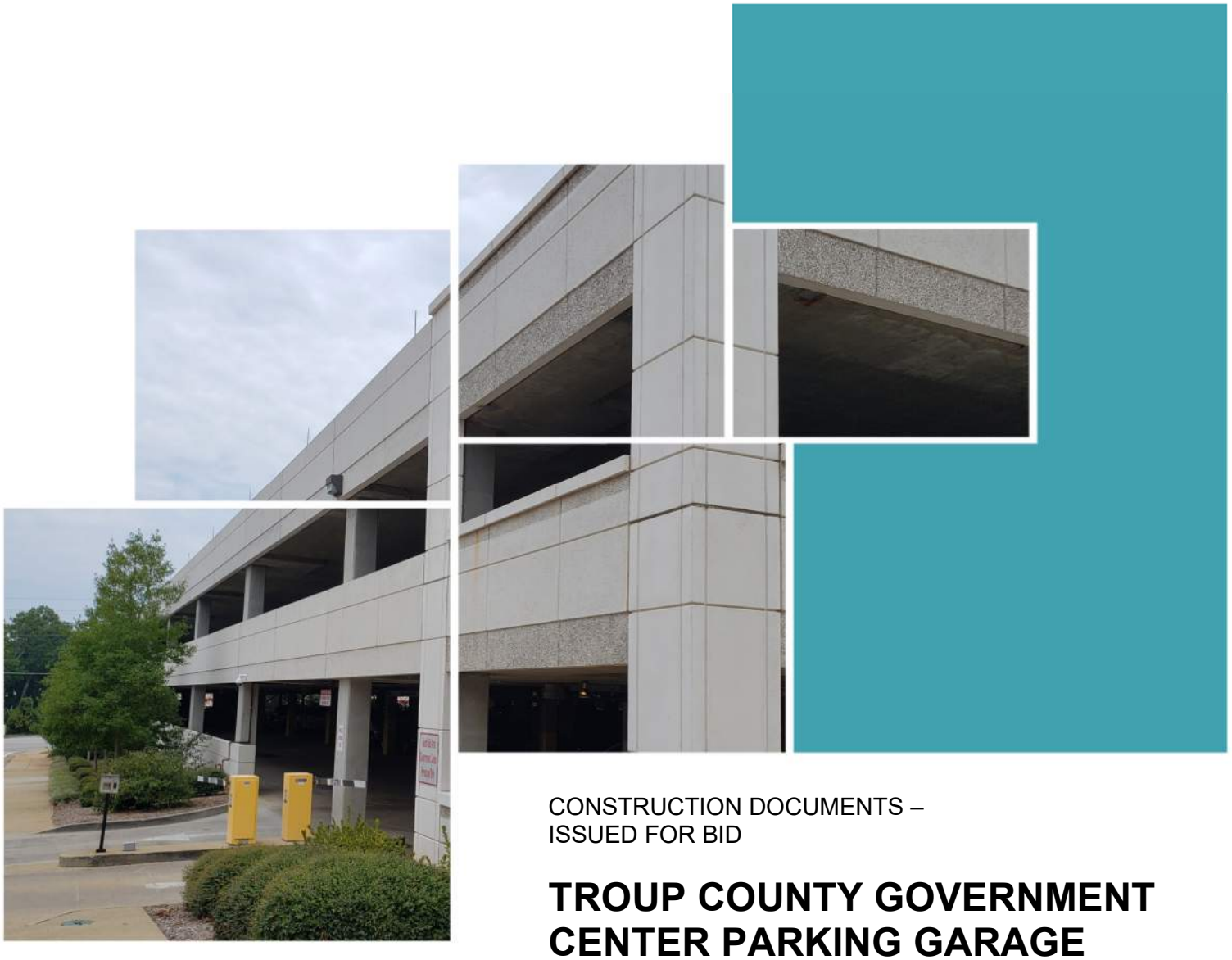
4904 Eisenhower Blvd, Suite 150
Tampa, FL 33634

813-888-5800
walkerconsultants.com



CONSTRUCTION DOCUMENTS –
ISSUED FOR BID

# TROUP COUNTY GOVERNMENT CENTER PARKING GARAGE REPAIRS

LaGrange, Georgia

June 30, 2021

*Walker Project No. 15-002420.20*

2WR + PARTNERS

WALKER CONSULTANTS

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**END OF SECTION 000115**

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# SECTION 001116 - INVITATION TO BID AND INSTRUCTIONS TO BIDDER

## 10.1 PROJECT IDENTIFICATION AND DEFINITIONS

A. Owner will receive sealed Bids for:

Troup County Government Center East Parking Garage Restoration Documents dated 06.30.2021 plus all addendums.

B. Owner is:

Troup County Board of Commissioners
100 Ridley Avenue
LaGrange, Georgia.

C. Engineer is: WALKER Consultants

4904 Eisenhower Boulevard, Suite 150
Tampa, FL 33634

Architect is: 2WR Partners

11 Ninth Street, Suite 120
Columbus, GA 31901

Electrical Engineer is: Engineered Systems & Services

2950 Horizon Park Dr., Suite B
Suwanee, GA 30024

D. Project consists of:

1. Project consists of providing all materials, labor, equipment, supervision, and services required to perform repairs and provide new lighting in both the east parking garage and in the Judges Parking Area at the Troup County Government Center in accordance with the Contract Documents.

E. Bids will be received for single contract including:

1. All work described in the Contract Documents.

F. Bids shall be prepared on the enclosed forms and submitted to the Engineer as follows.

1. Bids not conforming to Instructions to Bidders will be disqualified and considered nonresponsive.
2. Bids shall be for the performance of all work indicated by the Contract Documents for the project. **NO EXCLUSIONS will be accepted.**

G. Bids are due at the time and address as advertised in the REQUEST FOR SEALED BIDS by Troup County Government Purchasing Department. Parking Garage Repairs

Attention: Diana Evans – Purchasing Director
**EMAILED BIDS WILL NOT BE ACCEPTED.**

The Troup County Commissioners reserve the right to reject any or all bids, to accept a bid other than the lowest bid, to waive, at its sole discretion, any irregularity in any bid.

## 10.2 DOCUMENTS

A. Contract between Owner and Contractor: Contract Documents listed in Agreement. Also see Section "Agreement Form."

B. Complete sets of Bidding Documents shall be used in preparing Bids. Neither Owner nor Engineer assume any responsibility for errors or misinterpretations resulting from use of incomplete sets of Bidding Documents.

C. Owner and Engineer in making copies of Bidding Documents available on above terms do so only for purpose of obtaining Bids on Work and do not confer license or grant for any other use.

## 10.3 QUALIFICATIONS OF BIDDERS

A. Owner may make such investigation as it deems necessary to determine ability of Bidder to perform Work, and Bidder shall furnish to Owner all such information and data for this purpose as Owner may request. Owner reserves right to reject any Bid if evidence submitted by, or investigation of, such Bidder fails to satisfy Owner that such Bidder is properly qualified to carry out obligations of Contract and to complete Work contemplated therein. Conditional Bids and voluntary alternates will not be accepted.

B. Bidding firms will not be considered qualified if:

1. Firm, or principals thereof, have defaulted on any contract, bid or bond within preceding 36 months.
2. Firm has had no previous experience in performance of Work being bid.
3. Firm, as name entitled, has not been in operation in this type of Work for period of 24 months prior to this bid date.
4. Firm has not been awarded any prior contracts of similar amount and kind.
5. Firm, or principals thereof, have failed in faithful performance during warranty or guarantee period on previous Work.
6. Firm is found to have misstated or omitted any material fact in this prequalification statement.

C. Each Bidder may be called upon to provide Owner with following information:

1. Comprehensive financial statement showing current balance of unencumbered net worth equal to at least 10% of value of anticipated bid price.
2. Comprehensive list of personnel and equipment available for performance of Work to be bid.
3. Complete list of all contract work performed, or under construction if contract(s) awarded within previous 5 yr period prior to bidding.
4. See Structural Restoration Contractor's Qualification Statement section for additional requested information and submittal forms.

## 10.4 EXAMINATION OF CONTRACT DOCUMENTS AND SITE

A. Bidders shall carefully examine contract documents and site to obtain first-hand knowledge of existing conditions. No subsequent extras will be allowed due to any claim of lack of knowledge for conditions which can be determined by examining site and contract documents.

B. Extent of repairs is approximately represented on Drawings. Actual locations and extent of repair may deviate from that represented on Drawings based on field conditions.

C. Submission of Bid shall constitute warranty that:

1. Bidder and all Subcontractors it intends to use have carefully and thoroughly reviewed Contract Documents and have found them complete and free from ambiguities and sufficient for purposes intended; further that,
2. Bidder and all workers, employees and Subcontractors it intends to use are skilled and experienced in type of construction represented by Contract Documents bid upon; further that,
3. Neither Bidder nor any of its employees, agents, suppliers or Subcontractors have relied on any verbal representations from Owner, Engineer/Architect, or any of their employees, agents, or consultant, in assembling Bid figure; and further that,
4. Bid figure is based solely on Contract Documents, including properly issued written addenda, and not upon any other written representation.

D. Bidder shall identify, prior to bid, all errors and/or discrepancies in Contract Documents that would be apparent to reasonably diligent Bidder. In no case shall Bidder, if selected as Contractor, be permitted any extra amount of time or money to complete project, or expenses incurred as result of such errors or discrepancies.

## 10.5 RESOLUTION OF DISCREPANCIES AND AMBIGUITIES

A. All questions about meaning or intent of Contract Documents shall be submitted to Engineer in writing through the Purchasing Director at devans@troupco.org.

Replies will be issued by Addenda delivered to all parties recorded by Engineer as having received Contract Documents for Bidding. Questions received less than 5 days prior to date for opening of Bids will not be answered. Only answers contained in formal written Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect. The last day for bidder questions regarding the project and the final day for issuing addendum will be determined at the Mandatory Pre-Bid Conference defined in section 10.14 of this specification.

B. Any Addendum issued during pre-bid period shall be included in Bid, shall become part of Contract Documents, and shall be acknowledged on Bid Form.

## 10.6 SUBSTITUTED MATERIAL AND EQUIPMENT

A. Contract, if awarded, will be on basis of material and equipment described in Drawings or specified in Specifications without consideration of possible substitute or "or-equal" items. Whenever it is indicated in Drawings or specified in the Specifications that substitute or "or-equal" item of material or equipment may be furnished or used by Contractor if acceptable to Engineer/Architect, application for such acceptance will not be considered by Engineer/Architect until after "effective date of Agreement."

B. In advance of notice of Award, apparent successful Bidder, and any other Bidder so requested, will within seven days after day of Bid Opening submit to Owner list of substitutions proposed for products or materials specified for Project. After Award of Contract, procedure for submittal of any such application by Contractor and consideration by Engineer/Architect is set forth in Division 1 Sections, “Product Requirements" and "Product Substitution Procedures."

## 10.7 BASIS FOR BIDS

A. Bids are based on lump sum contract at unit prices. Work Item quantities are based on Engineer/Architect's estimates.

## 10.8 PREPARATION OF BIDS

A. Bid Form is bound herewith. Bid Forms must be completed in ink or by typewriter.

B. Bids must be made in form given in this Project Manual. No oral, telephonic or telegraphic Bids will be considered. Bids shall be signed by Bidder giving full name and business address. State whether Bidder is individual, partnership or corporation.

C. Each Bidder shall fill in all blanks on Bid Forms and quote on all alternates required. State all quotations in words and figures. In case of discrepancy between amount stated

in words and amount stated in figures, amount stated in words shall govern. Entire Bid shall be without interlineation, alteration or erasure.

D. Bids by corporations shall be executed in corporate name by president, vice-president or other corporate officer (accompanied by evidence of authority to sign) and corporate seal shall be affixed and attested by secretary or assistant secretary. Corporate address and state of incorporation shall be shown below signature.

E. Bids by partnerships shall be executed in partnership name and signed by partner. Partner's title must appear under partner's signature and official address of partnership must be shown below signature.

F. Bids not signed by individuals making them shall have attached thereto power of attorney evidencing authority to sign Bid in name of person for whom it is signed.

G. All names must be typed or printed legibly below signature.

## 10.9 SUBCONTRACTOR LISTING

A. If Supplementary Conditions require identity of certain Subcontractors and other persons and organizations to be submitted to Owner in advance of Notice of Award, apparent successful Bidder, and any other Bidder so requested, shall within seven days after day of Bid opening submit to Owner list of all Subcontractors and other persons and organizations (including those who are to furnish principal items of material and equipment) proposed for those portions of Work as to which such identification is so required. Such list shall be accompanied by experience statement with pertinent information as to similar projects and other evidence of qualification for each such Subcontractor, person and organization if requested by Owner.

B. If Owner or Engineer after due investigation has reasonable objection to any proposed Subcontractor, other person or organization, either may request apparent Successful Bidder to submit acceptable substitute before giving Notice of Award. If apparent successful Bidder declines to make any such substitution, contract shall not be awarded to such Bidder. Any Subcontractor, other person or organization so listed and to whom Owner or Engineer does not make written objection prior to the giving of Notice of Award will be deemed acceptable to Owner and Engineer.

C. In contracts where Contract Price is on basis of Cost-of-the-Work Plus a Fee, apparent Successful Bidder, prior to Notice of Award, shall identify in writing to Owner those portions of Work that such Bidder proposes to subcontract and after Notice of Award may only subcontract other portions of Work with Owner's written consent.

D. No Contractor shall be required to employ any Subcontractor, other person or organization against whom it has reasonable objection.

## 10.10 IDENTIFICATION AND SUBMISSION OF BIDS

A. Bids shall be submitted at the time and place indicated in Invitation to Bid and shall be placed in opaque sealed envelope, marked with Project title, and name and address of Bidder, and accompanied by other required documents.

## 10.11 MODIFICATION OR WITHDRAWAL OF BIDS

A. Bids may be withdrawn by written or telegraphic request dispatched by Bidder in time for delivery, in normal course of business, prior to time fixed for opening of Bids, provided that written confirmation of any telegraphic withdrawal, over signature of Bidder, is placed in mail and postmarked prior to time set for opening Bids.

## 10.12 GOVERNING LAWS AND REGULATIONS

A. No Contractor shall discriminate against any employee or applicant for employment, to be employed in performance of contract, with respect to their hire, tenure, terms, conditions or privileges of employment, because of their race, color, religion, gender, national origin or age pursuant to requirements of all applicable federal and state statutes.

B. Each Bidder shall make affidavit that its Bid is genuine and not sham or collusive or made in interests or on behalf of any person not therein named and that Bidder has not directly or indirectly induced or solicited any Bidder to put in sham Bid or any other person or corporation to refrain from Bidding, and that Bidder has not in any manner sought by collusion to secure itself an advantage over other Bidders.

## 10.13 CONTRACT TIME

A. Time is of essence in performance of Work under this Contract. Available time for Work under this Contract is indicated in Bid Form and will be include in executed Agreement. If these time requirements cannot be met, Bidder is requested to stipulate in Bid schedule for performance of Work. Consideration will be given to time in evaluating Bids.

## 10.14 PRE-BID CONFERENCE

A. A **mandatory** pre-bid conference will be held at the date, time and location stated in the REQUEST FOR SEALED BIDS by Troup County Government Purchasing Department. Parking Garage Repairs. **All Bidders are required to attend.**

## 10.15 DISQUALIFICATION OF BIDDERS

A. Prior to opening of Bids Owner reserves right to conduct investigations into qualifications and experience of any or all persons or organizations wishing to submit Bid for Project.

B. Based upon findings of such investigations, Owner reserves right to deny any or all persons or organizations opportunity to submit Bid for Project.

C. In evaluating Bids after Bids are opened and prior to Award of Contract, Owner shall consider qualifications of Bidders, whether or not Bids comply with prescribed requirements, and alternates and unit prices if requested in Bid Forms.

D. Owner may consider qualifications and experience of Subcontractors and other persons and organizations (including those who are to furnish principal items of material or equipment) proposed for those portions of Work as to which identity of Subcontractors and other persons and organizations must be submitted as provided in Section "Supplementary Conditions." Operating costs, and maintenance considerations, performance data and guarantees of materials and equipment may also be considered by Owner.

E. Owner may conduct such investigations as it deems necessary to assist in evaluation of any Bid and to establish responsibility, qualifications and financial ability of Bidders, proposed Subcontractors and other persons and organizations to do Work in accordance with Contract Documents to Owner's satisfaction within prescribed time.

F. Owner reserves right to reject Bid of any Bidder who does not pass any such evaluation to Owner's satisfaction.

G. Owner reserves right to disqualify Bids before or after opening, upon evidence of collusion with intent to defraud or other illegal practices upon part of Bidder.

## 10.16 BIDS TO REMAIN OPEN

A. All Bids shall remain open for 60 days after Bid opening, but Owner will release all except 3 lowest Bids within 7 days after Bid opening.

## 10.17 AWARD OF CONTRACT

A. Owner reserves right to reject any and all Bids, to waive any and all informalities and to negotiate contract terms with Successful Bidder, and right to disregard all nonconforming, nonresponsive or conditional Bids and to make award in any manner deemed in best interest of Owner. Discrepancies between words and figures will be resolved in favor of words. Discrepancies between indicated sum of any column of figures and correct sum thereof will be resolved in favor of correct sum.

B. In evaluating Bids, Owner shall consider qualifications of Bidders, whether or not Bids comply with prescribed requirements, and alternates and unit prices if requested in Bid Forms.

C. It is Owner's intent to accept alternates (if any are accepted) in order in which they are listed in Bid Form but Owner may accept them in any order or combination.

D. If contract is to be awarded it will be awarded to lowest Bidder whose evaluation by Owner indicates to Owner that award will be in best interests of Project.

E. If contract is to be awarded, Owner will give Successful Bidder Notice of Award within 30 days after day of Bid opening.

## 10.18 EXECUTION OF CONTRACT

A. When Owner gives Notice of Award to Successful Bidder, it will be accompanied by at least 3 unsigned counterparts of Agreement and all other Contract Documents. Within 15 days thereafter Contractor shall sign and deliver at least 3 counterparts of Agreement to Owner with all other Contract Documents attached. Within 10 days thereafter Owner will deliver all fully signed counterparts to Contractor. Engineer will identify those portions of Contract Documents not fully signed by Owner and Contractor and such identification shall be binding on all parties.

## 10.19 CONTRACT PRICE

A. Proposals are solicited on basis of unit prices and/or lump sum prices which are to be clearly set forth in Bid Form. Final Contract price on accepted Proposal will be determined by multiplying number, or fraction thereof, units of Work actually performed, or labor, material or appliances actually supplied, by price designated for such item in Proposal. Total Bid figure on Proposal Form is merely for purposes of estimating and comparing costs and under no circumstances on unit price contracts does it constitute or imply total Contract price.

**END OF SECTION 001116**

# SECTION 004100 - BID FORMS

## 30.1 INSTRUCTIONS

Submit Bids on this Bid Form in accordance with Instructions to Bidders.

## 30.2 BID FORM

### PART 1 - TERMS OF BID

PROJECT IDENTIFICATION:

Troup County Government Center Parking East Garage Restoration.

THIS BID IS SUBMITTED TO:

Troup County Government
100 Ridley Avenue, Suite 3100
LaGrange, Georgia, 30240
Attention: Diana Evans – Purchasing Director

A. The undersigned BIDDER proposes and agrees, if this Bid is accepted, to enter into an Agreement with OWNER in form included in Contract Documents to complete all Work as specified or indicated in Contract Documents for Contract Price and within Contract Time indicated in this Bid and in accordance with Contract Documents.

B. BIDDER accepts all of terms and conditions of Instructions to Bidders. BIDDER will sign Agreement and submit Contract Security and other documents required by Contract Documents within 15 days after date of OWNER's Notice of Award. This Bid will remain open for 60 days after day of Bid opening.

C. In submitting this Bid, BIDDER represents, as more fully set forth in Agreement, that:

1. BIDDER has examined copies of all Contract Documents and of following addenda:

| Date | Number |
|---|---|
| _____ | _____ |
| _____ | _____ |

(receipt of all of which is hereby acknowledged) and also copies of Advertisement or Invitation to Bid or Instructions to Bidders.

2. BIDDER has examined site and locality where Work is to be performed, legal requirements (federal, state and local laws, ordinances, rules and regulations) and conditions affecting cost, progress or performance of Work and has made such independent investigations as BIDDER deems necessary.
3. This Bid is genuine and not made in interest of or on behalf of any undisclosed person, firm or corporation and is not submitted in conformity with any agreement or rules of any group, association, organization or corporation; BIDDER has not directly induced or solicited any other Bidder to submit false or sham Bid; BIDDER has not solicited or induced any person, firm or corporation to refrain from bidding; and BIDDER has not sought by collusion to obtain for itself any advantage over any other Bidder or over OWNER; and
4. BIDDER agrees that Work Item quantities are estimates and that OWNER may increase or decrease these quantities at unit prices stated, so long as increases or decreases in Base Bid do not exceed 25% of Base Bid price. Increases or decreases beyond these limits shall be in accordance with Supplementary Conditions, Section 007300.
5. BIDDER agrees that all alterations or additions to Work shall be performed in accordance with paragraph “Changes” and/or “Construction Change Directives” under Section "Supplementary Conditions."
6. OWNER reserves right to delete any section of Work.

D. BIDDER agrees that Work shall be substantially completed and fully completed on or before dates or within number of calendar days indicated in Agreement.

shall be substantially completed on or before:
Four Months after Notice to Proceed

and fully completed by:
Five Months after Notice to Proceed

E. BIDDER will complete Work for following price(s) based on unit prices stated in Section 004310:

LUMP SUM CONTRACT PRICE _____
(use words)

_____DOLLARS $_____
(figures)

F. Communications concerning this Bid shall be addressed to: (BIDDER to provide bidder’s name, address, telephone number and name of individual familiar with this Bid and able and authorized to answer questions regarding this Bid.)

_____

_____

_____

G. Terms used in this Bid which are defined in General Conditions of Construction Contract included as part of Contract Documents have meanings assigned to them in General Conditions.

SUBMITTED ON _____ , 20 _____

**PART 2 - MATERIAL AND EQUIPMENT ALTERNATES**

Base Bid proposal price shall include materials and equipment selected from designated items and manufacturers listed. The purpose of this requirement is to establish uniformity in bidding and to establish standards of quality for items named.

If BIDDER wishes to quote alternate items for consideration by Owner, it may do so under this Section. Complete description of item and proposed price differential must be provided. Unless approved at time of award, substitutions where items are specifically named will be considered only as negotiated change in Contract Sum.

| WORK ITEM | DESCRIPTION OF ALTERNATE ITEM(S) | ADD/DEDUCT AMOUNT |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

**PART 3 - TIME ALTERNATE**

If BIDDER takes exception to time stipulated in Part 1, Terms of Bid, it shall stipulate below its proposed time for performance of Work. Consideration will be given to time in evaluating Bids.

BIDDER agrees that Work shall be substantially completed within ____ calendar days after date when Contract Time commences to run, and fully completed within ____ calendar days after date when Contract Time commences to run.

**PART 4 - ATTACHMENTS**

Following documents are attached to and made condition of this Bid, unless noted otherwise:

A. Substitution listing per the requirements of the Instructions to Bidders within 7 days after the day of the Bid opening.

B. List of alternates/alternatives.

C. List of Unit Prices.

D. Non-Collusion Affidavit.

E. A list of Subcontractors and other persons and organizations required to be identified, if so requested, per the requirements of the Instructions to Bidders within 7 days after the day of the Bid opening.

F. Required Bidders Qualification Statement for Structural Restoration Work with supporting data per requirements of Instructions to Bidders within 7 days after day of Bid opening. Use form attached to Section "Instructions to Bidders." Copies of previously prepared statements on this form which are less than 12 months old will be acceptable.

**PART 5 - SIGNATURES**

If BIDDER is:

**An Individual**

By _____ (SEAL)
(Individual's Name)

doing business as _____

Business Address: _____

_____

_____

Phone Number: _____

**A Partnership**

By _____ (SEAL)
(Firm Name)

_____
(General Partner)

_____
(General Partner)

Business Address: _____

_____

_____

Phone Number: _____

**A Corporation**

By _____
(Corporation Name)

_____
(State of Incorporation)

By _____
(Name of Person Authorized to Sign)

_____
(Title)

**(Corporate Seal)**

Attest _____
(Secretary)

Business Address: _____

_____

_____

Phone Number: _____

**A Joint Venture**

By _____
(Name)

_____
(Address)

By _____
(Name)

_____
(Address)

*Each joint venture member must sign. The manner of signing for each individual partnership and corporation that is party to joint venture should be in manner indicated above.*

**END OF SECTION 004100**

## SECTION 004310 – SUPPLEMENTS TO BID FORMS – RESTORATION

# WORK ITEM SCHEDULE

| WORK ITEM | DESCRIPTION | UNITS | TOTAL QUANTITY | UNIT COST | EXTENSION |
|---|---|---|---|---|---|
| **1.0** | **GENERAL REQUIREMENTS** | | | | |
| 1.1 | Project Mobilization | L.S. | 1 | | |
| 1.3 | Concrete Shores and Reshores | Incidental to W.I. 1.1 | | Incidental to W.I. 1.1 | |
| 1.4 | Concrete Reinforcement | Incidental to W.I. 1.1 | | Incidental to W.I. 1.1 | |
| 1.5 | Temporary Signage | Incidental to W.I. 1.1 | | Incidental to W.I. 1.1 | |
| 1.7 | Owner's Contingency | L.S. | 1 | 5% | |
| **3.0** | **CONCRETE FLOOR REPAIR** | | | | |
| 3.1 | Floor Repair - Partial Depth | SF | 35 | | |
| 3.4 | Floor Repair - Curbs/Walks | SF | 5 | | |
| 3.11 | Floor Repair - Slab-on-Grade | SF | 30 | | |
| 3.12 | Floor Repair - Spalled Constructin Joint at Slab-on-Grade | LF | 25 | | |
| **4.0** | **CONCRETE CEILING REPAIR** | | | | |
| 4.1 | Ceiling Repair - Partial Depth | SF | 20 | | |
| **6.0** | **CONCRETE COLUMN REPAIR** | | | | |
| 6.1 | Column Repair - Partial Depth | SF | 40 | | |
| **10.0** | **EXPANSION JOINT REPAIR AND REPLACEMENT** | | | | |
| 10.5 | Expansion Joint - Adhered | LF | 45 | | |
| 10.8 | Expansion Joint - Extruded Neoprene | LF | 100 | | |
| **11.0** | **CRACK AND JOINT REPAIR** | | | | |
| 11.1 | Route and Seal Cracks - Floor or Wall | LF | 200 | | |
| 11.2 | Repair Crack / Joint Sealant | LF | 760 | | |
| 11.5 | Epoxy Injection | LF | 10 | | |
| 11.7 | Cove Sealant | LF | 2590 | | |
| 11.8 | Cut/Grind Joint between Retaining Wall and Column | LF | 84 | | |
| 11.10 | Remove Grout/Provide Backer Rod and Sealant at Precast Coping | EA | 100 | | |
| 11.11 | Horizontal Joint Sealant Repair at Retaining Wall at Building Tunnel | LF | 35 | | |
| 11.12 | Horizontal Joint Sealant Repair at Retaining Wall Below Level 1 Entry/Exit | LF | 30 | | |
| **15.0** | **PROTECTIVE SEALER** | | | | |
| 15.1 | Concrete Sealer - Top Level, Exposed Ramp and Stairs | L.S. | 1 | | |
| **16.0** | **TRAFFIC TOPPING** | | | | |
| 16.1 | Traffic Topping - Vehicular at Floor Repair | SF | 40 | | |
| 16.2 | Traffic Topping - Pedestrian Walkway to Building Level 1. | SF | 460 | | |
| **25.0** | **MECHANICAL - DRAINAGE** | | | | |
| 25.2 | Mechanical - Supplementary Floor Drain | EA. | 6 | | |
| 25.3 | Mechanical - Supplementary Floor Drain Piping Allowance | LF | 60 | | |
| **30.0** | **ELECTRICAL - LIGHTING** | | | | |
| 30.4 | Electrical - New Light Fixtures Parking Garage See Note 2. | L.S. | 1 | | |
| 30.5 | Electrical - New Light Fixtures Judges Parking Area See Note 3. | L.S. | 1 | | |

# WORK ITEM SCHEDULE

| WORK ITEM | DESCRIPTION | UNITS | TOTAL QUANTITY | UNIT COST | EXTENSION |
|---|---|---|---|---|---|
| **35.0** | **CONCRETE MASONRY REPAIRS** | | | | |
| 35.1 | Tuckpointing at Masonry Wall Joints - Allowance | LF | 80 | | |
| 35.2 | Masonry Unit Replacement | EA | 4 | | |
| 35.3 | Masonry Unit Repair at Support Angle and Lintel Area | L.S. | 1 | | |
| 35.4 | Provide Backer Rod and Sealant between Masonry and Concrete Slab | LF | 420 | | |
| 35.5 | Remortar Joints at Loose Masonry Units at Stair Towers | EA | 4 | | |
| 35.6 | Route and Seal Cracks - Masonry Wall | LF | 18 | | |
| 35.7 | Replace Vertical Sealant between Brick and Masonry at Wall Opening | LF | 296 | | |
| **40.0** | **CONNECTIONS/BEARINGS** | | | | |
| 40.6 | Repair Broken Precast Panel Connections | EA | 2 | | |
| **44.0** | **MISCELLANEOUS** | | | | |
| 44.1 | Restress Loose Barrier Cables | EA | 70 | | |
| 44.2 | Cleaning and Degreasing Floors | L.S. | 1 | | |
| 44.3 | Precast Cap Stone Re-Anchoring | EA | 2 | | |
| 44.11 | Reattach Loose Lightning Protection Air Terminal Connection - Allowance | EA | 5 | | |
| 44.13 | Strengthen Base Connection of Cable Rails Support Tube | EA | 3 | | |
| **45.0** | **PAINTING** | | | | |
| 45.1 | Paint Traffic Markings - Level 2 and exposed portion of ramp. | L.S. | 1 | | |
| 45.2 | Paint Traffic Markings - Add Alternte Ground and Level 1 | L.S. | 1 | | |
| 45.3 | Paint Handrails and Guardrails Stair Towers | L.S. | 1 | | |
| 45.4 | Paint Doors and Frames | EA | 9 | | |
| 45.5 | Relocate ADA Stalls as Indicated on the plans. Ground and Level 1 | L.S. | 1 | | |
| 45.7 | Paint Interior Column Bases Covered Levels | L.S. | 1 | | |
| 45.8 | Paint Support Angles at CMU Walls | L.S. | 1 | | |
| 45.9 | Paint Column Pedestals Top Level | L.S. | 1 | | |
| 45.10 | Paint Steel Cable Rail Support and Base Plate | L.S. | 1 | | |
| 45.11 | Paint Precast Panel Connections | L.S. | 1 | | |
| 45..12 | Paint Steel Pipe Bollards and Bases | L.S. | 1 | | |
| **80.0** | **BRICK FAÇADE** | | | | |
| 80.1 | Exterior Brick Façade Repairs See Note 4 | L.S. | 1 | | |

NOTES:

1. XX - Lump Sum work to be performed on this level.
2. Refer to Electrical Drawings E-001 to E-501 by Engineered Systems & Services for new light fixture installation.
3. Refer to Electrical Drawings DE-204 and E-204 by Engineered Systems & Services for new light fixture installation in Judges Parking Area.
4. Refer to Architectural Drawings A4.1 and A4.2 by 2WR Partners for exterior brick façade repairs.

Description of Abbreviations:

XX = Level
L.F. = Lineal Feet
EA. = Each
S.F. = Square Feet
L.S. = Lump Sum

## 43.1 NON-COLLUSION AFFIDAVIT

Bidder, by its officers and its agents or representatives present at the time of filing this Bid, being duly sworn on their oaths say, that neither they nor any of them have in any way, directly or indirectly, entered into any arrangement or agreement with any other Bidder, or with any officer of General Growth Corporation whereby such affiant or affiants or either of them has paid or is to pay such other Bidder or officer any sum of money, or has given or is to give to such other Bidder or officer anything of value whatever, or such affiant or affiants or either of them has not directly or indirectly, entered into any arrangement or agreement with any other free competition into the letting of the contract sought for by the attached Bids that no inducement of any form or character other than that which appears on the face of the Bid will be suggested, offered, paid or delivered to any person whomsoever to influence the acceptance of the Bid or awarding of the Contract, nor has this Bidder any agreement or understanding of any kind whatsoever, with any person whomsoever to pay, deliver to, or share with any other person in any way or manner, any of the proceeds of the Contractor sought by this Bid.

Submitted By:

Type or print firm name:

_____

Authorized Signature

_____

Date

_____

## 43.2 LIST OF SUBCONTRACTORS

| | COMPANY<br>ADDRESS | CONTACT PERSON NAME<br>PHONE NUMBER<br>FAX NUMBER |
|---|---|---|
| Concrete Repairs | | |
| | | |
| | | |
| Sealants | | |
| | | |
| | | |
| Coatings | | |
| | | |
| | | |

**END OF SECTION 004310**

**SECTION 004513 – BIDDER'S QUALIFICATION STATEMENT - STRUCTURAL RESTORATION WORK**

This statement is required with the application to bid and as a qualification statement in advance of a restoration contract.

SUBMITTED TO: Troup County Government
100 Ridley Avenue, Suite 3100
LaGrange, Georgia, 30240
Attention: Diana Evans – Purchasing Director

SUBMITTED BY:

ADDRESS: _____

_____

PHONE: (_____) _____

CONTACT: _____

COMPANY STRUCTURE:
- __ Corporation
- __ Partnership
- __ Individual
- __ Joint Venture
- __ Other (Explain)

_____

_____

SPECIAL CERTIFICATIONS:
- __ MBE
- __ WBE
- __ Other (Explain): _____

_____

_____

SUBMITTAL DATE: _____

AREA(S) OF EXPERTISE: (Check all that apply)
- __ Structural Concrete Repair
- __ Waterproofing/Jts. & Sealants
- __ Waterproofing/Traffic Toppings & Sealers
- __ Waterproofing/Roofing
- __ Waterproofing/Plaza Systems
- __ Concrete Flatwork
- __ Brick/Masonry
- __ Historic Buildings
- __ _____
- __ _____

**STRUCTURAL RESTORATION CONTRACTOR'S QUALIFICATION QUESTIONNAIRE**

1. How many years has your organization been in business as a structural restoration contractor? _____ Starting Year: _____

2. How many years has your organization been in business as a general contractor? _____ Starting Year: _____

3. How many years has your organization been in business under its present business name? _____ Starting Year: _____

4. List states in which your organization is legally qualified to do business.

5. What percentage of the work do you normally perform with your own work forces?

6. List on **Table I** the last five parking facility/bridge deck structural restoration projects your firm has completed.

7. List on **Table II** the structural restoration projects your organization has in progress at this time.

8. Have you ever failed to complete any work awarded to you? If so, attach a separate sheet of explanation.

9. Has any officer or partner of your organization ever been an officer or partner of another organization that failed to complete a construction contract? If so, attach a separate sheet of explanation.

10. List on **Table III** the construction experience of the principals and superintendents of your company.

11. What is your present bonding capacity? $_____ per Project,

    $_____ Aggregate

12. Who is your bonding agent?

    NAME: _____

    ADDRESS: _____

    PHONE: (_____) _____

    CONTACT: _____

13. Are you rated by any State Highway Departments? If so, please list which states on **Table IV** and your company's rating.

14. List on **Table V** the equipment you own that is available for restoration work.

15. Are there any liens against the above? _____ If so, total amount $_____

16. Attach your company's most recent audited Balance Sheet, prepared in accordance with generally accepted accounting principles.

    Date of Balance Sheet: _____

    Name of firm Balance Sheet: _____

    DATED AT _____ THIS ____ DAY OF _____, 20_____.

    Name of Organization: _____

        By: _____

        TITLE: _____

        STATE OF: _____

        COUNTY OF: _____

_____ being duly sworn, deposes and says that he/she is _____ of the above organization and that the answers to the questions in the foregoing questionnaire and all statements therein contained are true and correct.

SUBSCRIBING AND SWORN TO BEFORE ME THIS _____ DAY OF 20_____.

NOTARY PUBLIC:_____

MY COMMISSION EXPIRES: _____

| TABLE I - LAST FIVE RESTORATION JOBS COMPLETED | | | |
|---|---|---|---|
| Name and Address of Contractor | | | Date: |
| Name and Address of Owner | Type of Restoration Work | Contract Amount | Date Completed |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

| TABLE II - LIST OF STRUCTURAL RESTORATION IN PROGRESS | | | |
|---|---|---|---|
| Name and Address of Contractor | | | Date: |
| Name and Address of Owner | Type of Work | Contract Amount | Expected Completion Date |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

| TABLE III - CONSTRUCTION EXPERIENCE OF PRINCIPALS AND SUPERINTENDENTS | | | | | |
|---|---|---|---|---|---|
| Name and address of Contractor: | | | | | Date: |
| Name | Position | Years Experience | | Type of Work | Contract Amount |
| | | Construction | Restoration | | |
| | | | | | |

| TABLE IV - RATINGS BY STATE HIGHWAY DEPARTMENTS | | | |
|---|---|---|---|
| Name and address of Contractor: | | | Date: |
| State | Rating | Contact & Phone No. | Highway Jobs for Ea. State |
| | | | |

| TABLE V - LIST OF EQUIPMENT | | | |
|---|---|---|---|
| Name and address of Contractor: | | | Date: |
| Description of Equipment | Quantity | Years of Service | Current Book Value |
| | | | |

**END OF SECTION 004513**

**CONTRACT REQUIREMENTS**

## SECTION 00 52 00 - AGREEMENT FORM

### PART 1 - GENERAL

**1.1** Written Agreement will be executed on AIA Document A101 -2017, "STANDARD FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR, WHERE THE BASIS OF PAYMENT IS A STIPULATED SUM."

**1.2** Copies of Sample Agreement Form are available for examination at office of Engineer.

**1.3** Contractor may purchase copies of Agreement Form from The American Institute of Architects, 1735 New York Avenue, N.W., Washington, DC 20006.

**1.4** Liquidated damages will be included in Article 4 of Agreement.

**1.5** Retainage for progress payments will be in accordance with Supplementary Conditions, SC-9.3.

**END OF SECTION 00 52 00**

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## SECTION 00 61 13 – PERFORMANCE AND PAYMENT BOND

### PART 1 - GENERAL

**1.1** Performance Bond and payment Bonds shall be executed on AIA Document A312-2010, "PERFORMANCE BOND AND PAYMENT BOND," in accordance with General Conditions.

**1.2** Sample copies of Bond forms are available for examination at office of Engineer.

**1.3** Contractor may purchase copies of Agreement from The American Institute of Architects, 1735 New York Avenue, N.W., Washington, D.C. 20006.

**END OF SECTION 00 61 13**

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**CONDITIONS OF THE CONTRACT**

**SECTION 00 72 00 - GENERAL CONDITIONS**

**PART 1 - GENERAL**

**1.1** AIA Document A201-2017, "GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION," Articles 1 through 15 inclusive, is hereby made part of Contract Documents.

**1.2** Sample copies of General Conditions are available for examination at office of Engineer.

**1.3** Contractor may purchase copies of Agreement Form from The American Institute of Architects, 1735 New York Avenue, N.W., Washington, DC 20006.

**1.4** Supplementary Conditions Section shall amend or supplement General Conditions. All provisions of General Conditions not amended or supplemented by Supplementary Conditions remain in full force and effect.

**END OF SECTION 00 72 00**

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# SECTION 007300 - SUPPLEMENTARY CONDITIONS

## PART 1 - GENERAL

**1.1** The following supplements modify AIA Document A201–2017, General Conditions of the Contract for Construction. Where a portion of the General Conditions is modified or deleted by these Supplementary Conditions, the unaltered portions of the General Conditions shall remain in effect.

### 1.2 SC-1.1 BASIC DEFINITIONS

A. Add the following to 1.1.1. - THE CONTRACT DOCUMENTS

B. Add the following to 1.1.4 - THE PROJECT

The Term Project as used herein shall mean:

TROUP COUNTY GOVERNMENT EAST PARKING GARAGE RESTORATION

Add the following subparagraphs 1.1.8 and 1.1.9 to 1.1

C. Add the following to 1.1.7 – INSTRUMENTS OF SERVICE

The Term Project Manual as used herein shall mean: A volume assembled for the Work which may include the bidding requirements, sample forms, Conditions of the Contract and Specifications.

D. 1.1.9 ENGINEER

Terms Engineer and Architect as used herein shall be as follows. Term Engineer as used herein shall mean:

Walker Consultants
4904 Eisenhower Boulevard, Suite 150
Tampa, FL 33634

Term Architect as used herein shall mean:

2WR Architecture
11 Ninth Street, Suite 120
Columbus, GA 31901

E. 1.1.10 UNIT PRICE WORK

Unit Price Work is Work to be paid for on basis of unit prices.

## 1.3 SC-1.2. CORRELATION AND INTENT OF THE CONTRACT DOCUMENTS

Add following subparagraphs 1.2.4 to 1.2:

1.2.4 - Reference to standard specifications, manuals, or codes of any technical society, organization, or association, or to laws or regulations of any governmental authority, whether such reference be specific or by implication, shall mean latest standard specification, manual, code, laws, or regulations in effect at time of opening of Bids (or, on Effective Date of Agreement if no Bids), except as may be otherwise specifically stated. However, no provision of any referenced standard specification, manual, or code (whether or not specifically incorporated by reference in Contract Documents) shall be effective to change duties and responsibilities of Owner, Contractor, or Architect, or any of their consultants, agents, or employees from those set forth in Contract Documents, nor shall be effective to assign to Architect, or any of Architect's consultants, agents, or employees, any duty or authority to supervise or direct furnishing or performance of Work, or any duty or authority to undertake responsibility contrary to General Conditions.

## 1.4 SC-2.1 GENERAL

Add following to 2.1.1:
Term Owner as used herein shall mean:

Troup County Government
100 Ridley Avenue
LaGrange, GA

## 1.5 SC-2.2 INFORMATION AND SERVICES REQUIRED OF THE OWNER

Delete subparagraph 2.2.5 and substitute following:

2.2.5 - The Owner shall furnish the Contractor an electronic copy of the Contract Documents in pdf format. No hardcopies will be provided. The Contractor may make copies of the electronic file for their own use at Contractor’s expense.

## 1.6 SC-3.4 LABOR AND MATERIALS

Add following to 3.4.1:

All materials and equipment shall be applied, installed, connected, erected, used, cleaned, and conditioned in accordance with instructions of applicable supplier except as otherwise provided in Contract Documents; but no provisions of any such instructions will be effective to assign to Architect, or any of Architect's consultants, agents, or employees any duty or authority to undertake responsibility contrary to General Conditions.

Add following subparagraphs 3.4.4, 3.4.5, and 3.4.6 to 3.4:

3.4.4 - After Contract has been executed, Owner and Architect will consider formal request for substitution of products in place of those specified only under conditions set forth in General Requirements (Division 1 of Specifications).

3.4.5 - By making requests for substitutions based on subparagraph 3.4.3 above, Contractor:

1. Represents that Contractor has personally investigated proposed substitute product and determined that it is equal or superior in all respects to that specified.
2. Represents that Contractor will provide same warranty for substitution that Contractor would for that specified.
3. Certifies that cost data presented is complete and includes all related costs under this Contract except Architect's redesign costs, and waives all claims for additional costs related to substitution which subsequently become apparent, and
4. Will coordinate installation of accepted substitute, making such changes as may be required for Work to be complete in all respects.

3.4.6 - Architect's decision of approval or disapproval of proposed substitution shall be final.

## 1.7 SC-3.7 PERMITS, FEES AND NOTICES

Add following to 3.7.2:

Except where otherwise expressly required by applicable laws, ordinances, rules, regulations and lawful orders of public authorities, neither Owner nor Architect shall be responsible for monitoring Contractor's compliance with any applicable law, ordinance, rule, regulation and lawful order of public authorities.

## 1.8 SC-3.10 CONTRACTOR'S CONSTRUCTION SCHEDULES

Add following to 3.10.2:

If required by Architect, schedule of submittals shall be adjusted to provide workable arrangement for processing submittals.

## 1.9 SC-3.12 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

Add the following sentence to subparagraph 3.12.5:

Submittals made by Contractor which are not required by Contract Documents will be returned immediately with notation “Submittal Not Required No Review Performed”.

Add following subparagraphs 3.12.11 through 3.12.17 to 3.12:

3.12.11 - Submission to Architect of Shop Drawings and samples approved by Contractor and review of said Shop Drawings and samples by Architect shall not constitute submission in writing or approval in writing of any deviation from requirements of Contract Documents unless the Contractor has specifically informed the Architect in writing of such deviation at the time of the submittal and the Contractor has received written approval or authorization in accordance with 3.12.8.

3.12.12 - Changes to Drawings and Specifications by means of Shop Drawings become responsibility of party initiating such changes.

3.12.13 - Submission to Architect of Shop Drawings and samples approved by Contractor and review of said Shop Drawings and samples by Architect shall not imply that any requirements of Contract Documents have been waived or superseded.

3.12.14 - No delay or omission to exercise any right or remedy accruing to Architect upon any breach or event of default of Contractor shall impair any such right or remedy to be construed to be waiver of any such breach or default; nor shall any waiver of any single breach or default be deemed waiver of any other, prior, or subsequent breach or default. Any waiver, permit, consent, or approval on part of Architect of any breach or default, or of any provision or condition hereof, must be in writing and shall be effective only to extent that such writing specifically sets forth.

3.12.15 - Architect's stamp on Shop Drawing shall not imply approval of quantities, dimensions, fabrication processes and techniques of construction, all of which shall remain responsibility of Contractor.

3.12.16 - Architect's stamp on Shop Drawing shall not relieve Contractor from responsibility for errors or omissions in Shop Drawing and shall not imply that Contractor may proceed in error.

3.12.17 - Shop Drawings and samples shall be submitted in accordance with procedures of Section 013300.

## 1.10 SC-3.18 INDEMNIFICATION

Add following subparagraph 3.18.3 to 3.18:

3.18.3 - Contractor shall agree that total aggregate liability for consequential and incidental damages (but not direct damages) suffered with respect to professional negligence associated or connected with Drawings and Specifications from which Contractor prepared Contract Bid Price and for which Owner, Architect, and their agents or consultants may be liable, shall be limited to amount not to exceed $100,000. Contractor shall further agree that with respect to each subcontractor, Contractor will obtain as condition precedent to subcontractor's performance, agreement that foregoing limitation of liability for consequential and incidental damages (but not direct damages) shall not in aggregate exceed $100,000 for all Contractor's subcontractors. It is understood and agreed between parties hereto that this provision shall be confined in application to only those matters affecting Contract

Bid Price and shall not affect any party's liability for personal injury or property damage arising or resulting from sole negligence of any party, its agents or employees.

## 1.11 SC-4.1 ARCHITECT

Delete first sentence of subparagraph 4.1.1 and replace with following:

Architect is person or entity identified as such in Agreement and is referred to throughout Contract Documents as if singular in number.

## 1.12 SC-4.2 ADMINISTRATION OF THE CONTRACT

Add following subparagraph 4.2.15 through 4.2.20 to 4.2:

4.2.15 – Architect's terminology on Shop Drawing review stamp of "NO EXCEPTION TAKEN" shall mean that Architect has reviewed and approved Shop Drawing so stamped only for conformance with design concept of Project as given in Contract Documents.

4.2.16 – Architect's terminology on Shop Drawing review stamp of "MAKE CORRECTIONS NOTED – RESUBMITTAL NOT REQUIRED" shall mean that Architect has reviewed and approved Shop Drawing so stamped, subject to corrections made on Shop Drawing, only for conformance with design concept of Project as given in Contract Documents.

4.2.17 – Architect's terminology on Shop Drawing review stamp of "REJECTED" shall mean that Architect has not approved the Shop Drawing so stamped, subject to corrections made on Shop drawing and resubmittal is required.

4.2.18 – Architect's terminology on Shop Drawing review stamp of "REVISE AND RESUBMIT" shall mean that Architect has reviewed and not approved Shop Drawing, only for conformance with design concept of Project as given in Contract Documents and resubmittal is required.

4.2.19 – Architect's terminology in Shop Drawing review stamp of "SUBMITTAL NOT REQUIRED NO REVIEW PERFORMED" shall mean that submittal is not required by specification or resubmittal was not required and Architect has not reviewed the shop drawings.

4.2.20 - Unit Prices: Architect will review and approve actual quantities and determine classification of Unit Price Work performed by Contractor. Architect will review Contractor's preliminary determinations on such matters before rendering written decision thereon (by recommendation of Application for Payment or otherwise). Architect's written decisions thereon will be final and binding upon Owner and Contractor, unless, within ten days after date of any such decision, either Owner or Contractor delivers to other party to Agreement and to Architect written notice of intention to appeal from such decision.

## 1.13 SC-5.2 AWARD OF SUBCONTRACTS AND OTHER CONTRACTS FOR PORTIONS OF THE WORK

Add following to 5.2.1:

In accordance with Supplementary Instructions to Bidders, submit names of following subcontractors, suppliers, persons and organizations for approval by Owner and Architect before award of Contract:

| TRADE | COMPANY | LOCATION |
|---|---|---|
| Demolition | | |
| Concrete Repairs | | |
| Brick and Masonry Repairs | | |
| Protective Sealer | | |
| Traffic Topping | | |
| Expansion Joints, Sealants and Caulking | | |
| Painting | | |
| Pavement Markings | | |
| Electrical Lighting | | |
| Plumbing | | |

## 1.14 SC-7.1 GENERAL

Add the following subparagraphs 7.1.4 to 7.1:

7.1.4 INCREASED OR DECREASED WORK ITEM QUANTITIES

Engineer shall have right under contract to make increases and decreases in quantities and changes in plans, as may be necessary to ensure completion of contemplated work. Increases or decreases of any item of work will be made at the contract unit price.

## 1.15 SC-7.3 CONSTRUCTION CHANGE DIRECTIVES

In first sentence of subparagraph 7.3.7, delete words "including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount."

Delete Clauses 7.3.7.1 through 7.37.5 and replace with following:

1. Cost of labor, including social security, old age and unemployment insurance, fringe benefits required by agreement or custom, and workers' or workmen's compensation insurance, plus 20% of sum thereof;
2. Cost of materials, supplies and equipment, including cost of transportation, whether incorporated or consumed, plus 15% of sum thereof;
3. Rental costs of machinery and equipment, exclusive of hand tools, whether rented from Contractor or others, plus 15%;
4. Cost of premiums for all bonds and insurance, permit fees, and sales, use or similar taxes related to Work, plus 15% of sum thereof;
5. Compensation as herein provided shall be accepted by Contractor as payment in full for extra Work done on this basis and said percentages shall cover profit, superintendence, general expense, overhead, and use of small tools and equipment for which no rental is allowed.

## 1.16 SC-9.2 SCHEDULE OF VALUES

Add following subparagraph 9.2.2 to 9.2:

9.2.2 - Progress payments on account of Unit Price Work will be based on number of units completed.

## 1.17 SC-9.3 APPLICATIONS FOR PAYMENT

Add following sentence to subparagraph 9.3.1:

Form of Application for Payment shall be notarized AIA Document G702, Application and Certification for Payment, supported by AIA Document G703, Continuation Sheet.

Add following clause 9.3.1.3 to 9.3.1:

9.3.1.3 - Until Substantial Completion, Owner shall pay 90% of amount due Contractor on account of progress payments.

Add following subparagraph 9.3.4 to 9.3:

9.3.4 - Unit Price Work:

1. Where Contract Documents provide that all or part of Work is to be Unit Price Work, initially Contract Sum will be deemed to include for all Unit Price Work amount equal to sum of established unit prices for each separately identified item of Unit Price Work times estimated quantity of each item as indicated in Agreement. Estimated quantities of items of Unit Price Work are not guaranteed and are solely for purpose of comparison of Bids and determining initial Contract Sum. Review and approval of actual quantities and classifications of Unit Price Work performed by Contractor will be by Architect in accordance with SC-4.2, subparagraph 4.2.15.

2. Each unit price will be deemed to include amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.
3. Where quantity of any item of Unit Price Work performed by Contractor differs materially and significantly from estimated quantity of such item indicated in Agreement and there is no corresponding adjustment with respect to any other item of Work and if Contractor believes Contractor has incurred additional expense as result thereof, Contractor may make claim for increase in Contract Sum in accordance with Article 7 if parties are unable to agree as to amount of any such increase.

## 1.18 SC-9.8 SUBSTANTIAL COMPLETION

Add following sentence to subparagraph 9.8.5:

Payment shall be sufficient to increase total payments to 95% of Contract Sum, less such amounts as Architect shall determine for incomplete Work and unsettled claims.

## 1.19 SC-9.11 LIQUIDATED DAMAGES

Add the following paragraph 9.11 to Article 9:

9.11.1 - Contractor and Contractor's surety, if any, shall be liable for and shall pay Owner sums hereinafter stipulated as liquidated damages for each calendar day of delay until Work is substantially complete:

**Three Hundred Dollars ($300.00 ).**

## 1.20 SC-11.1 CONTRACTOR'S LIABILITY INSURANCE

Add following subparagraph 11.1.5, to 11.1:

11.1.5 - Other Requirements:

1. Owner reserves right to request complete copies of policies if deemed necessary to ascertain details of coverage not provided by certificates. Such policy copies shall be "Originally Signed Copies," and so designated.
2. Qualification of Insurers: In order to determine financial strength and reputation of insurance carriers, all companies providing coverages required shall have financial rating not lower than XII and policyholder's service rating no lower than A as listed in A.M. Best's Key Rating Guide, current edition. Companies with ratings lower than A: XII will be acceptable only upon written consent of Owner.
3. Subrogation Clause: Following subrogation clause shall appear in all policies of insurance, "Subrogation Clause": It is hereby stipulated that this insurance shall not be invalidated should insured waive in writing prior to loss any or all right of recovery against any party for loss occurring to property described herein.

**END OF SECTION 007300**

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# SECTION 00 90 00 – REVISIONS, CLARIFICATIONS, AND MODIFICATIONS

## PART 1 - GENERAL

### 1.1 ADDENDA AND MODIFICATIONS TO PROJECT ARE CONTAINED ON FOLLOWING PAGES.

## PART 2 - (NOT APPLICABLE)

## PART 3 - (NOT APPLICABLE)

## END OF SECTION 00 90 00

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# SECTION 011110 - SUMMARY OF WORK - RESTORATION

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract and other Division 1 Specification Sections apply to this Section.

### 1.2 PROJECT DESCRIPTION

A. Work will be performed at locations within the parking structure and Judges Parking Areas as shown on Drawings.

B. Work required in these areas and estimated quantities are listed on Bid Form. Bid Quantities associated with Work Items listed on Drawings have been estimated and are subject to measurement as defined in Article "Measurements." Where additional Work Items are described, but not specifically located and/or shown on Drawings, Contractor shall be responsible for locating and marking areas to be repaired. Owner and/or Engineer reserves right to increase or decrease quantities up to 25% at same unit cost, as required by job conditions.

C. Work Item specifications and details shall govern all repair operations. Locations where Work Items apply are shown on Drawings as symbols.

D. Final payment shall be made on basis of actual approved Work performed as measured in place.

E. Project is comprised of maintenance repairs and lighting upgrades for The Troup County Government Center East Parking Garage along with lighting upgrades for the Judges Parking Area in LaGrange Georgia.

F. Work consists of replacement of sealants, application of water repellants, crack repairs, concrete patching, miscellaneous repairs to the barrier cables, painting, masonry and brick repairs, restriping of the top level and light fixture replacement.

1. Work Items shown in contract documents shall be completed by contractors who specialize in the respective trade.

### 1.3 MEASUREMENTS

A. Before ordering any material or doing any Work, Contractor shall verify all measurements at Project site and shall be responsible for correctness of same.

B. Before proceeding with each Work Item, Contractor shall locate, mark, and measure quantity of each item and report quantities to Engineer. If measured quantities exceed Engineer's estimate, Contractor shall obtain written authorization to proceed from Owner before executing Work required for that Work Item.

C. Measurement of quantities for individual Work Items will be performed by Contractor and reviewed by Engineer.

D. Cost of Work included in each Work Item for quantities as indicated in Contract Documents shall be included in Base Bid.

1. Additions to or deductions from lump sum price for quantities of each Work Item added to or deducted from Work respectively shall be at unit prices indicated in Bid Form and shall constitute payment or deductions in full for all material, equipment, labor, supervision and incidentals necessary to complete Work.

## 1.4 WORK SEQUENCE

A. Prior to commencement of work, meet with Owner representatives to establish sequence and schedule of Work. Contractor shall give Owner notice of areas to be cleared of cars at least 3 working days in advance of actual Work.

B. Contractor shall remove all broken concrete and debris from Work area on daily basis and dispose of same at authorized dump sites.

C. Contractor shall remove dust and air transported sand/debris from remainder of facility at conclusion of operations in Work area.

D. Work shall be substantially completed within 4 months and fully completed within 5 months of the issuance of the Notice to Proceed. Owner intends to issue Notice to Proceed after approval by the County Commission.

1. Coordinate work areas with Parking Operations at the Troup County Parkiing Garage.

E. Contractor will not be limited on the total number of parking stalls taken through Substantial Completion. Following Substantial Completio, contractor will be limited to a maximum number of parking stalls as allowed by Parking Operations.

## 1.5 CONTRACTOR USE OF PREMISES

A. General: Limit use of premises to construction activities in areas agreed to in advance with Owner; allow for Owner occupancy and use by public of all other areas.

1. Confine operations to areas within Contract limits indicated on the drawings. Portions of the site beyond areas in which construction operations are indicated are not to be disturbed.

2. Keep driveways and entrances serving the premises clear and available to the Public and Owner's employees at all times. Do not use these areas for parking or storage of materials. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on site.
3. Burial of Waste Materials: Do not dispose of any construction waste material on site, either by burial or by burning.
4. Parking stalls may not be blocked off without first coordinating with Parking Operations.
5. Work within drive aisles must be coordinated with Parking Operations. Work may need to be completed at nights or on weekends.

B. Contractor's use of premises shall not interfere with operation of same. Elevators shall not be used for transfer of materials or equipment.

C. Contractor's debris removal path shall be over non-repaired services unless physical restraints prevent use of such path.

D. Contractor shall confine its apparatus, materials, equipment, tool cribs, field offices and operations to areas designated by Owner and/or Engineer. Premises shall not be unreasonably encumbered with materials and equipment. Neat and orderly stockpiling and other operations shall be maintained and debris shall be regularly removed from site. Contractor shall not load or permit any part of structure to be loaded with weight that will endanger structural integrity or safety of facility. Contractor shall limit axle loads to maximum 4000 lb per axle and gross weight of 8000 lb, or stockpiling of materials and equipment to 50 lb per sq ft. Contractor to note existing height restrictions within parking structure.

E. Contractor Parking: Contractor's employees shall park within confines of work area or where directed by Owner.

F. On-Site Storage: Contractor shall not store materials or equipment at site of Work for more than one week prior to time that materials or equipment are incorporated into Work.

G. Contractor is required to provide a wireless weather station at the job sit. Data from the weather station is required to support weather related delay claims.

H. Damaged landscaping as a result of contractor’s work activities shall be replaced. If new plant materials cannot be obtained in the size, type and quantity to match the surrounding plant materials, the contractor will be required to replace a larger area.

1. The contractor is responsible for ensuring the irrigation is operational in the areas between the garage and the roadway upon completion of the project. Contractor shall investigate and report any existing problems with the system prior to starting work.

I. Contractor is responsible for tree and shrub trimming as needed to accomplish the scope of work in the contract documents.

J. Areas of the parking garage outside of the current phase limit will remain in use during construction. The contractor may not interfere with the use of any area outside of the phase limit.

## 1.6 BARRICADES

A. Provide positive barricading to separate Work areas from areas open to public and to prevent the need for washing cars parked adjacent to the work area. Provide additional barriers as required to prevent damage to vehicles due to airborne debris.

## 1.7 FLAGMEN

A. When, in Owner's opinion, it is necessary that flagmen be used to protect and control pedestrian traffic, to direct vehicular traffic during construction and to keep traffic off any part of Work, or to protect public safety, a flagmen detail will be provided by the Contractor.

## 1.8 CLAIMS

A. Contractor shall promptly address all damages claims. Owner reserves right to resolve any claims not addressed by Contractor within 3 wks after claim is received by Contractor. Any amounts paid by Owner will be deducted from Contractor's next progress payment.

## 1.9 OWNER OCCUPANCY

A. Partial Owner Occupancy: Owner reserves the right to occupy and to place and install equipment in completed areas of garage, prior to Substantial Completion provided that such occupancy does not interfere with completion of Work. Such placing of equipment and partial occupancy shall not constitute acceptance of total Work.

1. Certificate of Substantial Completion will be executed for each specific portion of Work to be occupied prior to Owner occupancy.

## PART 2 - PRODUCTS (NOT APPLICABLE)

## PART 3 - EXECUTION (NOT APPLICABLE)

## END OF SECTION 011110

# SECTION 012100 – ALLOWANCES

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of 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 governing handling and processing allowances.

1. Selected materials and equipment, and in some cases, their installation are shown and specified in Contract Documents by allowances. Allowances have been established in lieu of additional requirements and to defer selection of actual materials and equipment to a later date when additional information is available for evaluation. Additional requirements, if necessary, will be issued by Change Order.

B. Types of allowances required include following:

1. Contingency allowances.

C. Procedures for submitting and handling Change Orders are included in Division 01 Section "Contract Modification Procedures."

### 1.3 DEFINITIONS

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

### 1.4 SELECTION AND PURCHASE

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

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

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

## 1.5 QUANTITY ALLOWANCES

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

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

## 1.6 SUBMITTALS

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

B. Submit invoices or delivery slips to indicate actual quantities of materials delivered to site for use in fulfillment of each allowance.

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

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

## 1.7 CONTINGENCY ALLOWANCES

A. Use contingency allowance only as directed for Owner's purposes, and only by Change Orders which designate amounts to be charged to the allowance.

B. Contractor's overhead, profit, and related costs for products and equipment ordered by Owner under the contingency allowance are included in the allowance and are not part of the Contract Sum. These costs include delivery, installation, taxes, insurance, equipment rental, and similar costs.

C. Change Orders authorizing use of funds from the contingency allowance will include Contractor's related costs and reasonable overhead and profit.

D. At Project closeout, credit unused amounts remaining in the contingency allowance to Owner by Change Order.

## 1.8 ADJUSTMENT OF ALLOWANCES

A. Allowance Adjustment: To adjust allowance amounts, prepare a Change Order proposal based on the difference between purchase amount and the allowance, multiplied by final measurement of work-in-place where applicable. If applicable,

include reasonable allowances for cutting losses, tolerances, mixing wastes, normal product imperfections, and similar margins.

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

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

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

## PART 2 - PRODUCTS (NOT APPLICABLE)

## PART 3 - EXECUTION

### 3.1 EXAMINATION

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

### 3.2 PREPARATION

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

### 3.3 SCHEDULE OF ALLOWANCES

A. Refer to the Work Item Schedule on Drawing R-001.

**END OF SECTION 012100**

# SECTION 012600 - CONTRACT MODIFICATION PROCEDURES

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 SUMMARY

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

B. Related Sections: Following Sections contain requirements that relate to this Section:

1. Division 1 Section "Unit Prices" for administrative requirements governing use of unit prices.
2. Division 1 Section "Payment Procedures" for administrative procedures governing applications for payment.

### 1.3 MINOR CHANGES IN WORK

A. Supplemental instructions authorizing minor changes in Work, not involving an adjustment to Contract Sum or Contract Time, will be issued by Engineer on AIA Form G710, Architect's Supplemental Instructions.

### 1.4 CHANGE ORDER PROPOSAL REQUESTS

A. Owner-Initiated Proposal Requests: Proposed changes in Work that will require adjustment to Contract Sum or Contract Time will be issued by Construction Manager with detailed description of proposed change and supplemental or revised Drawings and Specifications, if necessary.

1. Proposal requests issued by Construction Manager are for information only. Do not consider them instruction either to stop work in progress, or to execute proposed change.
2. Unless otherwise indicated in proposal request, within 3 days of receipt of proposal request, submit to Engineer for Owner's review an estimate of cost necessary to execute proposed change.

    a. Include list of quantities of products to be purchased and unit costs, along with total amount of purchases to be made. Where requested, furnish survey data to substantiate quantities.

b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
c. Include statement indicating effect proposed change in Work will have on Contract Time.

B. Contractor-Initiated Change Order Proposal Requests: When latent or other unforeseen conditions require modifications to Contract, Contractor may propose changes by submitting request for change to Construction Manager.

1. Include statement outlining reasons for change and effect of change on Work. Provide complete description of proposed change. Indicate effect of proposed change on Contract Sum and Contract Time.
2. Include list of quantities of products to be purchased and unit costs along with total amount of purchases to be made. Where requested, furnish survey data to substantiate quantities.
3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
4. Comply with requirements in Section “Product Substitutions” if proposed change in Work.
5. Submit request no later than 3 working days after discovery of condition.

C. Proposal Request Form: Use AIA Document G709 for Change Order Proposal Requests.

## 1.5 CONSTRUCTION CHANGE DIRECTIVE

A. Construction Change Directive: When Owner and Contractor are not in total agreement on terms of Change Order Proposal Request, Construction Manager may issue Construction Change Directive, instructing Contractor to proceed with change in Work, for subsequent inclusion in Change Order.

B. Construction Change Directive will contain complete description of change in Work and designate method to be followed to determine change in Contract Sum or Contract Time.

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

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

## 1.6 CHANGE ORDER PROCEDURES

A. Upon Owner's approval of Change Order Proposal Request, Construction Manager will issue Change Order for signatures of Owner and Contractor.

**PART 2 - PRODUCTS (NOT APPLICABLE)**

**PART 3 - EXECUTION (NOT APPLICABLE)**

**END OF SECTION 012600**

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# SECTION 012900 - PAYMENT PROCEDURES

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 SUMMARY

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

B. Related Sections include the following:

1. Division 1 Section "Supplement to Bid Forms - Restoration" for administrative requirements governing use of unit prices.
2. Division 1 Section "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.

### 1.3 DEFINITIONS

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

### 1.4 SCHEDULE OF VALUES

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

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

a. Application for Payment forms with Continuation Sheets.
b. Submittals Schedule.

2. Submit the Schedule of Values to Engineer at earliest possible date but no later than seven days before the date scheduled for submittal of initial Applications for Payment.

B. Format and Content: Use the Project Manual list of “Work Items” as a guide to establish line items for the Schedule of Values. Provide at least one line item for each Work Item.

1. Identification: Include the following Project identification on the Schedule of Values:

    a. Project name and location.
    b. Name of Engineer.
    c. Engineer's project number.
    d. Contractor's name and address.
    e. Date of submittal.

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

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

        1) Quantity of an individual work item completed, multiplied by the approved unit rate or, if lump sum, percent of work item completed multiplied by lump sum price.

3. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the Project Manual table of contents.
4. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
5. Provide a separate line item in the Schedule of Values for each part of individual work items where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.

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

6. Provide separate line items in the Schedule of Values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
7. Each item in the Schedule of Values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.

    a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the Schedule of Values or distributed as general overhead expense, at Contractor's option.

8. Schedule Updating: Update and resubmit the Schedule of Values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

## 1.5 APPLICATIONS FOR PAYMENT

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

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

B. Payment Application Times: The date for each progress payment is indicated in the Agreement between Owner and Contractor. The period of construction Work covered by each Application for Payment is the period indicated in the Agreement.

C. Payment Application Forms: Use AIA Document G702 and AIA Document G703 Continuation Sheets as form for Applications for Payment or forms required by Owner.

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

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

E. Transmittal: Submit 3 signed and notarized original copies of each Application for Payment to Owner by a method ensuring receipt within 24 hours. One copy shall include waivers of lien and similar attachments if required.

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

F. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's lien from every entity who is lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by the payment.

1. Submit partial waivers on each item for amount requested, before deduction for retainage, on each item.
2. When an application shows completion of an item, submit final or full waivers.
3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
4. Waiver Delays: Submit each Application for Payment with Contractor's waiver of mechanic's lien for construction period covered by the application.

    a. Submit final Application for Payment with or preceded by final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.

5. Waiver Forms: Submit waivers of lien on forms, executed in a manner acceptable to Owner.

G. Initial and Progressive Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:

1. Schedule of Values
2. Contractor's Construction Schedule (preliminary if not final).

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

1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
2. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.

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

1. Evidence of completion of Project closeout requirements.
2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
3. Updated final statement, accounting for final changes to the Contract Sum.
4. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims."
5. AIA Document G706A, "Contractor's Affidavit of Release of Liens."
6. Evidence that claims have been settled.

**PART 2 - PRODUCTS (NOT APPLICABLE)**

**PART 3 - EXECUTION (NOT APPLICABLE)**

**END OF SECTION 012900**

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

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

1. Division 01 Section "Construction Progress Documentation" for preparing and submitting the Contractor's Construction Schedule.
2. Division 01 Section "Closeout Procedures" for coordinating Contract closeout.

### 1.3 COORDINATION

A. Coordination: Coordinate construction operations included in various Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different sections that depend on each other for proper installation, connection, and operation.

1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
2. Coordinate installation of different components with other contractors to ensure maximum accessibility for required maintenance, service, and repair.
3. Make adequate provisions to accommodate items scheduled for later installation.

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

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

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

1. Preparation of Contractor's Construction Schedule.
2. Preparation of the Schedule of Values.
3. Installation and removal of temporary facilities and controls.
4. Delivery and processing of submittals.
5. Progress meetings.
6. Pre-installation conferences.
7. Project closeout activities.

## 1.4 SUBMITTALS

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

1. Indicate relationship of components shown on separate Shop Drawings.
2. Indicate required installation sequences.

## 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.

## 1.6 PROJECT MEETINGS

A. General: Schedule and conduct meetings and conferences at Project site, unless otherwise indicated.

1. Attendees: Construction Manager to inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Engineer of scheduled meeting dates and times.
2. Agenda: Construction Manager to prepare the meeting agenda. Distribute the agenda to all invited attendees.
3. Minutes: Construction Manager to record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Engineer, within 5 working days of the meeting.

B. Preconstruction Conference: Construction Manager shall schedule a preconstruction conference before starting construction, at a time convenient to Owner, and Engineer, but no later than 10 working days after execution of the Agreement. Hold the conference at Project site or another convenient location. Conduct the meeting to review responsibilities and personnel assignments.

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

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

C. Progress Meetings: Conduct progress meetings at a maximum of one (1) week intervals. Coordinate dates of meetings with preparation of payment requests.

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

    a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's Construction Schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule

revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.

b. Review present and future needs of each entity present, including the following:

1) Interface requirements.
2) Sequence of operations.
3) Status of submittals.
4) Deliveries.
5) Access.
6) Site utilization.
7) Temporary facilities and controls.
8) Work hours.
9) Hazards and risks.
10) Progress cleaning.
11) Quality and work standards.
12) Change Orders.
13) Documentation of information for payment requests.

3. Reporting: Contractor to distribute minutes of the meeting to each party present and to parties who should have been present. Include a brief summary, in narrative form, of progress since the previous meeting and report.

a. Schedule Updating: Revise Contractor's Construction Schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

**END OF SECTION 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. Contractor's Construction Schedule.
2. Submittals Schedule.
3. Daily construction reports.
4. Field condition reports.
5. Special reports.
6. Construction photographs.

B. Related Sections include the following:

1. Division 01 Section "Project Management and Coordination" for submitting and distributing meeting and conference minutes.
2. Division 01 Section "Submittal Procedures" for submitting schedules and reports.
3. Division 01 Section "Quality Control" for submitting a schedule of tests and inspections.
4. Division 01 Section "Closeout Procedures" for submitting photographic negatives as Project Record Documents at Project closeout.

### 1.3 SUBMITTALS

A. Submittals Schedule: Submit three copies of schedule. Arrange the following information in a tabular format:

1. Scheduled date for first submittal.
2. Specification Section number and title.
3. Submittal category (action or informational).
4. Name of subcontractor.
5. Description of the Work covered.
6. Scheduled date for Engineer's final release or approval.

B. Contractor's Construction Schedule: Submit two copies of initial schedule large enough to show entire schedule for entire construction period.

C. Field Condition Reports: Submit two copies at time of discovery of differing conditions.

D. Special Reports: Submit two copies at time of unusual event.

## 1.4 COORDINATION

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

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

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

# PART 2 - PRODUCTS

## 2.1 SUBMITTALS SCHEDULE

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

1. Coordinate Submittals Schedule with list of subcontracts, the Schedule of Values, and Contractor's Construction Schedule.

## 2.2 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

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

B. Time Frame: Extend schedule from date established for the Notice to Proceed to date of Final Completion.

1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.

C. Activities: Treat each story or separate area as a separate numbered activity for each principal element of the Work. Comply with the following:

1. Activity Duration: Define activities so no activity is longer than 20 working days, unless specifically allowed by Construction Manager.
2. Procurement Activities: Include procurement process activities for long lead items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
3. Submittal Review Time: Include review and resubmittal times indicated in Division 01 Section "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's Construction Schedule with Submittals Schedule.
4. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Construction Manager and Engineer's administrative procedures necessary for certification of Substantial Completion.

D. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.

1. Phasing: Arrange list of activities on schedule by phase.
2. Work under More Than One Contract: Include a separate activity for each contract.
3. Work Restrictions: Show the effect of the following items on the schedule:

    a. Coordination with existing construction.
    b. Limitations of continued occupancies.
    c. Uninterruptible services.
    d. Partial occupancy before Substantial Completion.
    e. Use of premises restrictions.
    f. Environmental control.

4. Area Separations: Identify each major area of construction for each major portion of the Work. Indicate where each construction activity within a major area must be sequenced or integrated with other construction activities to provide for the following:

    a. Structural completion.
    b. Substantial Completion.

E. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis to demonstrate the effect of the proposed change on the overall project schedule.

## 2.3 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 working days of date established for the Notice to Proceed. 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.

## 2.4 REPORTS

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

## 2.5 SPECIAL REPORTS

A. General: Submit special reports directly to Owner within one day of an occurrence. Distribute copies of report to parties affected by the occurrence.

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

# PART 3 - EXECUTION

## 3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

A. Contractor's Construction Schedule Updating: At weekly intervals, update schedule to reflect actual construction progress and activities. Issue schedule two working 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 Engineer, Owner, 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.

## 3.2 CONSTRUCTION PHOTOGRAPHS

A. Date Stamp: Unless otherwise indicated, date and time stamp each photograph as it is being taken so stamp is integral to photograph.

B. Preconstruction Photographs: Before starting construction, take digital color photographs of Project site and surrounding properties from different vantage points. Show existing conditions adjacent to property.

C. Periodic Construction Photographs: Take digital color photographs weekly. Photographer shall select vantage points to best show status of construction and progress since last photographs were taken.

**END OF SECTION 013200**

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# 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 miscellaneous submittals.

B. Related Sections include the following:

1. Division 01 Section "Payment Procedures."
2. Division 01 Section "Project Management and Coordination" for submitting Coordination Drawings.
3. Division 01 Section "Quality Control" for submitting test and inspection reports and Delegated-Design Submittals.
4. Division 01 Section "Closeout Procedures" for submitting warranties.

### 1.3 DEFINITIONS

A. Action Submittals: Written and graphic information that requires Engineer's responsive action.

B. Informational Submittals: Written information that does not require Engineer's approval. Submittals may be rejected for not complying with requirements.

### 1.4 SUBMITTAL PROCEDURES

A. Resubmittals: Engineer will review each of Contractor’s shop drawings and/or submittal data the initial time and, should resubmittal be required, one additional time to verify that reasons for resubmittal have been addressed by Contractor and corrections made. Resubmittal changes/revisions/corrections shall be circled. Engineer will review only circled items and will not be responsible for non-circled changes/revisions/corrections and additions. Should additional resubmittals be required, Contractor shall reimburse Owner for all costs incurred, including the cost of Engineer’s services made necessary to review such additional resubmittals. Owner will in turn reimburse Engineer.

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. Engineer 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 Engineer's receipt of submittal.

1. Initial Review: Allow 7 working days for initial review of each submittal. Allow additional time if processing must be delayed to permit coordination with subsequent submittals. Engineer will advise Contractor when a submittal being processed must be delayed for coordination.

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 5 inches on label or beside title block to record Contractor's review and approval markings and action taken by Engineer.
3. Include the following information on label for processing and recording action taken:

    a. Project name.
    b. Date.
    c. Name and address of Contractor.
    d. Name and address of subcontractor.
    e. Name and address of supplier.
    f. Name of manufacturer.
    g. Unique identifier, including revision number.
    h. Number and title of appropriate Specification Section.
    i. Drawing number and detail references, as appropriate.
    j. Other necessary identification.

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

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

1. 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. Engineer 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. Submittal and transmittal distribution record.
i. Remarks.
j. Signature of transmitter.

I. 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.

J. Use for Construction: Use only final submittals with mark indicating action taken by Engineer in connection with construction.

## PART 2 - PRODUCTS

### 2.1 ACTION SUBMITTALS

A. General: Prepare and submit Action Submittals required by individual Specification Sections either paper submittals or Digital Data Files as indicated below.

1. Number of Copies Paper Submittals: Submit three copies of each submittal, unless otherwise indicated. Engineer**,** will return two copies. Mark up and retain one returned copy as a Project Record Document.
2. Email: Prepare submittals as PDF package, and transmit to Engineer by sending via email. Include PDF transmittal form. Include information in email subject line as requested by Engineer.

a. Engineer will return annotated file. Annotate and retain one copy of file as a digital Project Record Document file.

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. Mill reports.
    g. Standard product operating and maintenance manuals.
    h. Compliance with recognized trade association standards.
    i. Compliance with recognized testing agency standards.
    j. Application of testing agency labels and seals.
    k. Notation of coordination requirements.

C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale.

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

    a. Dimensions.
    b. Identification of products.
    c. Fabrication and installation drawings.
    d. Roughing-in and setting diagrams.
    e. Shopwork manufacturing instructions.
    f. Templates and patterns.
    g. Schedules.
    h. Design calculations.
    i. Compliance with specified standards.
    j. Notation of coordination requirements.
    k. Notation of dimensions established by field measurement.

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 40 inches.
3. Number of Copies: Submit three blue- or black-line prints of each submittal, unless prints are required for operation and maintenance manuals. Submit five prints where prints are required for operation and maintenance manuals. Engineer will retain one print; remainder will be returned**.** Mark up and retain one returned print as a Project Record Drawing.

D. Coordination Drawings: Comply with requirements in Division 01 Section "Project Management and Coordination."

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

1. Comply with requirements in Division 01 Section "Quality Control" for mockups.

2. 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.
3. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from the same material to be used for the Work, cured and finished in manner specified, and physically identical with the product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
4. Preparation: Mount, display, or package Samples in manner specified to facilitate review of qualities indicated. Prepare Samples to match Engineer's sample where so indicated. Attach label on unexposed side that includes the following:

    a. Generic description of Sample.
    b. Product name or name of manufacturer.
    c. Sample source.

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

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

6. Number of Samples for Initial Selection: Submit one full set of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Engineer**,** will return submittal with options selected.
7. Number of Samples for Verification: Submit two sets of Samples. Engineer will retain one Sample set; remainder will be returned. Mark up and retain one returned Sample set as a Project Record Sample.

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

F. Submittals Schedule: Comply with requirements in Division 01 Section "Construction Progress Documentation."

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

H. Schedule of Values: Comply with requirements in Division 01 Section "Payment Procedures."

## 2.2 INFORMATIONAL SUBMITTALS

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

1. Number of Copies: Submit two copies of each submittal, unless otherwise indicated. Engineer will not return copies.
2. Certificates and Certifications: Provide a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
3. Test and Inspection Reports: Comply with requirements in Division 01 Section "Quality Control."

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

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

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

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

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

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

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

1. Preparation of substrates.
2. Required substrate tolerances.
3. Sequence of installation or erection.

4. Required installation tolerances.
5. Required adjustments.
6. Recommendations for cleaning and protection.

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

J. Construction Photographs: Comply with requirements in Division 01 Section "Construction Progress Documentation."

K. Material Safety Data Sheets: Submit information directly to Construction Manager. If submitted to Engineer, Engineer will not review this information but will return it with no action taken.

## 2.3 REQUESTS FOR INFORMATION

A. RFI process shall not be used for requesting substitutions. Procedures for substitutions are clearly specified elsewhere in the contract documents.

# PART 3 - EXECUTION

## 3.1 MATERIAL SUMMARY LETTER

A. The selected Contractor must present a letter to Troup County Purchasing Department detailing the Manufacturers of the products contractors will be using. All Manufacturers will extend the full warranty of its products.

## 3.2 CONTRACTOR'S REVIEW

A. Review each submittal and check for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Engineer.

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.

## 3.3 ENGINEER'S ACTION

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

B. Action Submittals: Engineer or its sub-consultant will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action taken, as follows:

1. Engineer's terminology on Shop Drawing review stamp of "NO EXCEPTION TAKEN" shall mean that Engineer has reviewed and approved Shop Drawing so stamped only for conformance with design concept of Project as given in Contract Documents.
2. Engineer's terminology on Shop Drawing review stamp of "MAKE CORRECTIONS NOTED – RESUBMITTAL NOT REQUIRED" shall mean that Engineer has reviewed and approved Shop Drawing so stamped, subject to corrections made on Shop Drawing, only for conformance with design concept of Project as given in Contract Documents.
3. Engineer's terminology on Shop Drawing review stamp of "REJECTED" shall mean that Engineer has not approved the Shop Drawing so stamped, subject to corrections made on Shop drawing and resubmittal is required.
4. Engineer's terminology on Shop Drawing review stamp of "REVISE AND RESUBMIT" shall mean that Engineer has reviewed and not approved Shop Drawing, only for conformance with design concept of Project as given in Contract Documents and resubmittal is required.
5. Engineer's terminology in Shop Drawing review stamp of "SUBMITTAL NOT REQUIRED NO REVIEW PERFORMED" shall mean that submittal is not required by specification or resubmittal was not required and Engineer has not reviewed the shop drawings.

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

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

**END OF SECTION 013300**

# SECTION 014000 - QUALITY CONTROL

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of 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 quality control services.

B. Testing and inspection 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 quality-control requirements for individual work results are specified in their respective Specification Sections. Requirements in individual Sections may also cover production of standard products.
2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and quality-control procedures that facilitate compliance with the Contract Document requirements.
3. Requirements for Contractor to provide quality-assurance and quality-control services required by Engineer, Owner, or authorities having jurisdiction are not limited by provisions of this Section.
4. Specific test and inspection requirements are not specified in this Section.

### 1.3 DEFINITIONS

A. Experienced: When used with an entity or individual, "experienced" unless otherwise further described means having successfully completed a minimum of five (5) previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

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

C. 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, assembly, and similar operations.

1. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade(s).

D. Mockups: Full-size physical assemblies that are constructed on-site either as freestanding temporary built elements or as part of permanent construction. Mockups are constructed to verify selections made under Sample submittals; to demonstrate aesthetic effects and qualities of materials and execution; to review coordination, testing, or operation; to show interface between dissimilar materials; and to demonstrate compliance with specified installation tolerances. Mockups are not Samples. Unless otherwise indicated, approved mockups establish the standard by which the Work will be judged.

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

F. 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.

G. 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. Contractor's quality-control services do not include contract administration activities performed by Engineer.

## 1.4 CONFLICTING REQUIREMENTS

A. Conflicting Standards and Other Requirements: If compliance with two or more standards or requirements are specified and the standards or requirements establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Engineer for direction 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 Engineer for a decision before proceeding.

## 1.5 ACTION SUBMITTALS

A. Shop Drawings: For mockups.

1. Include plans, sections, and elevations, indicating materials and size of mockup construction.
2. Indicate manufacturer and model number of individual components.
3. Provide axonometric drawings for conditions difficult to illustrate in two dimensions.

## 1.6 INFORMATIONAL SUBMITTALS

A. Contractor's Quality-Control Plan: For quality-assurance and quality-control activities and responsibilities.

B. Qualification Data: For Contractor's quality-control personnel.

C. Testing Agency Qualifications: 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.

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

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

E. Reports: Prepare and submit certified written reports and documents as specified.

F. Permits, Licenses, and Certificates: For Owner's record, 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.

## 1.7 REPORTS AND DOCUMENTS

A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:

1. Date of issue.
2. Project title and number.
3. Name, address, telephone number, and email address of testing agency.
4. Dates and locations of samples and tests or inspections.
5. Names of individuals making tests and inspections.
6. Description of the Work and test and inspection method.
7. Identification of product and Specification Section.
8. Complete test or inspection data.
9. Test and inspection results and an interpretation of test results.
10. Record of temperature and weather conditions at time of sample taking and testing and inspection.

11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
12. Name and signature of laboratory inspector.
13. Recommendations on retesting and reinspection.

B. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:

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

C. Factory-Authorized Service Representative's Reports: Prepare written information documenting manufacturer's factory-authorized service representative's tests and inspections specified in other Sections. Include the following:

1. Name, address, telephone number, and email address of factory-authorized service representative making report.
2. Statement that equipment complies with requirements.
3. Results of operational and other tests and a statement of whether observed performance complies with requirements.
4. Statement whether conditions, products, and installation will affect warranty.
5. Other required items indicated in individual Specification Sections.

## 1.8 QUALITY ASSURANCE

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

B. 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. As applicable, procure products from manufacturers able to meet qualification requirements, warranty requirements, and technical or factory-authorized service representative requirements.

C. 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.

D. Installer Qualifications: A firm or individual experienced in installing, erecting, applying, 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.

E. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspection indicated, as documented according to ASTM E 329 and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.

F. Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

## 1.9 RESPONSIBILITIES

A. Contractor Responsibilities: Perform quality-control activities, whether specified or not, to verify and document that the Work complies with requirements.

1. 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.
2. Engage a qualified testing agency to perform quality-control services.

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

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

B. Retesting/Re-inspecting: Provide quality-control services, including retesting and re-inspecting, for construction that replaced Work that failed to comply with the Contract Documents.

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

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

2. Determine the locations 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 duties of Contractor.

D. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Division 1 Section "Submittal Procedures."

E. Manufacturer's Technical Services: Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in preinstallation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.

F. Associated Contractor Services: Cooperate with agencies and representatives 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 inspection. Assist agency in obtaining samples.
4. Facilities for storage and field curing of test samples.

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

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

## 1.10 SPECIAL TESTS AND INSPECTIONS

A. Special Tests and Inspections: Conducted by a qualified **testing agency** as required by authorities having jurisdiction, as indicated in individual Specification Sections, and as follows:

1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures and reviewing the completeness and adequacy of those procedures to perform the Work.

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

## PART 2 - PRODUCTS (NOT APPLICABLE)

## PART 3 - EXECUTION

### 3.1 TEST AND INSPECTION LOG

A. Test and Inspection Log: 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 Engineer.
4. Identification of testing agency or special inspector conducting test or inspection.

### 3.2 REPAIR AND PROTECTION

A. General: On completion of testing, inspection, 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 or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Division 1 Section "Execution."

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**

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# 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 Engineer's action on Contractor's submittals, applications, and requests, "approved" is limited to Engineer's duties and responsibilities as stated in the Conditions of the Contract.

C. "Directed": A command or instruction by Engineer. 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": Unload, temporarily store, unpack, assemble, erect, place, anchor, apply, work to dimension, finish, cure, protect, clean, and similar operations at Project site.

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.

## 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's "Encyclopedia of Associations: National Organizations of the U.S." or in Columbia Books' "National Trade & Professional Associations of the United States."

B. 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. This information is believed to be accurate as of the date of the Contract Documents.

1. IAPMO - International Association of Plumbing and Mechanical Officials; www.iapmo.org.
2. ICC - International Code Council; www.iccsafe.org.
3. ICC-ES - ICC Evaluation Service, LLC; www.icc-es.org.

C. Federal Government 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. Information is subject to change and is up to date as of the date of the Contract Documents.

1. COE - Army Corps of Engineers; www.usace.army.mil.
2. CPSC - Consumer Product Safety Commission; www.cpsc.gov.
3. DOC - Department of Commerce; National Institute of Standards and Technology; www.nist.gov.
4. DOD - Department of Defense; www.quicksearch.dla.mil.
5. DOE - Department of Energy; www.energy.gov.
6. EPA - Environmental Protection Agency; www.epa.gov.
7. FAA - Federal Aviation Administration; www.faa.gov.
8. FG - Federal Government Publications; www.gpo.gov/fdsys.
9. GSA - General Services Administration; www.gsa.gov.
10. HUD - Department of Housing and Urban Development; www.hud.gov.

11. LBL - Lawrence Berkeley National Laboratory; Environmental Energy Technologies Division; www.eetd.lbl.gov.
12. OSHA - Occupational Safety & Health Administration; www.osha.gov.
13. SD - Department of State; www.state.gov.
14. TRB - Transportation Research Board; National Cooperative Highway Research Program; The National Academies; www.trb.org.
15. USDA - Department of Agriculture; Agriculture Research Service; U.S. Salinity Laboratory; www.ars.usda.gov.
16. USDA - Department of Agriculture; Rural Utilities Service; www.usda.gov.
17. USDOJ - Department of Justice; Office of Justice Programs; National Institute of Justice; www.ojp.usdoj.gov.

D. 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. This information is subject to change and is believed to be accurate as of the date of the Contract Documents.

1. CFR - Code of Federal Regulations; Available from Government Printing Office; www.gpo.gov/fdsys.
2. DOD - Department of Defense; Military Specifications and Standards; Available from DLA Document Services; www.quicksearch.dla.mil.
3. FED-STD - Federal Standard; (See FS).
4. FS - Federal Specification; Available from DLA Document Services; www.quicksearch.dla.mil.

    a. Available from Defense Standardization Program; www.dsp.dla.mil.
    b. Available from General Services Administration; www.gsa.gov.
    c. Available from National Institute of Building Sciences/Whole Building Design Guide; www.wbdg.org/ccb.

5. USAB – United States Access Board; www.access-board.gov

**PART 2 - PRODUCTS (NOT APPLICABLE)**

**PART 3 - EXECUTION (NOT APPLICABLE)**

**END OF SECTION 014200**

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# 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. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.

### 1.3 USE CHARGES

A. General: Installation and removal of and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities engaged in the Project to use temporary services and facilities without cost, including, but not limited to, Engineer, testing agencies, and authorities having jurisdiction.

B. Water and Sewer Service from Existing System: Water from Owner's existing water system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

C. Electric Power Service from Existing System: Electric power from Owner's existing system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

### 1.4 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.

C. Accessible Temporary Egress: Comply with applicable provisions in the United States Access Board's ADA-ABA Accessibility Guidelines.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

A. Portable Chain-Link Fencing: Minimum 2-inch (50-mm), 0.148-inch- (3.8-mm-) thick, galvanized-steel, chain-link fabric fencing; minimum 6 feet (1.8 m) high with galvanized-steel pipe posts; minimum 2-3/8-inch- (60-mm-) OD line posts and 2-7/8-inch- (73-mm-) OD corner and pull posts, with 1-5/8-inch- (42-mm-) OD top and bottom rails. Provide bases for supporting posts.

B. Fencing Windscreen Privacy Screen: Polyester fabric scrim with grommets for attachment to chain link fence, sized to height of fence, in color selected by Engineer from manufacturer's standard colors.

C. Polyethylene Sheet: Reinforced, fire-resistive sheet, 10-mil (0.25-mm) minimum thickness, with flame-spread rating of 15 or less per ASTM E 84 and passing NFPA 701 Test Method 2.

D. Lumber and Plywood: All wood used for safety or separation barriers between the public and the work area shall be UL labeled, fire treated.

1. For signs and directory boards, provide exterior type, Grade B-B High Density Concrete Form Overlay Plywood conforming to PS-1, of sizes and thickness indicated.
2. For fences and vision barriers, provide exterior type, minimum ½-in. thick plywood.

### 2.2 EQUIPMENT

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

## 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.

1. Locate facilities to limit site disturbance as specified in Division 1 Section "Summary."

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

1. Toilets: Use of Owner's existing toilet 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.

B. Electric Power Service: Connect to Owner's existing electric power service. Maintain equipment in a condition acceptable to Owner.

C. 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.

D. Telephone and Electronic Communication Service: Provide project superintendent with 3G/4G mobile smartphone with phone and data access at project site. Ensure connectivity (phone and data) is available at project site.

## 3.3 SUPPORT FACILITIES INSTALLATION

A. Parking: Use designated areas of Owner's existing parking areas for construction personnel.

B. Waste Disposal Facilities: Comply with requirements specified in Division 1 Section "Construction Waste Management and Disposal."

C. 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 progress cleaning requirements in Division 1 Section "Execution."

D. Existing Elevator Use: Use of Owner's existing elevators will be permitted, provided elevators are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore elevators to condition existing before initial use, including replacing worn cables, guide shoes, and similar items of limited life.

1. Do not load elevators beyond their rated weight capacity.
2. Provide protective coverings, barriers, devices, signs, or other procedures to protect elevator car and entrance doors and frame. If, despite such protection, elevators become damaged, engage elevator Installer to restore damaged work so no evidence remains of correction work. Return items that cannot be refinished in field to the shop, make required repairs and refinish entire unit, or provide new units as required.

E. Existing Stair Usage: Use of Owner's existing stairs will be permitted, provided 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 stairs become damaged, restore damaged areas so no evidence remains of correction work.

## 3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.

1. Where access to adjacent properties is required in order to affect protection of existing facilities, obtain written permission from adjacent property owner to access property for that purpose.

B. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.

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

D. 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.

E. Temporary Partitions: Provide floor-to-ceiling dustproof partitions to limit dust and dirt migration and to separate areas occupied by Owner and tenants from fumes and noise.

F. 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; manage fire-prevention program.

1. Prohibit smoking in construction areas. Comply with additional limits on smoking specified in other Sections.
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. If using fire-suppression sprinkler systems or other permanent fire-protection systems, insert specific requirements.

**END OF SECTION 015000**

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# SECTION 016000 - PRODUCT REQUIREMENTS

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of 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 governing Contractor's selection of products for use in Project.

B. Related Sections: Following Sections contain requirements that relate to this Section:

1. Division 01 Section "Product Substitution Procedures" specifies administrative procedures for handling requests for substitutions made after award of the Contract.

### 1.3 DEFINITIONS

A. Definitions used in this Article are not intended to change meaning of other terms used in Contract Documents, such as "specialties," "systems," "structure," "finishes," "accessories," and similar terms. Such terms such are self-explanatory and have well recognized meanings in construction industry.

1. **"Products"** are items purchased for incorporation in Work, whether purchased for Project or taken from previously purchased stock. Term "product" includes terms "material," "equipment," "system," and terms of similar intent.

    a. "Named Products" are items identified by manufacturer's product name, including make or model designation, indicated in manufacturer's published product literature, that is current as of date of Contract Documents.

2. **"Materials"** are products that are substantially shaped, cut, worked, mixed, finished, refined or otherwise fabricated, processed, or installed to form part of Work.
3. **"Equipment"** is a product with operational parts, whether motorized or manually operated, that requires service connections such as wiring or piping.

### 1.4 SUBMITTALS

A. Product List: Prepare list showing products specified in tabular form acceptable to Engineer. Include generic names of products required. Include manufacturer's name and proprietary product names for each item listed.

1. Coordinate product list with Contractor's Construction Schedule and Schedule of Submittals.
2. Form: Prepare product list with information on each item tabulated under following column headings:

    a. Related Specification Section number.
    b. Generic name used in 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.

3. Initial Submittal: Within 14 days after date of commencement of Work, submit one copy of an initial product list. Provide written explanation for omissions of data and for known variations from Contract requirements.

    a. At Contractor's option, initial submittal may be limited to product selections and designations that must be established early in Contract period.

4. Completed List: Within 30 days after date of commencement of Work, submit 3 copies of completed product list. Provide written explanation for omissions of data and for known variations from Contract requirements.
5. Engineer's Action: Engineer will respond in writing to Contractor within 1 wk of receipt of completed product list. No response within this period constitutes no objection to listed manufacturers or products but does not constitute a waiver of the requirement that products comply with Contract Documents. Engineer's response will include a list of unacceptable product selections, containing a brief explanation of reasons for this action.

## 1.5 QUALITY ASSURANCE

A. Source Limitations: To fullest extent possible, provide products of same kind, from single source.

1. When specified products are available only from sources that do not or cannot produce quantity adequate to complete project requirements in timely manner, consult with Engineer for determination of most important product qualities before proceeding. Qualities may include attributes relating to visual appearance, strength, durability, or compatibility. When determination has been made, select products from sources that produce products that possess these qualities, to fullest extent possible.

B. Compatibility of Options: When Contractor is given option of selecting between 2 or more products for use on Project, product selected shall be compatible with products previously selected, even if previously selected products were also options.

C. Nameplates: Except for required labels and operating data, do not attach or imprint manufacturer's or producer's nameplates or trademarks on exposed surfaces of products which will be exposed to view in occupied spaces or on exterior.

D. Labels: Locate required product labels and stamps on a concealed surface or, where required for observation after installation, on an accessible surface that is not conspicuous.

## 1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

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

1. Schedule delivery to minimize long-term storage at 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 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 upon delivery to ensure compliance with Contract Documents, and to ensure that products are undamaged and properly protected.
5. Store products at site in manner that will facilitate inspection and measurement of quantity or counting of units.
6. Store heavy materials away from Project structure in manner that will not endanger supporting construction.
7. Store products subject to damage by elements above ground, under cover in weathertight enclosure, with ventilation adequate to prevent condensation. Maintain temperature and humidity within range required by manufacturer's instructions.

# PART 2 - PRODUCTS

## 2.1 PRODUCT SELECTION

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

1. Provide products complete with all accessories, trim, finish, safety guards and other devices and details needed for complete installation and for intended use and effect.
2. Standard Products: Where available, provide standard products of types that have been produced and used successfully in similar situations on other projects.

B. Product Selection Procedures: Product selection is governed by Contract Documents and governing regulations, not by previous Project experience. Procedures governing product selection include following:

1. Proprietary Specification Requirements: Where only a single product or manufacturer is named, provide product indicated. No substitutions will be permitted.
2. Semi Proprietary Specification Requirements: Where 2 or more products or manufacturers are named, provide 1 of products indicated. No substitutions will be permitted.

    a. Where products or manufacturers are specified by name, accompanied by term "or equal," or "or approved equal" comply with Contract Document provisions concerning "substitutions" to obtain approval for use of an unnamed product.

3. Compliance with Standards, Codes and Regulations: Where Specifications only require compliance with an imposed code, standard or regulation, select product that complies with standards, codes or regulations specified.
4. Visual Matching: Where Specifications require matching an established Sample, Engineer's decision will be final on whether proposed product matches satisfactorily.

    a. Where no product available within specified category matches satisfactorily and complies with other specified requirements, comply with provisions of Contract Documents concerning "substitutions" for selection of matching product in another product category.

5. Visual Selection: Where specified product requirements include phrase "...as selected from manufacturer's standard colors, patterns, textures..." or similar phrase, select product and manufacturer that complies with other specified requirements. Engineer will select color, pattern and texture from product line selected.

## PART 3 - EXECUTION

### 3.1 INSTALLATION OF PRODUCTS:

A. Comply with manufacturer's instructions and recommendations for installation of products in applications indicated. Anchor each product securely in place, accurately located and aligned with other Work.

1. Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

**END OF SECTION 016000**

# SECTION 016010 - PRODUCT SUBSTITUTION PROCEDURES

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of 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 requests for substitutions made after award of Contract.

B. Procedural requirements governing Contractor's selection of products and product options are included under Section "Product Requirements."

C. Engineer's policy is to reject requests for substitution unless paragraph "Substitutions" under Article "Definitions" applies. Vendors wishing inclusion in Engineer's master specification: contact Engineer for procedure.

### 1.3 DEFINITIONS

A. Definitions used in this Article are not intended to change or modify meaning of other terms used in Contract Documents.

B. Substitutions: Requests for changes in products, materials, equipment, and methods of construction required by Contract Documents proposed by Contractor after award of Contract are considered requests for "substitutions." Following are not considered substitutions:

1. Revisions to Contract Documents requested by Owner or Engineer.
2. Specified options of products and construction methods included in Contract Documents.
3. Contractor's determination of and compliance with governing regulations and orders issued by governing authorities.

### 1.4 SUBMITTALS

A. Substitution Request Submittal: Requests for substitution will be considered if received within 15 days after commencement of Work. Requests received more 15 days after commencement of Work may be considered or rejected at discretion of Engineer.

1. Submit 3 copies of each request for substitution for consideration. Submit requests on forms included at end of this Section and in accordance with procedures required for Change Order proposals.
2. Identify product, or fabrication or installation method to be replaced in each request. Include related Specification Section and Drawing numbers. Provide complete documentation showing compliance with requirements for substitutions, and the following information, as appropriate:

    a. Product Data, including Drawings and descriptions of products, fabrication and installation procedures.
    b. Samples, where applicable or requested.
    c. Detailed comparison of significant qualities of proposed substitution with those of Work specified. Significant qualities may include elements such as size, weight, durability, performance and visual effect.
    d. Coordination information, including list of changes or modifications needed to other parts of Work and to construction performed by Owner and separate Contractors, that will become necessary to accommodate proposed substitution.
    e. Statement indicating substitution's effect on Contractor's Construction Schedule compared to schedule without approval of substitution. Indicate effect of proposed substitution on overall Contract Time.
    f. Cost information, including proposal of net change, if any in Contract Sum.
    g. Certification by Contractor that substitution proposed is equal-to or better in every significant respect to that required by Contract Documents, and that it will perform adequately in application indicated. Include Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of substitution to perform adequately.

## PART 2 - PRODUCTS

### 2.1 SUBSTITUTIONS

A. Conditions: Contractor's substitution request, except where specifically denied in the specifications will be received and considered by Engineer when one or more of following conditions are satisfied, as determined by Engineer; otherwise requests will be returned without action except to record noncompliance with these requirements.

1. Extensive revisions to Contract Documents are not required.
2. Proposed changes are in keeping with general intent of Contract Documents.
3. Request is timely, fully documented and properly submitted.
4. Request is directly related to an "or equal" clause or similar language in Contract Documents.
5. Specified product or method of construction cannot be provided within Contract Time. Request will not be considered if product or method cannot be provided as result of failure to pursue Work promptly or coordinate activities properly.
6. Substantial advantage is offered the Owner, in terms of cost, time, energy conservation or other considerations of merit, after deducting offsetting responsibilities Owner may be required to bear. Additional responsibilities for

Owner may include additional compensation to Engineer for redesign and evaluation services, increased cost of other construction by Owner or separate Contractors, and similar considerations.

7. Specified product or method of construction cannot be provided in manner that is compatible with other materials, and where Contractor certifies that substitution will overcome incompatibility.
8. Specified product or method of construction cannot be coordinated with other materials, and where Contractor certifies that proposed substitution can be coordinated.
9. Specified product or method of construction cannot provide warranty required by Contract Documents and where Contractor certifies that proposed substitution provide required warranty.

B. Contractor's submittal and Engineer's acceptance of Shop Drawings, Product Data or Samples that relate to construction activities not complying with Contract Documents does not constitute an acceptable or valid request for substitution, nor does it constitute approval.

**PART 3 - EXECUTION (NOT APPLICABLE)**

**END OF SECTION 016010**

## REQUEST FOR SUBSTITUTION

To:

Attention:

From: _____
Name of Company

_____
Address

_____
City, State, Zip Code

_____
Phone

Fully answer all information requested below. Failure to answer any item may cause rejection of request for substitution. If requested by Engineer, submit information about manufacturer and vendor history, financial stability, distribution and support systems. Use one form for each product requested. Only first product listed will be considered on forms with more than one product listed.

Specification Section Number: _____ Drawing Number: _____

Para Number: _____ Detail Number: _____

Specified Product: _____

Proposed Substitution: _____

Answer the following questions. Attach an explanation sheet on your company's letterhead when required.

Does the proposed substitution affect dimensions indicated on Drawings?

No _____ Yes _____ (If yes, explain below).

_____

_____

_____

Does the proposed substitution require changes in Drawings and/or design or installation changes?

No _____ Yes _____

If yes, is the cost of these changes included in the proposed amount? No ____ Yes _____

Does the proposed substitution affect other trades? No _____ Yes _____

(If yes, explain who and how)

_____

_____

_____

If the proposed product does affect the work of other trades, has the cost impact on their work been included in the price of the proposed substitution?

No _____ Yes _____

Does the proposed product's guarantee differ from that of the specified product's?

No _____ Yes _____ (If yes, explain below).

_____

_____

_____

Why is this proposal for substitution being submitted? List reasons below.

_____

_____

_____

Attach a listing of 3 projects using proposed substitution completed within the past 5 yrs in geographic and climatic region of Project. One of applications shall have been in service for at least 3 yrs.

Attach product data/brochures and Vendor Qualification Form for the specified and substitute product.

Undersigned has examined Construction Documents, is familiar with specified product, understands indicated application of product, and understands design intent of Engineer. Undersigned states that proposed substitution complies with Construction Documents and will perform at least equally to specified product within limitations stated above. Undersigned accepts responsibility for coordinating application and installation of proposed substitution and waives all claims for additional costs resulting from incorporation of proposed substitution into Project or its subsequent failure to perform according to specified requirements.

Submitted By: _____ _____
Typed Signature

Date: _____

# 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.
9. Construction Phasing.
10. Maintaining public access through or adjacent to 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.
5. Division 02 Section “Work Items” for coordinating restoration construction activities to maintain Owner’s operations during construction.

## PART 2 - PRODUCTS (NOT APPLICABLE)

## 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 demolition, investigate and verify the existence and location of underground or embedded utilities and other construction affecting the Work.

1. 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 Owner that is necessary to adjust, move, or relocate existing utility lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.

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 two business days in advance of proposed utility interruptions.
2. Do not proceed with utility interruptions without Owner's written permission.

C. 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.

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

E. 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 Engineer. Include a detailed description of problem encountered, together with recommendations for changing the Contract Documents.

## 3.3 CONSTRUCTION LAYOUT

A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings. If discrepancies are discovered, notify Engineer promptly.

## 3.4 INSTALLATION

A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.

1. Make vertical work plumb and make horizontal work level.
2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
3. Conceal pipes, ducts, and wiring in finished areas, unless otherwise indicated.
4. Maintain minimum headroom clearance in spaces without a suspended ceiling.

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. 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 Engineer.
2. Allow for building movement, including thermal expansion and contraction.

G. 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.

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

## 3.5 PROGRESS CLEANING

A. General: Clean Project site and work areas daily, including common areas. Coordinate progress cleaning for joint-use areas where more than one installer has worked. Enforce requirements strictly. Dispose of materials lawfully.

1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
2. 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: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

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

1. Thoroughly clean piping, conduit, and similar features before applying paint or other finishing materials. Restore damaged pipe covering to its original condition.

H. 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.

I. 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.

J. 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.

K. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

## 3.6 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.

## 3.7 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 017423 - FINAL CLEANING

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 SUMMARY

A. This Section specifies administrative and procedural requirements for final cleaning at Substantial Completion.

1. Special cleaning requirements for specific elements of Work are included in appropriate specification sections.

B. General Project closeout requirements are included in Section "Closeout Procedures."

C. Environmental Requirements: Conduct cleaning and waste disposal operations in compliance with local laws and ordinances. Comply fully with federal and local environmental and anti-pollution regulations.

1. Do not dispose of volatile wastes such as mineral spirits, oil or paint thinner in storm or sanitary drains.
2. Burning or burying of debris, rubbish or other waste material on the premises will not be permitted.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

A. Cleaning Agents: Use cleaning materials and agents recommended by the manufacturer or fabricator of 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 operations when indicated. Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit of Work to the condition expected from commercial building cleaning and maintenance program. Comply with manufacturer's instructions.

B. Complete following cleaning operations before requesting inspection for Certification of Substantial Completion for entire Project or a portion of Project.

1. Clean Project site, yard and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste materials, litter and foreign substances. Sweep paved areas broom clean. Remove petro-chemical spills, stains and other foreign deposits. Rake grounds that are neither planted nor paved, to a smooth even-textured surface.
2. Remove tools, construction equipment, machinery and surplus material from the site.
3. 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.
4. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics and similar spaces.
5. Broom clean concrete floors in unoccupied spaces.
6. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other substances that are noticeable vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.
7. Remove labels that are not permanent labels.
8. Touch-up and otherwise repair and restore marred exposed finishes and surfaces. Replace finishes and surfaces that can not be satisfactorily repaired or restored, or that show evidence of repair or restoration. Do not paint over "UL" and similar labels, including mechanical and electrical name plates.
9. Wipe surfaces of mechanical and electrical equipment, elevator equipment and similar equipment. Remove excess lubrication, paint and mortar droppings and other foreign substances.
10. Clean light fixtures, lamps, globes and reflectors to function with full efficiency. Replace burned out bulbs, and defective and noisy starters in fluorescent and mercury vapor fixtures.
11. Leave Project clean and ready for occupancy.

C. Removal of Protection: Remove temporary protection and facilities installed during construction to protect previously completed installations during remainder of construction period.

D. Compliances: Comply with governing regulations and safety standards for cleaning operations. Remove waste materials from the site and dispose of in a lawful manner.

1. Where extra materials of value remain after completion of associated construction have become Owner's property, dispose of these materials as directed.

**END OF SECTION 017423**

# SECTION 017700 - CLOSEOUT PROCEDURES

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 SUMMARY

A. This Section specifies administrative and procedural requirements for project closeout, including but not limited to:

1. Inspection procedures.
2. Submittal of warranties.
3. Final cleaning.

B. Closeout requirements for specific construction activities are included in appropriate specification sections.

### 1.3 SUBSTANTIAL COMPLETION

A. Preliminary Procedures: Before requesting inspection for certification of Substantial Completion, complete following. List exceptions in request.

1. In Application for Payment that coincides with, or first follows, date Substantial Completion is claimed, show 100% completion for portion of Work claimed as substantially complete. Include supporting documentation for completion as indicated in these Contract Documents and statement showing an accounting of changes to Contract Sum.

    a. If 100% completion cannot be shown, include list of incomplete items, value of incomplete construction, and reasons Work is not complete.

2. Advise Owner of pending insurance change-over requirements.
3. Submit specific warranties, workmanship bonds, maintenance agreements, final certifications and similar documents.
4. Obtain and submit releases enabling Owner unrestricted use of Work and access to services and utilities; include occupancy permits, operating certificates and similar releases.
5. Complete final clean up requirements, including touch-up painting. Touch-up and otherwise repair and restore marred exposed finishes.

B. Inspection Procedures: On receipt of request for inspection, Engineer will either proceed with inspection or advise Contractor of unfilled requirements. Engineer will prepare Certificate of Substantial Completion following inspection, or advise Contractor of construction that must be completed or corrected before certificate will be issued.

1. Engineer will repeat inspection when requested and assured that Work has been substantially completed.
2. Engineer will provide one repeat inspection under its contract with Owner. Subsequent inspections shall be at Contractor's expense.
3. Results of completed inspection will form basis of requirements for final acceptance.

## 1.4 FINAL ACCEPTANCE

A. Preliminary Procedures: Before requesting final inspection for certification of final acceptance and final payment, complete the following. List exceptions in request.

1. Submit final payment request with releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations where required.
2. Submit an updated final statement, accounting for final additional changes to Contract Sum.
3. Submit certified copy of Engineer's final inspection list of items to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance, and list has been endorsed and dated by Engineer.
4. Submit evidence of final, continuing insurance coverage complying with insurance requirements.

B. Reinspection Procedure: Engineer will reinspect Work upon receipt of notice that Work, including inspection list items from earlier inspections, has been completed, except items whose completion has been delayed because of circumstances acceptable to Engineer.

1. Engineer will provide one repeat inspection under its contract with Owner. Subsequent inspections shall be at Contractor's expense.
2. Upon completion of reinspection, Engineer will prepare certificate of final acceptance, or advise Contractor of Work that is incomplete or of obligations that have not been fulfilled but are required for final acceptance.
3. If necessary, reinspection will be repeated.

## PART 2 - PRODUCTS (NOT APPLICABLE).

## PART 3 - EXECUTION (NOT APPLICABLE).

## END OF SECTION 017700

# SECTION 017836 - WARRANTIES

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 SUMMARY

A. This Section includes administrative and procedural requirements for warranties required by Contract Documents, including manufacturers standard warranties on products and special warranties.

1. Refer to General Conditions for terms of Contractor's period for correction of Work.

B. Related Sections: Following Sections contain requirements that relate to this Section:

1. Division 1 Section "Submittal Procedures" specifies procedures for submitting warranties.
2. Division 1 Section "Closeout Procedures" specifies contract closeout procedures.
3. Divisions 2 through 16 Sections for specific requirements for warranties on products and installations specified to be warranted.
4. Certifications and other commitments and agreements for continuing services to Owner are specified elsewhere in Contract Documents.

C. Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of warranty on Work that incorporates products. Manufacturer's disclaimers and limitations on product warranties do not relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with the Contractor.

### 1.3 DEFINITIONS

A. Standard Product Warranties are preprinted written warranties published by individual manufacturers for particular products and are specifically endorsed by manufacturer to Owner.

B. Special warranties are written warranties required by or incorporated in the Contract Documents, either to extend time limits provided by standard warranties or to provide greater rights for the Owner.

## 1.4 WARRANTY REQUIREMENTS

A. Related Damages and Losses: When correcting failed or damaged warranted construction, remove and replace construction that has been damaged as result of such failure or must be removed and replaced to provide access for correction of warranted construction.

B. Reinstatement of Warranty: When Work covered by warranty has failed and been corrected by replacement or rebuilding, reinstate warranty by written endorsement. Reinstated warranty shall be equal to original warranty with equitable adjustment for depreciation.

C. Replacement Cost: Upon determination that Work covered by warranty has failed replace or rebuild Work to an acceptable condition complying with requirements of Contract Documents. Contractor is responsible for cost of replacing or rebuilding defective Work regardless of whether Owner has benefited from use of Work through portion of its anticipated useful service life.

D. Owner's Recourse: Expressed warranties made to Owner are in addition to implied warranties, and shall not limit duties, obligations, rights and remedies otherwise available under law. Expressed warranty periods shall not be interpreted as limitations on the time in which the Owner can enforce such other duties, obligations, rights, or remedies.

1. Rejection of Warranties: Owner reserves right to reject warranties and to limit selection to products with warranties not in conflict with requirements of Contract Documents.

E. Where Contract Documents require a special warranty, or similar commitment on Work or part of Work, Owner reserves the right to refuse to accept Work, until Contractor presents evidence that entities required to countersign such commitments are willing to do so.

## 1.5 SUBMITTALS

A. Submit written warranties to Engineer prior to date certified for Substantial Completion. If Engineer's Certificate of Substantial Completion designates commencement date for warranties other than date of Substantial Completion for Work, or designated portion of Work, submit written warranties upon request of Engineer.

B. When designated portion of Work is completed and occupied or used by Owner, by separate agreement with Contractor during construction period, submit properly executed warranties to Engineer within 15 days of completion of that designated portion of Work.

1. When Contract Documents require Contractor, or Contractor and subcontractor, supplier or manufacturer to execute a special warranty, prepare written document that contains appropriate terms and identification, ready for execution by required

parties. Submit draft to Owner through Engineer/Architect for approval prior to final execution.

C. Prepare written document utilizing appropriate form, ready for execution by Contractor, or by Contractor and subcontractor, supplier or manufacturer. Submit draft to Owner through Engineer for approval prior to final execution.

1. Refer to Divisions 2 through 9 Sections for specific content requirements and particular requirements for submittal of special warranties

D. Form of Submittal: At Final Completion compile 2 copies of each required warranty properly executed by Contractor, or by Contractor, subcontractor, supplier, or manufacturer. Organize warranty documents into an orderly sequence based on table of contents of Project Manual.

**PART 2 - PRODUCTS (NOT APPLICABLE)**

**PART 3 - EXECUTION (NOT APPLICABLE)**

**END OF SECTION 017836**

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

1. Record Drawings and Work Item Unit Quantity Drawings.
2. Record Specifications.

B. Related Requirements:

1. Section "Closeout Procedures" for general closeout procedures.
2. Divisions 02 through 05, 07, 09-10, 22, and 26 Sections for specific requirements for Project Record Documents of products in those Sections.

### 1.3 CLOSEOUT SUBMITTALS

A. Record Drawings: Comply with the following:

1. Number of Copies: Submit copies of Record Drawings as follows:

a. Initial Submittal:

1) Submit PDF electronic files of scanned record prints.
2) Engineer will indicate whether general scope of changes, additional information recorded, and quality of drafting are acceptable.

b. Final Submittal:

1) Submit PDF electronic files of scanned record prints.

B. Record Specifications: Submit annotated PDF electronic files of Project's Specifications, including addenda and contract modifications.

## 1.4 RECORD DRAWINGS

A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued.

1. Preparation: Mark record prints to show the actual installation and unit quantity 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 provide information for preparation of corresponding 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 acceptable drawing technique.
    c. Record data as soon as possible after obtaining it.
    d. Record and check the markup before enclosing concealed installations.
    e. Cross-reference record prints to corresponding photographic documentation.

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. Changes made by Change Order or Construction Change Directive.
    d. Changes made following Engineer's written orders.
    e. Details not on the original Contract Drawings.
    f. Field records for variable and concealed conditions.
    g. Record information on the Work that is shown only schematically.
    h. Actual location and quantity of unit price items of the Work.

3. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
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. Format: Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.

1. Format: Annotated PDF electronic file with comment function enabled.
2. Record Digital Data Files: Organize digital data information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each digital data file.
3. Identification: As follows:

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

## 1.5 RECORD SPECIFICATIONS

A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
4. Note related Change Orders, Record Drawings, and record Drawings where applicable.

B. Format: Submit record Specifications as annotated PDF electronic file.

## 1.6 MAINTENANCE OF RECORD DOCUMENTS

A. 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 Engineer's reference during normal working hours.

## PART 2 - PRODUCTS (NOT APPLICABLE)

## PART 3 - EXECUTION (NOT APPLICABLE)

## END OF SECTION 017839

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# SECTION 020010 - WORK ITEMS

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

## PART 2 - PRODUCTS (NOT APPLICABLE)

## PART 3 - EXECUTION

### WI 1.0 GENERAL REQUIREMENTS

A. Scope of Work

1. Work consists of performing all tasks, specifically required and incidental, which are not identified under separate Work Item designation, but necessary to perform the work identified in this project. This work includes, but is not limited to the following items:

   WI 1.1 – Project Mobilization
   WI 1.3 – Concrete Shores and Reshores
   WI 1.4 – Concrete Reinforcement
   WI 1.5 – Temporary Signage
   WI 1.7 – Owner's Contingency

### WI 1.1 PROJECT MOBILIZATION

A. Scope of Work

1. Work consists of coordinating, scheduling, obtaining and assembling at construction site all equipment, materials, permits, supplies, manpower and other essentials and incidentals necessary to perform Work defined in this Contract. Payment of lump sum amount for mobilization shall be according to following schedule and shall be based on percentage of original contract amount earned.

B. Materials

1. None

C. Execution

1. At execution of agreement by all parties, payment of not more than 25% of mobilization lump sum amount.
2. When amount earned is greater than 10% but less than 25% of original contract amount, an additional amount will be paid to bring total payment for mobilization to 50% of mobilization lump sum amount.
3. When amount earned is equal to or greater than 25% but less than 50% of original contract amount, an additional amount will be paid to bring total payment for mobilization to 75% of mobilization lump sum amount.
4. When amount earned is equal to or greater than 50% of original contract amount, an additional amount will be paid to bring total payment for mobilization to 100% of mobilization lump sum amount.

## WI 1.3 CONCRETE SHORES AND RESHORES

A. Scope of Work

1. Work consists of furnishing all labor, materials, equipment, supervision, and incidentals necessary to install temporary shoring and to maintain shores in place until restoration Work requiring shores and associated concrete has properly cured.

B. Materials

1. Shores shall be steel, rated at a minimum allowable load of 4,500 lb at 12 ft extension or steel shoring towers rated at a minimum allowable load of 40,000 lbs per four leg tower (based on two 20,000 lb crossed braced frames.).

C. Execution

1. Comply with ACI 301 and ACI 347 for shoring and reshoring in multi-story construction, except as modified in this Section.
2. For purpose of calculations: Construction Load = 50 psf; Dead Load = 100 psf for the floor slab plus the dead load of beams and girders.
3. Shore/Reshore loads on the structure shall not exceed 40 psf distributed load on the precast double tees, and concentrated loads shall not exceed posted wheel loads or 2,000 lbs., whichever is less. Concentrated bearing pressures shall not exceed 1,200 psi.
4. Shore/Reshore loads on concrete slab-on-grade shall be distributed by steel grillage or timber grillage so as not to exceed soil bearing capacity or 1,500 psf, whichever is smaller.
5. Shore/Reshore loads shall be distributed horizontally and/or distributed to more than one level to meet shore/reshore load limitations.
6. Shore/Reshore loads shall be distributed to multiple framing members (double tee stems) and extend beyond the immediate work area to ensure proper distribution of loads throughout the structure.
7. Prior to installation of shores, Contractor shall submit shoring scheme prepared and sealed by Registered Professional Engineer in Georgia.

8. Engineer/Architect will review shoring scheme for general conformance to requirements stated herein. If it does not conform, Contractor will be informed to resubmit another shoring scheme.
9. Remove shores and reshore in planned sequence to avoid damage to partially cured concrete. Locate and provide adequate reshoring to safely support Work without excessive stress or deflection.
10. Keep reshores in place as required until heavy loads due to construction operations have been removed.
11. If during construction, modifications are necessary to accommodate other trades, revise and resubmit erection plan to Engineer/Architect for review.

## WI 1.4 CONCRETE REINFORCEMENT

A. Scope of Work

1. Work consists of furnishing all labor, materials, equipment, supervision, and incidentals necessary to fabricate and install all mild steel reinforcement. This work item is incidental to WI 1.1 “Project Mobilization”.

B. Materials

1. Reinforcement materials shall be as specified in ACI 301 “Standard Specifications for Structural Concrete.”
2. Welded wire reinforcement: provide mats only. Roll stock prohibited.
3. Epoxy Coating for Existing Exposed Non-prestressed Steel Reinforcement or Welded wire reinforcement:

    a. “Sikadur 32 Hi-Mod,” Sika Chemical Corp., Lyndhurst, NJ.
    b. “Concressive Liquid LPL,” Degussa Construction Systems Americas, Shakopee, MN.
    c. “Scotchkote 413 PC,” 3M Company.
    d. “Armatec 100,” Sika Corporation.
    e. “Euco 452,” The Euclid Chemical Company, Cleveland, OH.
    f. “Resi-Bond (J-58),” Dayton Superior Corporation, OH.

C. Execution

1. Work shall conform to requirements of ACI 301 “Standard Specifications for Structural Concrete,” ACI 315-80 “Details and Detailing of Concrete Reinforcement,” ACI 318 “Building Code Requirements for Reinforced Concrete,” and Concrete Reinforcing Steel Institute (CRSI), “Manual of Standard Practice.”
2. Submittals required include: Product data for proprietary materials and items, including reinforcement and forming accessories, admixtures, patching compounds, and others as requested by Engineer/Architect including, but not limited to:

    a. Manufacturer's product data and installation instructions for proprietary form coatings, manufactured form systems, ties, and accessories.
    b. Steel producer's certificates of mill analysis, tensile tests, and bend tests.

c. Manufacturer's product data, specifications, and installation instructions for proprietary materials, welded and mechanical splices, and reinforcement accessories.

3. Store concrete reinforcement materials at site to prevent damage and accumulation of dirt or excessive rust.
4. Reinforcement with any of following defects will be rejected:

   a. Lengths, depths, and bends exceeding CRSI fabrication tolerances.
   b. Bends or kinks not indicated on Drawings or final Shop Drawings.
   c. Reduced cross-section due to excessive rusting or other cause.

5. General: Comply with Concrete Reinforcing Steel Institute's recommended practice for "Placing Reinforcing Bars," for details and methods of reinforcement placement and supports and as herein specified.

   a. Avoiding cutting or puncturing vapor retarder during reinforcement placement and concreting operations.
   b. Examine conditions under which concrete reinforcement is to be placed, and immediately notify Engineer/Architect in writing of unsatisfactory conditions. Do not proceed with Work until unsatisfactory conditions have been corrected in acceptable manner.
   c. Clean reinforcement of loose rust and mill scale, earth, and other materials that reduce or destroy bond with concrete.
   d. Fabricate reinforcement to conform to required shapes and dimensions, with fabrication tolerances complying with CRSI MSP. In case of fabricating errors, do not re-bend or straighten reinforcement in manner that will injure or weaken material.
   e. Bends in reinforcement are standard 90° bends unless noted otherwise.
   f. Reinforcement with any of following defects will be rejected:

      1) Lengths, depths, and bends exceeding CRSI fabrication tolerances.
      2) Bends or kinks not indicated on Drawings or final Shop Drawings.
      3) Reduced cross-section due to excessive rusting or other cause.

   g. Perform all welding of mild steel reinforcement, metal inserts and connections with low hydrogen welding electrodes in accordance with AWS D1.4.
   h. Comply with ACI 301, Chapter 3 for placing reinforcement.
   i. Use rebar chairs and accessories to hold all reinforcing positively in place. Provide rebar chairs at all formed surfaces, both vertical and horizontal, to maintain minimum specified cover. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces. Maximum spacing of chairs and accessories shall be per CRSI Manual of Standard Practice. In situations not covered by CRSI, provide support at 4 ft on center maximum each way.
   j. Install welded wire reinforcement in as long lengths as practicable. Lap adjoining pieces at least one full mesh and lace splices with wire. Offset laps of adjoining widths to prevent continuous laps in either direction.
   k. Splices:

1) Provide standard reinforcement splices by lapping ends, placing bars in contact, and tying tightly with wire. Comply with requirements of ACI 318 for minimum lap of spliced bars.
2) For mechanical tension splices of reinforcement:

    a) Exercise care to assure that no reduction of cross-sectional area of reinforcement occurs.
    b) Use Barsplice Products, Inc., Bar-Grip or Grip-Twist, NMB Splice Sleeve, or Erico LENTON splices.
    c) For all mechanical splices, perform splicing in strict accordance with manufacturer's requirements and instructions.
    d) All splices to develop 125% of specified yield strength of bars, or of smaller bar in transition splices.
    e) Stagger splices in adjacent bars.
    f) Except where shown on Drawings, welding of reinforcement prohibited without prior written authorization by Engineer/Architect.

3) Compression splices: Mechanically coupled splices in accordance with ACI 318, Chapter 12.

## WI 1.5 TEMPORARY SIGNAGE

A. Scope of Work

1. Work consists of furnishing all labor, materials, equipment, and supervision necessary to provide and install and remove following completion of project, temporary signage as required for traffic control and user information during construction and as required by Owner/Engineer. This work item is incidental to WI1.1 “Project Mobilization”.

B. Materials

1. Temporary signage shall meet following minimum requirements:

    a. Minimum size: 12 inches deep by 48 inches horizontal.
    b. Backing material: 0.5 in. medium density overlay plywood.
    c. Colors:

        1) Background: medium orange or white.
        2) Symbols/Lettering: black

    d. Lettering: silk screened or die-cut.

        1) Font Style: Helvetica or similar.
        2) Size: 2 in. high minimum for pedestrian information; 4 in. high minimum for traffic information.

C. Execution

1. Mounting height: 5 ft. to bottom of sign. Provide mounting brackets as required.

2. Typical regulatory signs (that is, STOP, YIELD, etc.) and "Handicap" signs shall conform to all Federal, state, and local requirements for sizes, materials, and colors.

## WI 1.7 OWNER'S CONTINGENCY

A. Scope of Work

1. Work consists of furnishing all labor, materials, equipment, supervision, and incidentals necessary to perform miscellaneous project work not covered by existing Work Items as directed in writing by the Engineer or Owner.

B. Materials/Equipment (Not Applicable)

C. Execution

1. Special conditions, hidden conditions, and similar situations shall be brought to the attention of the Owner and Engineer.
2. Where above conditions warrant, or if Owner elects to add or delete work, contract modifications will be made in accordance with Division 00 Section "Supplementary Conditions," Articles 1.14 "Work Item General," and /or 1.15 "Construction Change Directives." Contractor shall not bill, charge, invoice or in any other manner request payment against this Work Item unless specifically directed to do so by Owner/Engineer as indicated above.

## WI 3.0 CONCRETE FLOOR REPAIR

A. Scope of Work

1. This Work consists of furnishing all labor, materials, equipment, supervision, and incidentals including shoring necessary to locate existing spalls, locate and remove delaminated and unsound floor concrete, prepare cavities and install new concrete and reinforcing (as required) materials to restore concrete floor to original condition and appearance. Refer to Detail Series 3.0 for specific requirements.

B. Materials

1. Concrete repair materials shall be as specified in Section "Prepackaged Repair Mortar."

C. Execution

1. Locating, marking, removal, preparation, and inspection of deteriorated concrete and reinforcing steel preparation, repair and installation shall be performed as specified in Division 02 Section "Surface Preparation for Patching and Overlay."
2. Final surface preparation, concrete placement, finishing and curing shall be performed as specified in concrete repair material specification. Manufacturer specifications/requirements for these issues shall also be followed in the event proprietary bag mix repair materials are used.

## WI 3.1 FLOOR REPAIR - PARTIAL DEPTH

A. Refer to Work Item "Concrete Floor Repair" for scope of Work, materials and procedure associated with this Work Item. Refer to Detail 3.1 for specific requirements.

## WI 3.4 FLOOR REPAIR – CURBS/WALKS

A. Refer to Work Item 3.0, “Concrete Floor Repair” for Scope of Work, Material and Execution procedures associated with this Work Item. Refer to Detail 3.4 for specific requirements.

## WI 3.11 FLOOR REPAIR – SLAB-ON-GRADE

A. Scope of Work

1. Work consists of furnishing all labor, materials, equipment. Supervision and incidentals necessary to locate and remove delaminated slab-on-grade concrete, re-establish subbase material, and install new concrete. Refer to Detail 3.11 for specific requirements.

B. Materials

1. Concrete repair materials shall be as specified in Division 03 Section "Cast-in-Place Concrete”, Division 03 Section “Cast-in-Place Concrete – Restoration”, and/or Division 03 Section “Cast-in-Place Repair Mortar."
2. Conventional steel reinforcement shall be as specified in Division 03 Section “Cast-in-Place Concrete”, Division 03 Section “Cast-in-Place Concrete Restoration” and/or Work Item 1.4, “Concrete Reinforcement.”

C. Execution

1. Locating, marking, removal, preparation, and inspection of deteriorated floor surface concrete and reinforcing steel preparation, repair and installation shall be performed as specified in Division 02 Section "Surface Preparation for Patching and Overlay."
2. Properly compact subbase as required. Provide new subbase material, as necessary.

3. Final surface preparation, concrete placement, finishing and curing shall be performed as specified in concrete repair material specification. Manufacturer specifications/requirements for these issues shall also be followed in the event proprietary bag mix repair materials are used.

## WI 3.12 FLOOR REPAIR – SPALLED CONSTRUCTION JOINT AT SLAB ON GRADE

A. Scope of Work

1. Work consists of furnishing all labor, materials, equipment. Supervision and incidentals necessary to locate and remove spalled concrete at the slab-on-grade concrete construction joint. Refer to Detail 3.12 for specific requirements.

B. Materials

1. Materials approved materials for use in this Work are specified in Section "Concrete Joint Sealants."

C. Execution

1. Refer to detail 3.12.

## WI 4.0 CONCRETE CEILING REPAIR

A. Scope of Work

1. This Work consists of furnishing all labor, materials, equipment, supervision, and incidentals including shoring necessary to locate existing spalls, locate and remove delaminated and unsound overhead concrete, prepare cavities and install new concrete and reinforcing (as required) materials to restore overhead concrete to original condition and appearance. Refer to Detail Series 4.0 for specific requirements.

B. Materials

1. Trowel applied patching material shall be as specified in Section "Prepackaged Repair Mortar." This material may be used for shallow removal and repair Work Items only.

C. Execution

1. Locating, marking, removal, preparation, and inspection of deteriorated concrete and reinforcing steel preparation, repair and installation shall be performed as specified in Division 02 Section "Surface Preparation for Patching and Overlay."
2. Final surface preparation, concrete placement, finishing and curing shall be performed as specified in concrete repair material specification. Manufacturer specifications/requirements on these issues shall also be followed in the event proprietary bag mix repair materials are used.

## WI 4.1 CEILING REPAIR - PARTIAL DEPTH

A. Refer to Work Item 4.0, "Concrete Ceiling Repair" for Scope of Work, materials and procedure associated with this Work Item. Refer to Detail 4.1 for specific requirements.

## WI 6.0 CONCRETE COLUMN REPAIR

A. Scope of Work

1. Work consists of furnishing all labor, materials, equipment, supervision, and incidentals including shoring necessary to locate existing spalls, locate and remove delaminated and unsound concrete, prepare cavities and install concrete and reinforcing (as required) materials to restore concrete columns to original condition and appearance. Refer to Detail Series 6.0 for specific requirements.

B. Materials

1. Cast-in-place concrete repair materials shall be as specified in Division 03 Section “Prepackaged Repair Mortar.”
2. Conventional steel reinforcement shall be as specified in Work Item 1.4, “Concrete Reinforcement.”
3. Trowel applied patching material shall be as specified in Division 03 Section "Prepackaged Repair Mortar." This material may be used for shallow removal and repair Work Items only.

C. Execution

1. Locating, marking, removal, preparation, and inspection of deteriorated concrete and reinforcing steel preparation, repair and installation shall be performed as specified in Division 02 Section "Surface Preparation for Patching and Overlay .” Install shoring at repair locations where required per the Construction Documents prior to starting removals.
2. Final surface preparation, concrete placement, finishing and curing shall be performed as specified in concrete repair material specification. Manufacturer specifications/requirements on these issues shall also be followed in the event proprietary bag mix repair materials are used.
3. Contractor shall take care to protect adjacent areas from overspray if "Shotcrete" is used. Area adjacent to repair shall be cleaned to Owner's satisfaction prior to leaving site.

## WI 6.1 COLUMN REPAIR – PARTIAL DEPTH

A. Refer to Work Item 6.0, "Concrete Column Repair" for scope of Work, materials and procedure associated with this Work Item. Refer to Detail 6.1 for specific requirements.

## WI 10.0 EXPANSION JOINT REPLACEMENT

A. Scope of Work

1. Work consists of furnishing all labor, materials, equipment, supervision, and incidentals necessary to remove existing expansion joints, prepare adjacent concrete and furnish and install new expansion joint system. Refer to Detail Series 10.0 for specific requirements.

B. Materials

1. Expansion joint system materials shall be as specified in Section "Expansion Joint Assemblies," installed in strict accordance with manufacturer's recommendations.

C. Execution

1. Contractor shall remove existing expansion materials in manner that minimizes damage to adjacent concrete.
2. Joint materials and associated reference specifications are listed in Work Item "Expansion Joint Repair and Replacement," Article "Materials," above. Joint installation procedures shall be in accordance with referenced specifications and manufacturer's recommendations.

## WI 10.5 EXPANSION JOINT – ADHERED

A. Refer to Work Item 10.0, "Expansion Joint Repair and Replacement" for scope of Work, materials and procedure associated with this Work Item. Refer to Detail 10.5 for specific requirements.

## WI 10.8 EXPANSION JOINT – EXTRUDED NEOPRENE

A. Refer to Work Item 10.0, "Expansion Joint Repair and Replacement" for scope of Work, materials and procedure associated with this Work Item. Refer to Detail 10.8 for specific requirements.

## WI 11.0 CRACK AND JOINT REPAIR

## WI 11.1 SEAL CRACKS AND JOINTS

A. Scope of Work

1. Work consists of furnishing all labor, materials, equipment, supervision, and incidentals necessary to locate, prepare and seal random cracks and unsealed construction joints in concrete floor and/or topping. Refer to Detail 11.1 for specific requirements.

B. Materials

1. Approved materials for use in this Work are specified in Section "Concrete Joint Sealants."

C. Execution

1. Contractor shall thoroughly clean and inspect concrete slabs and/or topping for cracks and unsealed construction joints. Those identified as either greater than 0.03 in. wide or showing evidence of water and/or salt staining on ceiling below shall be sealed. All cracks and joints identified for repair shall be marked with chalk to aid in precision routing. Obtain depths to top reinforcing bars in area of repair by use of a pachometer. Determine depth of electrical conduit (metal or plastic). Do not exceed this depth of routing where the crack to be repaired crosses the embedded items. Damage to embedded items will require repair or replacement at no cost to the Owner.
2. Cracks and construction joints shall be ground or sawcut to an adequate width and depth as required by Work Item Detail. Routing shall be performed by mechanized device that has positive mechanical control over depth and alignment of cut. Handheld power grinders with abrasive disks shall not be used on control/construction joints, but may be used on random cracks.
3. Cavities shall be thoroughly cleaned by either sandblasting or grinding to remove all laitance, unsound concrete and curing compounds which may interfere with adhesion. Groove shall be air blasted to remove remaining debris.
4. Sealant materials and associated reference specifications are listed in Work Item Article "Materials," above. Sealant installation procedures shall be in accordance with referenced specifications for selected material.
5. Traffic topping manufacturer shall verify in writing that joint sealant is compatible with traffic topping. Crack and joint sealant work shall be incidental to traffic topping system.

## WI 11.2 REPAIR CRACK/JOINT SEALANT

A. Scope of Work

1. Work consists of furnishing all labor, materials, equipment, supervision, and incidentals necessary to locate and mark failed joint sealant, remove existing sealant, prepare edges and reseal joints and cracks. Refer to Details 11.2 for specific requirements.

B. Materials

1. Approved materials for use in this Work are specified in Section "Concrete Joint Sealants."

C. Execution

1. Contractor shall locate failed crack/joint sealant by visual inspection.
2. Contractor shall remove existing sealant from joints and/or cracks. When existing joint dimensions do not conform to Detail 11.2, joints shall be routed or sawcut to an adequate width and depth as required by Work Item Detail. Routing shall be

performed by mechanized device that has positive mechanical control over depth and alignment of cut.

3. Cavities shall be thoroughly cleaned by either sandblasting or grinding to remove all remaining sealant and unsound concrete which may interfere with adhesion. Groove shall also be air blasted to remove remaining debris.
4. Sealant materials and associated reference specifications are listed in Work Item "Repair Crack/Joint Sealant," Article "Materials," above. Sealant installation procedures shall be in accordance with referenced specifications for selected material.

## WI 11.5 EPOXY INJECTION

A. Scope of Work

1. Work consists of furnishing all labor, materials, equipment, supervision and incidentals necessary to locate cracks, prepare and pressure inject cracks with an epoxy resin so as to create waterproof barrier and/or structural repair as indicated in the Drawings. Refer to Detail 11.5 for specific requirements.

B. Materials

1. Epoxy injection materials shall be as specified in Division 03 Section “Epoxy Injection Systems.”

C. Execution

1. Epoxy injection work and materials shall be performed in accordance with Division 03 Section "Epoxy Injection Systems."
2. Contractor is responsible for location of all locations requiring epoxy injection prior to start of Work.
3. Contractor shall allow for Engineer/Architect inspection of all epoxy injection sites for condition as specified.
4. No payment will be allowed for Work executed without Engineer/Architect inspection and verification.
5. Remove and patch all ports, holes, temporary seal materials to match existing conditions. This is considered incidental to the Work.
6. Clean and paint the repair area limited to the disturbed surfaces to match existing surfaces.

## WI 11.7 COVE SEALANT

A. Scope of Work

1. Work consists of furnishing all labor, materials, equipment, supervision and incidentals necessary to prepare concrete surfaces and install cove sealant between floor and vertical surfaces as shown on Drawings. Refer to Detail 11.7 for specific requirements.

B. Materials

1. Joint sealant materials shall be as specified in Section "Concrete Joint Sealants."

C. Execution

1. Wall-floor intersection to be sealed shall be thoroughly cleaned by sandblasting to remove all contaminants and foreign material.
2. Entire Work area shall then be cleaned with compressed air to assure that all loose particles have been removed and that intersection is dry.
3. Properly prepared intersection shall be coated evenly and completely with joint primer material on each of intersecting faces in accordance with sealant manufacturer's recommendations.
4. After primer has cured, apply cove sealant to intersection such that sealant extends 0.75 in. onto each of intersecting faces.
5. Work cove sealant into joint so that all air is removed and tool to concave shape such that minimum throat dimension of no less than 0.5 in. is maintained.
6. Remove excess sealant and allow to cure.
7. Apply coating on horizontal and vertical surfaces where shown on Drawings in even layers in strict accordance with manufacturer's recommendations. Sealant material and associated reference specifications are listed in Article "Materials," above. Sealant installation procedures shall be in accordance with referenced specifications for selected material.

## WI 11.8 CUT/GRIND JOINT BETWEEN RETAINING WALL AND COLUMN

A. Scope of Work

1. Work consists of furnishing all labor, materials, equipment, supervision and incidentals necessary to cut a control joint, prepare concrete surfaces and install sealant between the column and retaining wall vertical surfaces as shown on Drawings. Refer to Detail 11.8 for specific requirements.

B. Materials

1. Joint sealant materials shall be as specified in Section "Concrete Joint Sealants." Concrete surface repair materials shall be as specified in “Prepackaged Repair Mortar”.

C. Execution

1. Wall-column intersection joint shall be ground to create a joint a minimum of 3 inches deep. Grind the edges of the cut joint. The area to be sealed shall be thoroughly cleaned by sandblasting to remove all contaminants and foreign material. Repair any adjacent concrete surfaces to this joint with repair mortar.
2. Entire Work area shall then be cleaned with compressed air to assure that all loose particles have been removed and that intersection is dry.

3. Properly prepared intersection shall be coated evenly and completely with joint primer material on each of intersecting faces in accordance with sealant manufacturer's recommendations.
4. After primer has cured, apply cove sealant to intersection such that sealant extends 0.75 in. onto each of intersecting faces.
5. Work sealant into joint so that all air is removed and tool to concave shape such that minimum throat dimension of no less than 0.5 in. is maintained.
6. Remove excess sealant and allow to cure.
7. Apply coating on vertical surfaces where shown on Drawings in even layers in strict accordance with manufacturer's recommendations. Sealant material and associated reference specifications are listed in Article "Materials," above. Sealant installation procedures shall be in accordance with referenced specifications for selected material.

## WI 11.10 REMOVE GROUT/PROVIDE BACKER ROD AND SEALANT AT PRECAST COPING

A. Scope of Work

1. Work consists of furnishing all labor, materials, equipment, supervision and incidentals necessary to remove existing grout, prepare concrete surfaces and install sealant between individual precast coping pieces at the top of the brick walls along the garage elevations and stair/elevator towers as shown on Drawings. Refer to Detail 11.10 for specific requirements.

B. Materials

1. Joint sealant materials shall be as specified in Section "Concrete Joint Sealants."

C. Execution

1. Grind or cut out mortar between precast coping pieces. The joints to be sealed shall be thoroughly cleaned by sandblasting to remove all contaminants and foreign material.
2. Entire Work area shall then be cleaned with compressed air to assure that all loose particles have been removed and that intersection is dry.
3. Properly prepared intersection shall be coated evenly and completely with joint primer material on each of intersecting faces in accordance with sealant manufacturer's recommendations.
4. After primer has cured, apply backer rod and sealant to the joint such that sealant extends 1/16 inch below the surface of the coping.
5. Work sealant into joint so that all air is removed and tool to concave shape.
6. Remove excess sealant and allow to cure.
7. Apply coating on vertical surfaces where shown on Drawings in even layers in strict accordance with manufacturer's recommendations. Sealant material and associated reference specifications are listed in Article "Materials," above. Sealant installation procedures shall be in accordance with referenced specifications for selected material.

**WI 11.11 HORIZONTAL JOINT SEALANT REPAIR AT RETAINING WALL AT BUILDING TUNNEL**

A. Scope of Work

1. Work consists of furnishing all labor, materials, equipment, supervision and incidentals necessary to prepare concrete surfaces and install sealant at the horizontal joint at the top of the retaining wall as shown on Drawings. Refer to Detail 11.11 for specific requirements.

B. Materials

1. Joint sealant materials shall be as specified in Section "Concrete Joint Sealants." Concrete surface repair materials shall be as specified in “Prepackaged Repair Mortar”.

C. Execution

1. The existing horizontal joint shall be ground to create a joint a minimum of 1 inch deep. Grind the edges of the cut joint. The area to be sealed shall be thoroughly cleaned by sandblasting to remove all contaminants and foreign material. Repair any adjacent concrete surfaces to this joint with repair mortar.
2. Entire Work area shall then be cleaned with compressed air to assure that all loose particles have been removed and that intersection is dry.
3. Properly prepared intersection shall be coated evenly and completely with joint primer material on each of intersecting faces in accordance with sealant manufacturer's recommendations.
4. After primer has cured, apply sealant to joint such that sealant is flush with the face of the wall.
5. Work sealant into joint so that all air is removed.
6. Remove excess sealant and allow to cure.
7. Apply coating on vertical surfaces where shown on Drawings in even layers in strict accordance with manufacturer's recommendations. Sealant material and associated reference specifications are listed in Article "Materials," above. Sealant installation procedures shall be in accordance with referenced specifications for selected material.

**WI 11.12 HORIZONTAL JOINT SEALANT REPAIR AT RETAINING WALL BELOW LEVEL1 ENTRY/EXIT**

A. Scope of Work

1. Work consists of furnishing all labor, materials, equipment, supervision and incidentals necessary to prepare concrete surfaces and install sealant at the horizontal joint at the top of the retaining wall as shown on Drawings. Refer to Detail 11.12 for specific requirements.

B. Materials

1. Joint sealant materials shall be as specified in Section "Concrete Joint Sealants." Concrete surface repair materials shall be as specified in “Prepackaged Repair Mortar”.

C. Execution

1. The existing horizontal joint sealant shall be removed along with any debonded concrete at the top of the retaining wall. The area to be sealed shall be thoroughly cleaned by sandblasting to remove all contaminants and foreign material. Repair any adjacent concrete surfaces to this joint with repair mortar.
2. Entire Work area shall then be cleaned with compressed air to assure that all loose particles have been removed and that intersection is dry.
3. Properly prepared intersection shall be coated evenly and completely with joint primer material on each of intersecting faces in accordance with sealant manufacturer's recommendations.
4. After primer has cured, apply sealant to joint such that sealant is flush with the face of the wall.
5. Work sealant into joint so that all air is removed.
6. Remove excess sealant and allow to cure.
7. Apply coating on vertical surfaces where shown on Drawings in even layers in strict accordance with manufacturer's recommendations. Sealant material and associated reference specifications are listed in Article "Materials," above. Sealant installation procedures shall be in accordance with referenced specifications for selected material.

## WI 15.0 PROTECTIVE SEALER

A. Scope of Work

1. Work consists of providing all labor, materials, equipment, supervision and incidentals necessary to prepare surfaces and install protective sealer system on concrete surfaces.

B. Materials

1. Protective sealer system materials shall be as specified in Division 07 Section "Water Repellents."

C. Execution

1. All surfaces scheduled to receive protective sealer system shall be identified by Contractor. Mark with chalk all areas other than floor surfaces which are to be treated.
2. Floor surfaces shall be prepared by shotblast in accordance with referenced specification section.
3. All other surfaces to be treated shall be mechanically brushed, waterblasted, or sandblasted as required and then airblasted prior to application. Use of waterblasting on vertical or overhead surfaces requires adequate drying time before application to achieve proper penetration. Check moisture content with

moisture meter and ensure moisture content is below maximum allowable by material manufacturer.

4. Sealer application shall be as specified in referenced specification section. Overhead and vertical surface application shall be by brush or pressure sprayer.

## WI 15.1 CONCRETE SEALER - FLOORS

A. Refer to Work Item 15.0, "Protective Sealer" for scope of Work, materials and procedure associated with this Work Item.

## WI 16.0 TRAFFIC TOPPING

A. Scope of Work

1. Work consists of furnishing all labor, materials, equipment, supervision and incidentals, including installation of joint sealant materials, necessary to prepare existing floor surfaces and install traffic topping. Coating of all vertical surfaces within Work limits shall be incidental to installation of traffic topping. Refer to Detail series 16.0 for specific requirements.

B. Materials

1. Traffic topping materials shall be as specified in Division 07 Section "Traffic Coatings."

C. Execution

1. Floor surface preparation shall be performed by coating system licensed applicator or under its direct supervision.
2. Shotblast surface preparation is required for floors.
3. Coating system shall be installed by licensed applicators in strict accordance with manufacturer's recommendations and referenced specification section.
4. Crack preparation, including installation of sealant material where required, is incidental to traffic topping work.
5. Coating system shall be thoroughly cured prior to Work areas being returned to service.

## WI 16.1 TRAFFIC TOPPING - VEHICULAR

A. Refer to Work Item 16.0, "Traffic Topping" for Scope of Work, materials and procedure associated with this Work Item. Refer to Detail 16.1 for specific requirements.

## WI 16.2 TRAFFIC TOPPING –PEDESTRIAN WALKWAY TO BUILDING LEVEL 1

A. Refer to Work Item 16.0, "Traffic Topping" for Scope of Work, materials and procedure associated with this Work Item.

## WI 25.0 MECHANICAL - DRAINAGE

## WI 25.2 MECHANICAL - SUPPLEMENTARY FLOOR DRAIN

A. Scope of Work

1. Work consists of furnishing all labor, materials, equipment, supervision and incidentals necessary to supplement existing floor drain system by installing additional drain. Work Item 25.3, "Mechanical - Pipe and Hangers" is directly related to this Work Item. Refer to Detail 25.2 for specific requirements.

B. Materials

1. Approved materials for this Work are as shown on Detail 25.2 and in Division 22 Section "Common Work Results for Plumbing" and Division 22 Section “Facility Storm Drainage Piping”
2. Sealant materials shall be as specified in Division 07 Section "Concrete Joint Sealants."

C. Execution

1. Contractor shall locate and mark all areas where supplemental floor drains are to be installed.
2. Contractor shall verify low points on slab by ponding or elevation survey prior to locating drains.
3. For prestressed concrete construction and in areas noted by Engineer, set drain location and core drain opening only after non-destructive testing verification of clear site.
4. Concrete work shall be as shown on Detail 25.2 and as specified in Work Item 3.0.
5. Drains shall be installed as shown on Detail 25.2.

## WI 25.3 MECHANICAL – SUPPLEMENTARY FLOOR DRAIN PIPING ALLOWANCE

A. Scope of Work

1. Work consists of furnishing all labor, materials, equipment, supervision and incidentals necessary to supplement existing floor drain system by installing pipe and hangers. Work Item 25.2, "Mechanical - Supplementary Floor Drain" is directly related to this Work Item. Refer to Detail 25.3 for specific requirements.

B. Materials

1. Approved materials for this Work are as shown on Detail 25.3 and in Division 22 Section "Common Work Results for Plumbing" and Division 22 Section “Facility Storm Drainage Piping.”

C. Execution

1. Contractor shall locate and mark all areas where supplemental floor drain piping is to be installed.
2. Pipes and hangers shall be installed with adequate positive drainage slope at all locations along pipe runs.
3. Pipes and hangers shall be installed as shown on Detail 25.3 and in accordance with referenced specification section.

## WI 30.0 ELECTRICAL – LIGHTING

## WI 30.4 ELECTRICAL – NEW LIGHT FIXTURES

A. Scope of Work

1. Work consists of furnishing all labor, materials, equipment, supervision and incidentals necessary to install new light fixtures and additional conduit and wiring at the parking structure. For Work Item 30.4 “Electrical – New Light Fixtures”, drawings DE-201 to DE-203 and E-001, E-002 and E-201 to E-203 and E-501 by Engineered Systems & Services (ESS) is defines this Work Item.

B. Materials

1. Refer to Electrical Drawings listed above and Specification Division 22 “Electrical”.

C. Execution

1. Refer to Electrical Drawings listed above and Specification Division 22 “Electrical”.

## WI 30.5 ELECTRICAL – NEW LIGHT FIXTURES JUDGES PARKING AREA

A. Scope of Work

1. Work consists of furnishing all labor, materials, equipment, supervision and incidentals necessary to install new light fixtures and additional conduit and wiring at the parking structure. For Work Item 30.4 “Electrical – New Light Fixtures”, drawings DE-204; E-001, E-002, E-204 and E-501 by Engineered Systems & Services (ESS) is defines this Work Item.

B. Materials

1. Refer to Electrical Drawings listed above and Specification Division 22 “Electrical”.

C. Execution

1. Refer to Electrical Drawings listed above and Specification Division 22 “Electrical”.

## WI 35.0 CONCRETE MASONRY REPAIRS

## WI 35.1 TUCKPOINTING AT MASONRY WALL JOINTS ALLOWANCE.

A Scope of Work

1. Work consists of furnishing all labor, materials, equipment, supervision and incidentals necessary to prepare masonry joint surfaces to install additional mortar. Refer to Detail 35.1 for specific requirements.

B. Materials

1. Refer to detail 35.1.

C. Execution

1. Refer to detail 35.1

## WI 35.2 MASONRY UNIT REPLACEMENT

A Scope of Work

1. Work consists of furnishing all labor, materials, equipment, supervision and incidentals necessary to replace masonry units in a wall. Refer to Detail 35.2 for specific requirements.

B Materials

1. Refer to detail 35.2

C Execution

1. Refer to detail 35.2

## WI 35.3 MASONRY UNIT REPAIR AT SUPPORT ANGLE AND LINTEL AREA.

A Scope of Work

1. Work consists of furnishing all labor, materials, equipment, supervision and incidentals necessary to remove and reinstall existing masonry units at the areas above a wall opening. Refer to Detail 35.3 for specific requirements.

B. Materials

1. Refer to detail 35.3.

C. Execution

1. Refer to detail 35.3

## WI 35.4 PROVIDE BACKER ROD AND SEALANT BETWEEN MASONRY AND CONCRETE SLAB

A Scope of Work

1. Work consists of furnishing all labor, materials, equipment, supervision and incidentals necessary to remove mortar and install backer rod and sealant in the joint between the top of the masonry wall and the underside of the floor slab. Refer to Detail 35.4 for specific requirements.

B. Materials

1. Refer to detail 35.4.

C. Execution

1. Refer to detail 35.4

## WI 35.5 RE-MORTAR JOINTS AT LOOSE MASONRY UNITS AT STAIR TOWERS

A. Scope of Work

1. Work consists of furnishing all labor, materials, equipment, supervision and incidentals necessary to remove mortar and loose masonry unit and reinstall the unit with a new mortar joint. Refer to Detail 35.5 for specific requirements.

B. Materials

1. Refer to detail 35.5.

C. Execution

1. Refer to detail 35.5

## WI 35.6 ROUTE AND SEAL CRACKS IN MASONRY WALL

A. Scope of Work

1. Work consists of furnishing all labor, materials, equipment, supervision and incidentals necessary to route and seal cracks in masonry wall as denoted on the drawings. Refer to Detail 35.6 for specific requirements.

B. Materials

1. Refer to detail 35.6.

C. Execution

1. Refer to detail 35.6

## WI 35.7 REPLACE VERTICAL SEALANT BETWEEN BRICK AND MASONRY AT WALL OPENING

A. Scope of Work

1. Work consists of furnishing all labor, materials, equipment, supervision and incidentals necessary to replace the vertical sealant between the brick and masonry wall at the wall opening as denoted on the drawings. Refer to Detail 35.7 for specific requirements.

B. Materials

1. Refer to detail 35.7.

C. Execution

1. Refer to detail 35.7

## WI 40.0 CONNECTIONS/BEARINGS

## WI 40.6 ANGLE CONNECTION FOR VERTICAL PRECAST INFILL PANEL

A. Scope of Work

1. Work consists of furnishing all labor, materials, equipment, shoring and jacking, supervision and incidentals necessary to install new angle connectors for the precast infill panel as indicated on the Drawings. Refer to Detail 40.6 for specific requirements.

B. Materials

1. Refer to detail 40.6.

C. Execution

1. Refer to detail 40.6

## WI 44.0 MISCELLANEOUS

## WI 44.1 RESTRESS LOOSE BARRIER CABLES

A. Scope of Work

1. Work consists of furnishing all labor, materials, equipment, supervision and incidentals necessary to restress loose barrier cables per Detail 44.1 and as located on Drawings.

B. Materials

1. Refer to detail 44.1.

C. Execution

1. Contractor shall locate and verify with Engineer/Architect all Work areas.
2. Work shall be carried out in accordance with detail 44.1 with emphasis on power seating the existing wedges on each end of the cable.

## WI 44.2 CLEANING AND DEGREASING FLOORS

A. Scope of Work

1. Work consists of furnishing all labor, materials, equipment, supervision and incidentals necessary to degrease all parking stalls and power wash all driving and parking surfaces.
2. Preliminary work includes sample mock-up cleanings using various combinations of cleaning products and techniques to establish required end results to be applied to the balance of areas to be cleaned.
3. Work includes pre-treatment, containment, post-treatment and disposal of run-off/by-products from cleaning operations as required to meet local requirements of jurisdiction where project is located. Coordinate and verify requirements with local agencies as required prior to start of cleaning work.

B. Materials

1. Pressure washer capable of providing 3,000-5,000 PSI nozzle pressure.
2. Cleaning products used shall not damage substrates (i.e. trisodium phosphate for degreasing). Use only products shown to effectively clean substrates without damage. Submit to Architect/Engineer for review.
3. Cleaning/rinse water shall be potable water with mineral content that will not stain cleaned building surfaces. Treat/filter water prior to use if required to eliminate staining potential.
4. Equipment used for application of cleaning products/media shall be adjusted and calibrated as required on an ongoing basis to keep from damaging existing substrates.
5. Specific products and techniques shall be as stated in the applicable work items.

C. Execution

1. Contractor to provide 10 feet by 10 feet mock-up to be incorporated with finished product. Mock-up to be reviewed and approved by Owner and Engineer prior to completion of scope of Work Item.
2. Pressure clean (3,000-5,000 PSI nozzle pressure) to remove all dust, dirt, oil, grease, loose particles, laitance, mildew, fungus, and foreign materials. Allow surface to dry completely before allowing traffic to re-enter the area.
3. Contractor shall degrease all parking stalls prior to power washing operations.
4. Mask all surfaces that may be adversely affected by run-off from cleaning operations.
5. Perform cleaning at times acceptable to Owner with regard to impact of cleaning materials and operations on building operations and impact on the general public, pedestrians and property surrounding the project site.
6. Contractor shall collect and discharge water, including chemicals used, into sanitary sewer (with City's permission) or dispose at an industrial wastewater facility.

D. Rinse all surfaces after cleaning as required to remove all residual cleaning materials. More than one rinse may be required depending on cleaning materials and building conditions.

**WI 44.3 PRECAST CAP STONE RE-ANCHORING**

A. Scope of Work

1. Work consists of furnishing all labor, materials, equipment, supervision and incidentals necessary to reattach loose precast cap stone pieces as shown on drawing R-504.

B. Materials

1. Refer to drawing R-504.

C. Execution

1. Refer to drawing R-504.

**WI 44.11 REATTACH LOOSE LIGHTNING PROTECTION AIR TERMINAL (ALLOWANCE)**

A. Scope of Work

1. Work consists of furnishing all labor, materials, equipment, supervision and incidentals necessary to reattach the anchors for the loose lighting protection cable and air terminals.

B. Materials

1. Match existing materials for providing cable clips. Use Ultrabond HS-1CC epoxy for reattaching the air terminals and cable clips.

C. Execution

1. Clean off any existing epoxy residue from the copper material and apply new epoxy in strict accordance with manufacturer's instructions.

## WI 44.13 STRENGTHEN BASE CONNECTION OF CABLE RAIL SUPPORT TUBE

A. Scope of Work

1. Work consists of furnishing all labor, materials, equipment, shoring and jacking, supervision and incidentals necessary to strengthen the base connection of the cable rail support tube. Refer to Detail 44.13 for specific requirements.

B. Materials

1. Refer to detail 44.13.

C. Execution

1. Refer to detail 44.13

## WI 45.0 PAINTING

## WI 45.1 PAINT TRAFFIC MARKINGS

A. Scope of Work

1. Work consists of furnishing all labor, materials, equipment, supervision and incidentals necessary to locate, layout and paint parking stall stripes, traffic arrows, crosswalks, accessible stall access aisles, curbs, symbols, stop bars and all other required pavement markings.

B. Materials

1. Painting materials shall be as specified in Division 09 Section "Pavement Marking."

C. Execution

1. Unless otherwise indicated in the Construction Documents, stripes and paint color shall match all existing marks and be provided at same locations.
2. Where new striping layout is described in the Construction Documents that conflicts with existing striping layout, remove existing stripes in those locations where they conflict with new striping layout. See referenced specification section for removal requirements.

3. Where existing traffic marking layout is to be maintained, Contractor shall prepare drawing of existing traffic marking layout in work areas prior to starting with repairs. Contractor shall note stall width, angle of parking, directional traffic arrows and all other existing pavement markings.
4. Contractor shall submit striping plan for Engineer/Architect's review.
5. Engineer/Architect may inspect all layout and surface preparation for conditions in accordance with Division 09 Section "Pavement Marking."

## WI 45.2 PAINT TRAFFIC MARKINGS – ADD ALTERNATE GROUND AND LEVEL 1

A. Scope of Work

1. Work consists of furnishing all labor, materials, equipment, supervision and incidentals necessary to locate, layout and paint parking stall stripes, traffic arrows, crosswalks, accessible stall access aisles, curbs, symbols, stop bars and all other required pavement markings. Refer to WI 45.1 for materials and execution.

## WI 45.3 PAINT HANDRAILS AND GUARDRAILS IN STAIR TOWERS

A. Scope of Work

1. Work consists of furnishing all labor, materials, equipment, supervision and incidentals necessary to contain, with full height barriers, preparation debris and paint during operations and prepare, prime and paint the handrail and guard rail system in the stair towers as located on the Drawings.

B. Materials

1. Paint materials shall be as specified in Division 09 Section “Exterior Painting.”

C. Execution

1. Contractor shall locate and verify with Engineer/Architect all Work areas.
2. Contractor shall verify color selection with Owner prior to start of Work.
3. Contractor shall take all necessary measures to contain, with full height barriers, sandblasting debris and paint to immediate Work area to protect public from injury and property from damage.
4. Contractor shall solvent clean any surface area with oil or grease build-up prior to receiving additional preparation in accordance with SSPC-SP1 and Division 09 Section "Exterior Painting."
5. Contractor shall prepare all surfaces with surface corrosion in accordance with SSPC-SP3 “Power Tool Cleaning” or SSPC-SP12 “Low Pressure Water Cleaning” and Division 09 Section "Exterior Painting."
6. Contractor shall remove all debris from Work area prior to application of primer or paint.
7. Contractor shall apply primer to all prepared metal surfaces on same day (within 8 hrs) as preparation operations. Apply primer and Paints according to Division 09

Section "Exterior Painting" and in strict accordance with manufacturer's recommendations.

## WI 45.4 DOORS AND FRAMES

A. Scope of Work

1. Work consists of furnishing all labor, materials, equipment, supervision and incidentals necessary to contain, with full height barriers, preparation debris and paint during operations and prepare, prime and paint all doors and door frames as located on Drawings.

B. Materials

1. Paint materials shall be as specified in Division 09 Section “Exterior Painting.”

C. Execution

1. Refer to the Execution section stated in work Item 45.3.

## WI 45.5 RELOCATE ADA STALLS AS INDICATED ON THE PLANS. GROUND AND LEVEL 1

A. Scope of Work

1. Work consists of furnishing all labor, materials, equipment, supervision and incidentals necessary to locate, layout and paint parking stall stripes, traffic arrows, crosswalks, accessible stall access aisles, curbs, symbols, stop bars and all other required pavement markings. Refer to WI 45.1 for materials and execution.

## WI 45.7 PAINT INTERIOR COLUMN BASES COVERED LEVELS

A. Scope of Work

1. Work consists of furnishing all labor, materials, equipment, supervision and incidentals necessary to locate, layout and paint existing concrete column surfaces as identified on the drawings.

B. Materials

1. Paint materials shall be as specified in Division 09 Section “Exterior Painting.”

C. Execution

1. Contractor shall locate and layout Work areas as indicated on Drawings.
2. Contractor shall prepare surface to be painted in accordance with Division 09 Section "Exterior Painting" and manufacturer's recommendations.

## WI 45.8 PAINT SUPPORT ANGLES AT CMU WALLS

A. Scope of Work

1. Work consists of furnishing all labor, materials, equipment, supervision and incidentals necessary to contain, with full height barriers, preparation debris and paint during operations and prepare, prime and paint all steel angles and embedment plates at the top of the CMU walls as located on Drawings.

B. Materials

1. Paint materials shall be as specified in Division 09 Section “Exterior Painting.”

C. Execution

1. Refer to the Execution section stated in work Item 45.3.

## WI 45.9 PAINT COLUMN PEDESTALS TOP LEVEL

A. Scope of Work

1. Work consists of furnishing all labor, materials, equipment, supervision and incidentals necessary to locate, layout and paint existing concrete column surfaces as identified on the drawings.

B. Materials

1. Paint materials shall be as specified in Division 09 Section “Exterior Painting.”

C. Execution

1. Refer to the Execution section stated in work Item 45.7.

## WI 45.10 PAINT STEEL CABLE RAIL SUPPORT AND BASE PLATE

A. Scope of Work

1. Work consists of furnishing all labor, materials, equipment, supervision and incidentals necessary to contain, with full height barriers, preparation debris and paint during operations and prepare, prime and paint steel tube supports, and embedded base plate as located on Drawings.

B. Materials

1. Paint materials shall be as specified in Division 09 Section “Exterior Painting.”

C. Execution

1. Refer to the Execution section stated in work Item 45.3.

## WI 45.11 PAINT PRECAST PANEL CONNECTIONS

A. Scope of Work

1. Work consists of furnishing all labor, materials, equipment, supervision and incidentals necessary to contain, with full height barriers, preparation debris and paint during operations and prepare, prime and paint steel angle connections and embedment plates at the precast panels as located on Drawings.

B. Materials

1. Paint materials shall be as specified in Division 09 Section “Exterior Painting.”

C. Execution

1. Refer to the Execution section stated in work Item 45.3.

## WI 45.11 PAINT STEEL PIPE BOLLARDS AND BASES

A. Scope of Work

1. Work consists of furnishing all labor, materials, equipment, supervision and incidentals necessary to contain, with full height barriers, preparation debris and paint during operations and prepare, prime and paint steel pipe bollards and base plates as located on Drawings.

B. Materials

1. Paint materials shall be as specified in Division 09 Section “Exterior Painting.”

C. Execution

1. Refer to the Execution section stated in work Item 45.3.

## WI 80.0 BRICK FAÇADE

## WI 80.1 EXTERIOR BRICK FAÇADE REPAIRS

A. Scope of Work

1. Work consists of furnishing all labor, materials, equipment, supervision and incidentals necessary to repair/replace damage brick units and install expansion joints. For Work Item 80.1 “Exterior Brick Façade Repairs” refer to drawings A4.1 and A4.2 by 2WR Partners.

B. Materials

1. Refer to drawings A4.1 and A4.2 by 2WR Partners.

C. Execution

1. Contractor shall locate and mark all brick to be replaced. Architect shall verify replacement locations prior to start of Work.
2. Contractor shall remove all existing fractured, cracked, spalled, broken or structurally unsound brick and all brick damaged during removal and toothing work.
3. Entire cavity of removed brick shall be thoroughly cleaned of all mortar from top, bottom, and both sides of all brick surrounding new brick work. Do not allow mortar droppings to accumulate in cavity space, in weep holes, or on flashing. Architect shall inspect all cavities for condition prior to commencement of new construction.
4. New brick shall be anchored to backing with flexible metal ties embedded in masonry joints and attached to existing structure as shown on the drawings.
5. Flush cavity thoroughly with water to remove all dust and laitance prior to brick replacement. Take all necessary precautions to prevent water from entering cavity space during cleaning operations. Allow excess water to run off. New brick or existing brick removed from building shall be laid in full bed of mortar while wall is still damp. All brick repair work shall be flush with existing.
6. New brick work is to be toothed into existing brick work.
7. All bed and head joints shall be fully filled with mortar. Collar joints shall remain clear of mortar in single wythe veneer construction. For multi-wythe brick construction, fill collar joints.
8. Prior to initial set of mortar, tool joints to match existing.
9. Adequate weather protection shall be installed over all areas left open at completion of each day's work.
10. Allow 3 to 7 days for mortar to harden prior to cleaning of brick wall.
11. Dispose of all accumulated material and leave premises in clean condition.
12. Brick surfaces that become dirty or smeared during joint cutting and repointing of joint surfaces shall be cleaned with bristle brushes and plain water.
13. Unnecessary damage to surrounding brick shall be repaired by Contractor at no cost to Owner.

**END OF SECTION 020010**

## SECTION 025130 - GENERAL CONCRETE SURFACE PREPARATION

## PART 1 - GENERAL

### 1.1 DEFINITIONS

A. **DELAMINATIONS**: Fracture planes, "internal cracks," within concrete. Typically these fractures are parallel to the member face and vary in depth.

B. **NEAR-VERTICAL CHIPPED EDGES:** Provide an edge dressed to within 20º of perpendicular of finished surface.

C. **SPALLS:** Potholes, cavities or voids in floor slabs, beams, columns, and walls. Usually result of delamination migrating to face of concrete member. When fracture finally reaches surface, concrete encompassed by delamination breaks away, resulting in spall.

D. **UNSOUND CONCRETE:** Concrete exhibiting one or more of:

1. Incipient fractures present beneath existing delaminated or spalled surfaces.
2. Honeycombing.
3. Friable or punky areas.
4. Deterioration from freeze-thaw action.

E. **SCALING:** Deterioration which attacks mortar fraction (paste) of concrete mix. First appears as minor flaking and disintegration of concrete surface. Scaling eventually progresses deeper into concrete, exposing aggregate which breaks away. Concrete scaling is caused by freeze-thaw action. If concrete is frozen in saturated state, excess water freezing in concrete causes high internal stresses.

F. **SHOTBLASTING:** Scarification of concrete surfaces using an abraded metal shot-rebound. See Corps of Engineer's Manual EM 1110-2-2002 and the National Cooperative Highway Research Program's Report #99 for a more detailed definition.

## PART 2 - PRODUCTS (NOT APPLICABLE)

## PART 3 - EXECUTION (NOT APPLICABLE)

## END OF SECTION 025130

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# SECTION 025140 - SURFACE PREPARATION FOR PATCHING

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 SUMMARY

A. This Section includes the provision of all labor, materials, equipment, supervision and incidentals necessary to locate and remove all delaminated and unsound concrete and preparation of cavities created by removal to receive patching material and preparation of existing surface spalls and potholes to receive patching material.

B. Related Sections: Following Sections contain requirements that relate to this Section:

1. Division 3 Section "Trowel Applied Mortar"

### 1.3 REFERENCES

A. "Specifications for Structural Concrete for Buildings" (ACI 301) by American Concrete Institute, herein referred to as ACI 301, is included in total as specification for this structure except as otherwise specified herein.

B. Comply with provisions of following codes, specifications and standards except where more stringent requirements are shown on Drawings or specified herein:

1. "Guide for Repair of Concrete Bridge Superstructures" (ACI 546.1), American Concrete Institute.
2. “Building Code Requirements for Structural Concrete and Commentary” (ACI 318-08) American Concrete Institute.
3. “Guide for Selecting Application Methods for the Repair of Concrete Surfaces” (ICRI Technical Guideline No. 320.1R-1996), International Concrete Repair Institute.
4. “Guide for Surface Preparation for the Repair of Deteriorated Concrete Resulting from Reinforcing Steel Corrosion” (ICRI Technical Guideline No. 310.1R-2008) International Concrete Repair Institute.

## PART 2 - PRODUCTS (NOT APPLICABLE)

## PART 3 - EXECUTION

### 3.1 INSPECTION

A. Floor Slabs:

1. Floor slab delaminations: locate by sounding surface with hammer, rod, or chain drag.
2. When delaminated area is struck, distinct hollow sound is heard.
3. Contractor: sound all designated floors for delaminations.
4. Certain structural systems that contain thin slab thicknesses with Welded Wire Reinforcement or other small diameter reinforcing, such as precast tees, may have significant deterioration without evidence of delaminations. These structural systems require qualified personnel to provide additional inspections, primarily visual in nature, to define the extent of deterioration.
5. Contractor: Visually inspect thin slab thicknesses with small diameter reinforcing for deterioration.

B. Vertical and Overhead Surfaces:

1. Vertical and overhead surface delaminations: locate by sounding appropriate member with hammer or rod.
2. Cracks, usually horizontal in orientation along beam faces, and vertical in orientation near column corners are indicators of delaminated concrete.
3. Contractor: sound only vertical and overhead surfaces that show evidence of cracking and/or salt and water staining.

C. Delaminated areas, once located by Contractor, shall be further sounded to define limits. Mark limits with chalk or paint.

D. Contractor: locate spalls by visual inspection and mark boundaries with chalk or paint after sounding surface.

E. Engineer will define and mark additional unsound concrete areas for removal, if required.

F. Areas to be removed shall be as straight and rectangular as practical to encompass repair and provide neat patch.

G. Contractor: Locate and determine depth of all embedded REINFORCEMENT, PRESTRESSING TENDONS, and ELECTRICAL CONDUIT in repair area and mark these locations for reference during concrete removal. Do **NOT** nick or cut any embeds unless approved by Engineer.

## 3.2 PREPARATION

A. **Temporary shoring may be required at concrete floor repair areas exceeding 10 sq ft and at any beam, joist, or column repair. Contractor: Review all marked removal and preparation areas and request clarification by Engineer of shoring requirements in questionable areas. Shores shall be in place prior to concrete removal and cavity preparation in any area requiring shores**.

B. Delaminated, spalled and unsound concrete floor areas: mark boundaries. All concrete shall be removed from within marked boundary to minimum depth of 0.75 in. using 15 to 30 lb chipping hammers equipped with chisel point bits. When directed by Engineer, chipping hammers less than 15 lb shall be used to minimize damage to sound concrete. If delaminations exist beyond minimum removal depth, chipping shall continue until all unsound and delaminated concrete has been removed from cavity.

C. Where embedded reinforcement or electrical conduit is exposed by concrete removal, exercise extra caution to avoid damaging it during removal of unsound concrete. If bond between exposed embedded reinforcement and adjacent concrete is impaired by Contractor's removal operations, Contractor shall perform additional removal around and beyond perimeter of reinforcement for minimum of 0.75 in. along entire length affected at no cost to Owner.

D. If rust is present on embedded reinforcement where it enters sound concrete, additional removal of concrete along and beneath reinforcement required. Additional removal shall continue until non-rusted reinforcement is exposed, or may be terminated as Engineer directs.

E. Sawcut to depth of 0.75 in. into floor slab, unless otherwise noted. For vertical and overhead surfaces marked boundary may be sawcut, ground or chipped to depth of 0.5 in. to 0.625 in. into existing concrete, measured from original surface. All edges shall be straight and patch areas square or rectangular-shaped. Diamond blade saw or grinder with abrasive disk suitable for cutting concrete is acceptable for performing work. Edge cut at delamination boundary shall be dressed perpendicular to member face. It shall also be of uniform depth, for entire length of cut. Exercise extra caution during sawcutting to avoid damaging existing reinforcement and electrical conduit and any other embedded items near surface of concrete. Any damage to existing reinforcement, post-tensioning tendons or sheathing during removals shall be repaired by Contractor with Engineer-approved methods at no additional cost to Owner.

## 3.3 INSPECTION OF REPAIR PREPARATION

A. After removals are complete, but prior to final cleaning, cavity and exposed reinforcement shall be inspected by Contractor and verified by Engineer for compliance with requirements of this Section. Where Engineer finds unsatisfactory cavity preparation, Engineer shall direct Contractor to perform additional removals. Engineer shall verify areas after additional removals.

B. Contractor shall inspect embedded reinforcement and conduits exposed within cavity for defects due to corrosion or damage resulting from removal operations. Contractor shall notify Engineer of all defective and damaged reinforcement or conduits. Replacement of damaged or defective reinforcement or conduits shall be performed according to this Section and as directed by Engineer.

## 3.4 REINFORCEMENT AND EMBEDDED MATERIALS IN REPAIR AREAS

A. All embedded reinforcement exposed during surface preparation that has lost more than 15% of original cross-section due to corrosion shall be considered DEFECTIVE. All non-defective exposed reinforcement that has lost section to extent specified above as direct result of Contractor's removal operations shall be considered DAMAGED.

B. **Embedded materials** including, but not limited to, electrical conduit, corrosion protection systems and snow/ice melting equipment **shall be protected by Contractor** during removal operations. **Damage due to removal operations shall be repaired by Contractor in accordance with national code requirements at no cost to Owner.** Embedded materials which are defective due to pre-existing conditions may be repaired or replaced by Contractor or abandoned at Owner's option and cost.

C. Supplement defective or damaged embedded reinforcement by addition of reinforcement of equal diameter with Class "B" minimum splice per ACI 318 beyond damaged portion of reinforcement. Secure new reinforcement to existing reinforcement with wire ties and/or approved anchors. Supplemental reinforcement shall be ASTM A615 Grade 60 steel installed in accordance with Work Item “Concrete Reinforcement."

D. Loose and supplemental reinforcement exposed during surface preparation shall be securely anchored prior to patch placement. Loose reinforcement shall be adequately secured by wire ties to bonded reinforcement or shall have drilled-in anchors installed to original concrete substrate. Drilled-in anchors shall be Powers “Tie-Wire Lok-Bolt” anchors, ITW Ramset/Red Head “TW-1400” anchor, or approved equivalent. Supplemental reinforcing needed to be held off substrate shall be adequately secured by drilled-in anchors installed to original concrete substrate with Powers “Tie-Wire Spike”, ITW Ramset/Red Head Redi-Drive “TD4-112” anchors, or approved equivalent. Engineer will determine adequacy of wire ties and approve other anchoring devices prior to their use. Securing loose and supplemental reinforcement is incidental to surface preparation and no extras will be allowed for this Work.

E. Concrete shall be removed to provide minimum of 3/4 in. clearance on all sides of defective or damaged exposed embedded reinforcement that is left in place. Minimum of 1.5-in. concrete cover shall be provided over all new and existing reinforcement. Concrete cover over reinforcement may be reduced to 1 in. with Engineer's approval if coated with an approved epoxy resin.

F. Supplemental reinforcement and concrete removals required for repairs of defective or damaged reinforcement shall be paid for as follows:

1. Concrete removals and supplemental reinforcement required for repairs of DEFECTIVE reinforcement shall be incidental to work item WI 1.1 “Project Mobilization”.
2. Concrete removals and supplemental reinforcement required for repairs of DAMAGED reinforcement shall be paid for by Contractor.

## 3.5 CLEANING OF REINFORCEMENT WITH DELAMINATION AND SPALL CAVITIES

A. All exposed steel shall be cleaned of rust to bare metal by sandblasting. Cleaning shall be completed immediately before patch placement to insure that base metal is not exposed to elements and further rusting for extended periods of time. Engineer may require entire bar diameter be cleaned.

## 3.6 PREPARATION OF CAVITY FOR PATCH PLACEMENT

A. Cavities will be examined prior to commencement of patching operations. Sounding surface shall be part of examination. Any delamination noted during sounding shall be removed as specified in this Section.

B. Cavities shall be sandblasted. Airblasting is required as final step to remove sand. All debris shall be removed from site prior to commencement of patching.

**END OF SECTION 025140**

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# SECTION 033760 – PREPACKAGED REPAIR MORTAR

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 SUMMARY

A. This Section includes the provision of all labor, materials, supervision and incidentals necessary to prepare deteriorated or damaged concrete surfaces and install prepackaged concrete repair mortar to formed horizontal, vertical and overhead surfaces to restore original surface condition and integrity.

B. Related Sections: Following Sections contain requirements that relate to this Section:

1. Division 01 Section "Submittal Procedures."
2. Division 02 Section "Work Items."
3. Division 02 Section "General Concrete Surface Preparation."
4. Division 02 Section "Surface Preparation for Patching."
5. Division 07 Section “Concrete Joint Sealants.”
6. Division 07 Section "Traffic Coatings."
7. Division 09 Section "Pavement Marking."

### 1.3 QUALITY ASSURANCE

A. Work shall conform to requirements of ACI 301 as applicable except where more stringent requirements are shown on Drawings or specified in this Section.

B. Testing Agency:

1. Independent testing laboratory employed by Owner and acceptable to Engineer.
2. Accredited by AASHTO under ASTM C1077. Testing laboratory shall submit documented proof of ability to perform required tests.

C. Sampling and testing of mortar shall be performed by ACI certified Concrete Field Technicians Grade I. Certification shall be no more than three years old.

D. Testing Agency is responsible for conducting, monitoring and reporting results of all tests required under this Section. Testing Agency has authority to reject mortar not meeting Specifications. Testing Agency does not have the authority to accept mortar that does not meet specifications.

E. Testing Agency shall submit the following information for Field Testing of Concrete unless modified in writing by Engineer:

1. Project name and location.
2. Contractor's name.
3. Testing Agency's name, address and phone number.
4. Mortar manufacturer.
5. Date of report.
6. Testing Agency technician's name (sampling and testing).
7. Placement location within structure.
8. Weather data:

    a. Air temperatures.
    b. Weather.
    c. Wind speed.

9. Date, time, and place of test.
10. Compressive test data:

    a. Cube or cylinder number.
    b. Age of sample when tested.
    c. Date and time of test.
    d. Compressive strength.

## 1.4 REFERENCES

A. "Standard Specification for Structural Concrete" (ACI 301) by American Concrete Institute, herein referred to as ACI 301, is included in total as specification for this structure except as otherwise specified herein.

B. Comply with provisions of following codes, specifications and standards except where more stringent requirements are shown on Drawings or specified herein:

1. "Building Code Requirements for Structural Concrete" (ACI 318), American Concrete Institute, herein referred to as ACI 318.
2. "Hot Weather Concreting" reported by ACI Committee 305.
3. "Cold Weather Concreting" reported by ACI Committee 306.
4. “Standard Specification for Curing Concrete” (ACI 308.1)

C. Contractor shall have following ACI publications at Project construction site at all times:

1. "Standard Specifications for Structural Concrete (ACI 301) with Selected ACI and ASTM References," ACI Field Reference Manual, SP15.
2. "Hot Weather Concreting" reported by ACI Committee 305.
3. "Cold Weather Concreting" reported by ACI Committee 306.

D. American Society for Testing and Materials (ASTM):

1. ASTM C109, "Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or 50-mm Cube Specimens)."
2. ASTM C31, “Test Method for Compressive Strength of Cylindrical Concrete Specimens.”
3. ASTM C1583, “Standard Test Method for the Tensile Strength of Concrete Surfaces and the Bond Strength or Tensile Strength of Concrete Repair and Overlay Materials by Direct Tension (Pull-off Method)”

## 1.5 SUBMITTALS

A. Make submittals in accordance with requirements of Division 01 and as specified in this Section.

B. Contractor: At preconstruction meeting, submit procedures for demolition, surface preparation, material batching, placement, finishing, and curing of application. Provide procedure to protect fresh patches from severe weather conditions.

C. Testing Agency: Promptly report all mortar test results to Engineer and Contractor. Include following information:

1. See Article "Quality Assurance," paragraph "Testing Agency shall submit...."
2. Strength determined in accordance with ASTM C109.

# PART 2 - PRODUCTS

## 2.1 MANUFACTURERS

A. Manufacturer: Subject to compliance with requirements, provide products of one of following, only where specifically named in product category:

1. BASF Building Systems (BASF), Shakopee, MN
2. Euclid Chemical Corporation (Euclid), Cleveland, OH
3. Mapei Corporation (MAPEI), Deerfield Beach, FL
4. Sika Corporation (Sika), Lyndhurst, NJ.

## 2.2 MATERIALS

A. Horizontal Repair and Form and Pour Mortar: Shall be prepackaged cementitious repair mortar capable of horizontal and form and pour partial depth applications**,** achieving a minimum 3,000 psi compressive strength at 7 days and 5,000 psi compressive strength at 28 days per ASTM C39 as certified by manufacturer with maximum lineal shrinkage of 0.10% at 28 days. Extend per manufacturer’s instructions as required for deeper placements.

1. Acceptable cementitious repair materials for this Work are as follows:

    a. “MasterEmaco S440,” by BASF.
    b. “Eucocrete,” by Euclid.
    c. “Planitop 11,” by MAPEI.
    d. “Sikacrete 211,” by Sika.
    e. Other types may be used only with Engineer's approval in writing prior to bidding.

B. Trowel Applied Repair Mortar: Shall be prepackaged, cementitious repair mortar capable of vertical/overhead application by trowel achieving a minimum 3,000 psi compressive strength at 7 days and 4,500 psi compressive strength at 28 days per ASTM C 109 as certified by manufacturer.

1. Acceptable materials for this Work are as follows:

    a. “MasterEmaco N425,” by BASF.
    b. “Verticoat Supreme,” by Euclid.
    c. “Planitop XS,” by MAPEI
    d. “Sikaquick VOH,” by Sika.
    e. Other types may be used only with Engineer's approval in writing prior to bidding.

C. Horizontal Topping Mortar: Shall be prepackaged cementitious repair mortar capable of horizontal partial depth applications on minimum thickness of 0.5 inches and a maximum thickness of 2 inches**,** achieving a minimum 3,000 psi compressive strength at 7 days and 5,000 psi compressive strength at 28 days per ASTM C109 as certified by manufacturer. The mortar is not to be extended.

1. Acceptable materials for this Work are as follows:

    a. “MasterEmaco T1061,” by BASF.
    b. “Concrete Top Supreme,” by Euclid.
    c. “Planitop 15,” by MAPEI.
    d. “SikaTop 111 Plus,” by Sika.
    e. Other types may be used only with Engineer's approval in writing prior to bidding.

## 2.3 MATERIAL ACCESSORIES

A. Extended Open Time Epoxy Bonding Agent: Three component, water based, epoxy modified portland cement bonding agent and corrosion inhibitor coating providing the recommended Manufacturer’s open time in which to apply repair mortar.

1. Acceptable materials for this Work are:

    a. “MasterEmaco P124,” by BASF.
    b. “Duralprep A.C.,” by Euclid.
    c. “Planibond 3C,” by MAPEI.

d. “Armatec 110 EpoCem”, by Sika.

B. Clear, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B.

C. Clear, Solvent-Borne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type 1, Class A.

D. Clear, Waterborne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type 1, Class A.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

A. Epoxy Bonding Agent Extended Open Time**:**

1. In strict accordance with manufacturer’s recommendations, mix and apply epoxy bonding agent to all areas as indicated on Drawings**.**
2. Allow epoxy bonding agent to dry a minimum 2 hours, but no more than the Manufacturer’s recommended open time prior to placing repair mortar.

B. Mortar Placement: Mortar materials shall be placed in strict accordance with manufacturer's instructions. Properly proportioned and mixed mortar material shall be placed using tools to consolidate mortar so that no voids exist within new material and continuous contact with base concrete is achieved.

C. Form and Pour Repair Mortar Placement: Mix and apply in strict accordance with manufacturer’s written instructions, to achieve a maximum 9” slump. Consolidate mortar so that no voids exist and continuous contact with base concrete is achieved.

D. Vertical and Overhead Repairs: Mortar materials shall be placed in strict accordance with manufacturer's instructions. Properly proportioned and mixed mortar material shall be placed using tools to consolidate mortar so that no voids exist within new material and continuous contact with base concrete is achieved. Supplemental wire mesh shall be required for delamination and spall repairs greater than two inches in depth.

E. Finishing:

1. Apply a nonslip broom finish to top of floor patches and to exterior concrete platforms, steps, and ramps. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route.
2. Provide a surface finish similar to adjacent surfaces for vertical and overhead partial depth repairs.
3. Finish formed surfaces similar to adjacent surfaces.

## 3.2 CONCRETE PROTECTION AND CURING

A. Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 305R for hot-weather protection during placement. Keep concrete continually moist prior to final curing by evaporation retarder, misting, sprinkling, or using absorptive mat or fabric covering kept continually moist.

B. Immediate upon conclusion of finishing operation cure concrete in accordance with ACI 308.1 for duration of at least seven (7) days by curing methods listed below. Provide additional curing immediately following initial curing and before concrete has dried.

1. During initial and final curing periods maintain concrete above 50°.
2. Prevent rapid drying at end of curing period.

C. Concrete surfaces to receive slab coatings or penetrating sealers shall be cured with moisture curing or moisture-retaining-cover curing.

D. Curing Methods: Cure formed and non-formed concrete moisture curing, moisture-retaining-cover curing, curing compound, or a combination of these as follows:

1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:

    a. Water.
    b. Continuous water-fog spray.
    c. Absorptive cover, water saturated and kept continuously wet. Cover concrete surfaces and edges with 12-inch (300-mm) lap over adjacent absorptive covers.

2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
3. Curing compound: Apply curing compound in accordance with manufacturer’s instructions.

## 3.3 FIELD QUALITY CONTROL

A. Testing Agency**:** Owner shall engage a qualified independent testing and inspecting agency acceptable to the Engineer to sample materials, perform tests, and submit test reports during concrete placement according to requirements specified in this Article. Perform tests according to ACI 301.

B. Testing Frequency: Perform one set of strength testing and one bond test for each product used for each day's work. Prepare samples in accordance with ASTM C31.

C. Compressive Strength Testing: Determine strength at**,** 7 and 28 days. Each test shall consist of two 6-inch diameter cylinders or three 4-inch diameter cylinders. Testing shall be in accordance with ASTM C39.

D. Compressive Strength Testing: Determine strength at**,** 7, and 28 days. Each test shall consist of three 2-inch cubes. Testing shall be in accordance with ASTM C109 using as placed mortar.

## 3.4 EVALUATION AND ACCEPTANCE OF WORK

A. Acceptance of Repairs (ACI 301):

1. Acceptance of completed concrete Work will be according to provisions of ACI 301.
2. Repair areas shall be sounded by Engineer and Contractor with hammer or rod after curing for 72 hours. Contractor shall repair all hollowness detected by removing and replacing patch or affected area at no extra cost to Owner.
3. If shrinkage cracks appear in repair area when initial curing period is completed, repair shall be considered defective, and it shall be removed and replaced by Contractor at no extra cost.
4. Patches shall be considered defective if average strength does not meet minimum strength at 28 days or if average bond strength does not meet minimum requirements of 150 psi.

**END OF SECTION 033760**

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# SECTION 036300 - EPOXY INJECTION SYSTEMS

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 SUMMARY

A. This Section includes the provision of all labor, materials, equipment, supervision and incidentals necessary to prepare cracks in structural concrete members and inject them with a 2-component, moisture-insensiteve, 100 percent solids, low-viscosity epoxy resin system.

B. Related Sections: Following Sections contain requirements that relate to this Section:

1. Division 01 Section "Submittal Procedures."
2. Division 02 Section "Work Items."
3. Division 02 Section "General Concrete Surface Preparation."
4. Division 02 Section "Surface Preparation for Patching."

### 1.3 QUALITY ASSURANCE

A. Testing Agency will be independent testing laboratory employed by Owner and approved by Engineer/Architect.

B. Testing Agency is responsible for conducting, monitoring and reporting to Owner results of all field tests of epoxy injection and installation required under this Section with copy of all reports to Engineer and Contractor.

C. Submit following information for Field Testing of Epoxy Injection Installation unless modified in writing by Engineer/Architect:

1. Project name and location.
2. Contractor's name.
3. Testing Agency's name, address and phone number.
4. Epoxy material supplier.
5. Date of report.
6. Testing Agency technician's name (sampling and testing).
7. Placement location within structure.
8. Epoxy material data:

    a. Epoxy type.

b. Gel type.
c. Width of cracks injected (if applicable).
d. Crack conditions (dry or wet).
e. Injection port spacing.
f. Initial and (if different) constant injection pressures.
g. Use rate of epoxy.

9. Weather data:

a. Air temperatures.
b. Weather.
c. Wind speed.

10. Field test data:

a. Date, time and place of test.
b. Thickness of epoxy in crack or void.

D. Qualifications:

1. Contractor Qualifications: Contractor shall be qualified in the field of concrete repair and protection with a minimum of 5 years experience in application of similar systems and products on projects of similar size and scope.

a. Successful completion of a minimum of 3 projects of similar size and complexity to specified Work.
b. Contractor shall maintain qualified personnel who have received product training by a manufacturer's representative.
c. Install materials in accordance with all safety and weather condtions required by the manufacturer, or as modified by applicable rules and regulations of local, state, and federal authorities having jurisdiction.

2. Manufacturer Qualifications: The manufacturer of the specified product shall be ISO 9001:2000 Certified and have in existence a recognized ongoing quality assurance program independently audited on a regular basis.The manufacturer shall have a minimum 15 years of experience in manufacturing of surface hardener.

E. Pre-Construction Meetings: Conduct Pre-Construction meeting at Project site to comply with requirements of Division 01 and as specified in this Section.

1. Schedule and convene meeting a minimum of 1 week prior to commencing Work of this Section.
2. Review requirements for application, including surface preparation specified under other Sections, substrate condition and pretreatment, minimum curing period, forecasted weather conditions, special details, installation procedures, testing and inspection procedures, protection, and repair.
3. Discuss procedures for protecting adjacent finished Work.

## 1.4 REFERENCES

A. "Standard Specifications for Structural Concrete," (ACI 301) by American Concrete Institute, herein referred to as ACI 301, is included in total as specification for this structure except as otherwise specified herein.

B. Comply with provisions of following codes, specifications and standards except where more stringent requirements are shown on Drawings or specified herein:

1. "Building Code Requirements for Reinforced Concrete," (ACI 318), American Concrete Institute, herein referred to as ACI 318.
2. "Causes, Evaluation, and Repair of Cracks in Concrete Structures" (ACI 224.112), American Concrete Institute.
3. "State-of-the-Art Report on Parking Structures" (ACI 362), American Concrete Institute.
4. ”Specification for Crack Repair by Epoxy Injection” (ACI 503.7), American Concrete Institute.
5. “Guide for the Application of Epoxy and Latex Adhesives for Bonding Freshly Mixed and Hardened Concretes”, (ACI 503.6), American Concrete Institute.
6. "Standard Specification for Bonding Hardened Concrete, Steel, Wood, Brick, and Other Materials to Hardened Concrete with a Multi-Component Epoxy Adhesive" (ACI 503.1), American Concrete Institute.
7. "Guide for Repair of Concrete Bridge Superstructures" Reported by ACI Committee 546 (ACI 546.1).

C. Contractor shall have following ACI/ICRI publications at Project construction site at all times:

1. ”Specification for Crack Repair by Epoxy Injection” (ACI 503.7), American Concrete Institute.” Structural Crack Repair by Epoxy Injection”, ACI RAP Bulletin 1, American Concrete Institute.
2. "Standard Specification for Bonding Hardened Concrete, Steel, Wood, Brick, and Other Materials to Hardened Concrete with a Multi-Component Epoxy Adhesive" (ACI 503.1), American Concrete Institute.

## 1.5 SUBMITTALS

A. Make submittals in accordance with requirements of Division 01 and as specified in this Section.

B. Contractor: Submit manufacturer's product data sheets, technical sheets, recommended application procedures and information on epoxy injection equipment.

C. Testing Agency: Promptly report all test results to Engineer/Architect and Contractor. Include following information:

1. See Article "Quality Assurance," paragraph "Submit following information for Field Testing...."
2. Visual examination of epoxy resin penetration.

D. See requirements of Division 01 Section, “Submittal Procedures,” Part 1 heading, “Submittal Procedures,” for limits to resubmittals.

E. See requirements of Division 01 Section, “Submittal Procedures,” Part 2 heading, “Requests for Information,” for RFI constraints.

## 1.6 WARRANTY

A. System manufacturer and Contractor shall furnish Owner written single source performance guarantee that epoxy resin injection system will be free of defects related to design, workmanship or material deficiency for 3-year period from date of acceptance of Work required under this Section against leakage or bond failure:

1. Any adhesive or cohesive failure.
2. Crazing or other weathering deficiency.
3. Normal abrasion or tear failure.

B. Any repair under this guarantee shall be done at no cost to Owner. Guarantee shall be provided by Contractor and manufacturer of system.

# PART 2 - PRODUCTS

## 2.1 MATERIALS AND EQUIPMENT

A. Injection epoxy shall be one of following:

1. "MasterInject 1380" or “MasterInject 1500” as manufactured by BASF Construction Chemicals., Shakopee, MN.
2. "Sikadur 35 Hi-Mod LV" or “Sikadur 52” as manufactured by Sika Chemical Corporation, Lyndhurst, NJ.
3. "Epoxy HP-LV" as manufactured by Hunt Process Corp-Southern, Ridgeland, MS.
4. “Pro-Poxy 50 Super LV” as manufactured by Unitex, Kansas City, MO.
5. “Eucopoxy” or “Duralcrete LV” as manufactured by The Euclid Chemical Company, Cleveland OH.
6. “Sure Inject J56 SLV” as manufactured by Dayton Superior Corp., Miamisburg OH.
7. “KonTek 11 LV” as manufactured by Contech Group, Inc. Seattle, WA.
8. “Kemko 038” as manufactured by ChemCo Systems, Inc., Redwood City, CA.

B. Epoxy gel shall be as specified by the selected injection epoxy manufacturer.

C. Equipment:

1. Epoxy injection unit shall be portable and equipped with positive displacement-type pumps with interlock to provide positive ration control of epoxy injection resin components. Pumps shall be air or electric powered and shall

provide in-line mixing and metering system and shall be equipped with drain-back plugs.

2. Equipment used to inject epoxy shall be capable of following:

    a. Automatic proportioning of materials within mix ratio tolerances set by epoxy resin manufacturer.
    b. Delivery of components, resin and hardeners, from separate reservoirs to mixing type discharge head.
    c. Complete and uniform mixing of components at discharge head.
    d. Injection of resin system at constant pressures not to exceed 150 psi.

## PART 3 - EXECUTION

### 3.1 PREPARATION

A. Crack Identification:

1. All cracks 0.03 in. wide or greater that are designated by Engineer/Architect, and not coincident with principal delamination, shall be injected. Cracks that occur coincident with principal delaminations shall not be injected.
2. Cracks requiring repair shall be located by Contractor at time of construction and marked with chalk.

B. Crack Preparation for Injection:

1. Surface of concrete adjacent to crack must be free of all laitance, efflorescence, dirt or foreign particles.
2. Cracks may be damp or dry as per injection material manufacturer's recommended installation procedures.
3. All cracks shall be properly sealed along their exposed length with an approved epoxy gel.
4. Epoxy injection ports shall be uniformly spaced along crack and shall be installed as recommended by system manufacturer. If concrete member being injected is exposed on both sides, provide injection ports on opposite sides at staggered intervals.
5. Apply epoxy gel around injection port to provide an adequate seal to prevent escape of injection resin from perimeter of port while under pressure.
6. Apply epoxy gel for sealing in manner that will result in minimal defacing or disorganization of concrete substrate.

### 3.2 INSTALLATION

A. Epoxy Injection:

1. Dispense epoxy injection under constant pressure in accordance with manufacturer’s recommended procedures or as required to achieve maximum filling and penetration of crack without inclusion of air voids in epoxy resin material.

2. Injection shall begin at lowest port and progress incrementally higher.
3. Appearance of epoxy resin at next higher port shall be considered evidence of successful crack filling.
4. If penetration of epoxy resin into cracks is not possible, notify Engineer/Architect prior to discontinuing injection procedures. If alternate injection procedures are possible, submit procedure in writing to Engineer/Architect for review.
5. Contractor shall adhere to all limitations and cautions for epoxy resin injection material as per manufacturer's current printed literature.

B. Cleaning:

1. When cracks are completely filled, allow adhesive to cure for sufficient time to allow the removal of the surface seal without any draining or runback of epoxy material from the cracks.
2. Remove the surface seal material, ports, and injection adhesive runs or spills from concrete surfaces.
3. Finish the face of the crack flush to the adjacent concrete, remmoving any indentations or protrusions caused by the placement of entry ports
4. Match work area to adjacent surface including any surface treatments.

## 3.3 FIELD QUALITY CONTROL BY TESTING AGENCY

A. Core Testing:

1. Testing Agency shall obtain 3- 2 in. minimum diameter core samples in first 100 ft of repaired cracks and 1 core for each 100 ft thereafter. Cores shall be taken after injection resin has cured for period of 7 days. Core sample shall be for full crack depth. Core locations and sizes shall be submitted to Engineer/Architect for review prior to taking core samples. Care should be taken not to damage or cut existing reinforcement (ESPECIALLY POST-TENSIONING TENDONS).
2. Core samples shall be visually examined to determine degree of epoxy penetration. Minimum of 90% of crack shall be full of epoxy adhesive.

B. Evaluation and Acceptance of Epoxy Injection:

1. Results of visual examination will be reviewed by Engineer/Architect for compliance with Article "Field Quality Control by Testing Agency," paragraph "Core Testing."
2. If results of initial cores fail by lack of penetration, work shall not proceed further until area represented by cores has been re-injected and re-tested for acceptance.
3. After cracks have been re-injected, additional cores shall be taken as directed by Engineer/Architect. Cores shall be tested for compliance with Article "Field Quality Control by Testing Agency," paragraph "Core Testing" by Owner's Testing Agency at Contractor's expense.
4. Core holes shall be filled with non-shrink grout material. Grout shall be applied with hard trowel, and be thoroughly rodded and tamped in place. Finish, texture and color to match existing surface. Materials and procedures for filling testing

core holes shall be submitted to Engineer/Architect for review prior to starting work.

C. Acceptance of Structure:

1. Acceptance of completed concrete injection work will be according to requirements of Article "Field Quality Control by Testing Agency," paragraph "Core Testing."
2. Grouted core holes shall be sounded by Engineer/Architect and Contractor with hammer or rod after curing for 48 hours.

**END OF SECTION 036300**

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# SECTION 071800 – TRAFFIC COATINGS

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 SUMMARY

A. A single installer shall be responsible for providing complete water proofing system including all products specified in following Sections:

1. Division 07 Section, “Traffic Coatings”
2. Division 07 Section, “Joint Sealants”

B. This Section includes traffic coating: Fluid applied, waterproofing, traffic-bearing elastomeric membrane with integral wearing surface, where surface to which membrane is to be applied is one or more of following as detailed on Drawings:

1. Above electrical room.

C. Materials shall be compatible with materials or related Work with which they come into contact, and with materials covered by this Section.

D. Related Sections: Following Sections contain requirements that relate to this Section.

1. Division 03 Section, "Prepackaged Repair Mortar."
2. Division 07 Section, “Concrete Joint Sealants”
3. Division 09 Section, "Pavement Markings -Restoration."

### 1.3 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Distribute reviewed submittals to all others whose Work is related.

B. Pre-installation Conference: Meet at project site well in advance of time scheduled for Work to proceed to review requirements for Work and conditions that could interfere with successful coating performance. Require every party concerned with coating Work, or required to coordinate with it or protect it thereafter, to attend. Include manufacturer's technical representative and warranty officer.

C. Make submittals in accordance with requirements of Division 01 Section, “Submittal Procedures:”

1. See requirements of Division 01 Section, “Submittal Procedures,” Part 1 heading, “Submittal Procedures,” for limits to resubmittals.
2. See requirements of Division 01 Section, “Submittal Procedures,” Part 2 heading, “Requests for Information,” for RFI constraints.

D. Submittals and Resubmittals: Engineer will review each of Contractor’s shop drawings and/or submittal data initial time and, should resubmittal be required, one additional time to verify that reasons for resubmittal have been addressed by Contractor and corrections made. Resubmittal changes/revisions/corrections shall be circled. Engineer will review only circled items and will not be responsible for non-circled changes / revisions / corrections and additions. Should additional resubmittals be required, Contractor shall reimburse Owner for all costs incurred, including cost of Engineer’s services made necessary to review such additional resubmittals. Owner shall in turn reimburse Engineer.

E. Requests For Information

1. Engineer reserves right to reject, unprocessed, any Request for Information (RFI) that Engineer, at its sole discretion, deems frivolous and/or deems already answered in the Contract Documents.
2. RFI process shall not be used for requesting substitutions. Procedures for substitutions are clearly specified elsewhere in Contract documents.

## 1.4 ACTION SUBMITTALS

A. Product Data: For each system indicated, submit the following at least 60 days prior to application.

1. Product description, technical data, appropriate applications and limitations.
2. Primer type and application rate
3. Material, and wet mils required to obtain specified dry thickness for each coat.
4. Type, gradation and aggregate loading required within each coat.

B. Samples:

1. One 4 in. by 4 in. stepped sample showing each component for each system indicated.

C. Sample Warranty: For each system indicated.

## 1.5 INFORMATION SUBMITTALS

A. Certificates

1. Certification that products and installation comply with applicable federal, state where project is located, and local EPA, OSHA and VOC requirements regarding health and safety hazards.

2. Evidence of applicator's being certified by manufacturer. Evidence shall include complete copy of manufacturer's licensing/certification document, spelling out repair responsibility for warranty claims.
3. Certification from Manufacturer that finishes as specified are acceptable for system to be installed at least 1 month before placement of any concrete which will receive traffic coating.
4. Certification stating static coefficient of friction meets minimum requirements of Americans with Disabilities Act (ADA).
5. Certification stating materials have been tested and listed for UL 790 Class "A" rated materials/system by UL for traffic coating application specified on project. Containers shall bear UL labels.
6. Certification from manufacturer confirming compatibility with existing underlying coatings and/or substrate.

B. Manufacturer's Instructions: for each system indicated.

1. Crack treatment and surface preparation method and acceptance criteria.
2. Method of application of each coat.
3. Maximum and minimum allowable times between coats.
4. Final cure time before resumption of parking and/or paint striping.
5. Any other special instructions required to ensure proper installation.

C. Field Quality Control:

1. Quality Control Plan as defined in Part 3.
2. Two copies each of manufacturer's technical representative's log for each visit.
3. Testing agency field reports.

D. Qualification Statements

1. Manufacturer's qualifications as defined in "Quality Assurance" article.
2. Installer's qualifications as defined in "Quality Assurance" article.
3. Signed statement from applicator certifying that applicator has read, understood, and shall comply with all requirements of this Section.

## 1.6 CLOSEOUT SUBMITTALS

A. Three copies of System Maintenance Manual.

B. Final executed Warranty.

## 1.7 QUALITY ASSURANCE

A. Manufacturer's Qualifications: Owner retains right to reject any manufacturer.

1. Evidence of acceptable previous work on WALKER-designed projects. If none, so state.
2. Evidence of financial stability acceptable to Engineer/Architect.

3. Listing of 20 or more projects completed with submitted system, to include:

    a. Name and location of project.
    b. Type of system applied.
    c. On-Site contact with phone number.

B. Manufacturer's technical representative, acceptable to Engineer/Architect, shall be on site during surface preparation and initial stages of installation.

C. Installer’s Qualifications: Owner retains right to reject any manufacturer.

1. Evidence of compliance with Summary article paragraph "A single installer. . ."
2. Evidence that installer has successfully performed or has qualified staff who have successfully performed at least 5 verifiable years of installations similar to those involved in this Contract, and minimum 10 projects with submitted system.
3. Listing of 5 or more installations in climate and size similar to this Project performed by installer’s superintendent.

D. Testing Agency: Independent testing laboratory employed by Contractor and acceptable to Engineer/Architect.

E. Certifications

1. Traffic coating shall satisfy current National Volatile Organic Compound (VOC) Emission Standards for Architectural Coatings.
2. Licensing/certification document from manufacturer that confirms system installer is a licensed/certified applicator for the manufacturer and is legally licensed to perform work in the state this project is being constructed.
3. Licensing/certification agreement shall include following information:

    a. Applicator’s financial responsibility for warranty burden under agreement terms.
    b. Manufacturer’s financial responsibility for warranty burden under agreement terms.
    c. Process for dispute settlement between manufacturer and applicator in case of system failures where cause is not evident or cannot be assigned.
    d. Authorized signatures for both Applicator Company and Manufacturer.
    e. Commencement date of agreement and expiration date (if applicable).

## 1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver all materials to site in original, unopened containers, bearing following information:

1. Name of product.
2. Name of manufacturer.
3. Date of preparation.
4. Lot or batch number.

B. Store materials under cover and protect from weather. Replace packages or materials showing any signs of damage with new material at no additional cost to Owner.

C. Do not store material on slabs to be post-tensioned before final post-tensioning of slabs is accomplished. At no time shall weight of stored material being placed on slab area, after post-tensioning is completed and concrete has reached specified 28 day strength, exceed total design load of slab area. Between time final post-tensioning is accomplished and time concrete has reached specified 28 day strength, weight of stored material placed on slab area shall not exceed half total design load of slab area.

## 1.9 FIELD CONDITIONS

A. Weather and Substrate Conditions: Proceed with work only when existing and forecast weather and temperature of concrete substrate will permit work in accordance with manufacturer's recommendations.

## 1.10 WARRANTY

A. System Manufacturer **(**New Application and Complete System Recoating**)**: Furnish Owner with written total responsibility Joint and Several Warranty, detailing responsibilities of manufacturer and applicator with regard to warranty requirements (Joint and Several). Warranty shall provide that system will be free of defects, water penetration and chemical damage related to system design, workmanship or material deficiency, consisting of:

1. Any adhesive or cohesive failures.
2. Spalling surfaces.
3. Weathering.
4. Surface crazing (does not apply to traffic coating protection course).
5. Abrasion or tear failure resulting from normal traffic use.
6. Failure to bridge cracks less than 0.0625 in. or cracks existing at time of traffic coating installation on double tees only.

B. If material surface shows any of defects listed above, supply labor and material to repair all defective areas and to repaint all damaged line stripes.

C. Warranty period shall be a 5 year Joint and Several Warranty commencing with date of acceptance of work.

D. Perform any repair under this warranty at no cost to Owner.

E. Address following in terms of Warranty: length of warranty, change in value of warranty – if any- based on length of remaining warranty period, transferability of warranty, responsibilities of each party, notification procedures, dispute resolution procedures, and limitations of liability for direct and consequential damages.

F. Vandalism, and abnormally abrasive maintenance equipment are not normal traffic use and are exempted from warranty.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

A. Manufacturer: Subject to compliance with requirements, provide products of 1 of following, only where specifically named in product category:

1. Advanced Polymer Technology (APT), Harmony, PA
2. BASF Building Systems (BASF), Shakopee, MN
3. Deneef Construction Chemicals (Deneef), Houston, TX.
4. Lymtal International Inc. (Lymtal), Lake Orion, MI.
5. Neogard Division of Jones-Blair Company (Neogard), Dallas, TX.
6. Pacific Polymers, Inc. a Division of ITW (Pacific Polymers), Garden Grove, CA
7. Poly-Carb Inc. (Poly-Carb), Twinsburg, OH.
8. Polycoat Products Division of Amer. Polymers (Polycoat), Santa Fe Springs, CA.
9. Pecora Corporation (Pecora), Harleysville, PA
10. Sika Corporation (Sika), Lyndhurst, NJ.
11. Technical Barrier Systems, Inc. (TBS), Oakville, Ontario.
12. Tremco (Tremco), Cleveland, OH.

### 2.2 MATERIALS, TRAFFIC COATING

A. Acceptable low odor coatings are listed below. Coatings shall be compatible with all other materials in this Section and related work.

1. VOC Compliant, Extreme Low Odor, High-Solids, Fast Cure, Heavy Duty Coating System:

    a. AutoGard FC HD-48, Autogard E, Neogard.
    b. Flexodeck Mark 170.2, Poly-Carb.
    c. Iso-Flex 760 U HL AR and 760 U HL AL, Lymtal.
    d. Kelmar FCW III, Exposure 3, TBS.
    e. MasterSeal Traffic 2500, BASF.
    f. Qualideck Heavy Vehicular (152/252/372/512), APT
    g. Sikalastic 720/745, Sika.
    h. Vulkem 360NF/950NF and 951NF, Tremco.

B. Provide ultraviolet screening for all traffic coating placed on this project.

C. Finish top coat shall be colored grey.

D. Substitutions: **None** for this project. Contact Engineer/Architect for consideration for future projects.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

A. Examine surfaces to receive Work and report immediately in writing to Engineer/Architect any deficiencies in surface which render it unsuitable for proper execution of Work.

B. Coordinate and verify that related Work meets following requirements before beginning surface preparation and application:

1. Concrete surfaces are finished as acceptable for system to be installed. Correct all high points, ridges, and other defects in a manner acceptable to Engineer/Architect.
2. Curing compounds used on concrete surfaces are compatible with system to be installed.
3. Concrete surfaces have completed proper curing period for system selected.
4. Joint Sealants are compatible with traffic coatings.

### 3.2 PREPARATION

A. Seal all openings to occupied space to prevent cleaning materials, solvents and fumes from infiltration. All protective measures and/or ventilating systems required to prevent infiltration are incidental to this Work.

B. Acid etching is prohibited.

C. Remove all debonded traffic coatings. Remove all laitance and surface contaminants, including oil, grease and dirt, by shotblasting and appropriate degreasers, or as specified by manufacturer’s written recommendations to provide warranty.

D. Before applying materials, apply system to small area to assure that it will adhere to substrate and joint sealants and dry properly and to evaluate appearance.

E. All random cracks on concrete surface less than 0.03 in. wide and showing no evidence of water and/or salt water staining on ceiling below shall receive detail coat unless more complete treatment required in accordance with manufacturer's recommendations. Rout and seal random cracks, construction joints and control joints prior to installation of primer or base coat. Crack preparation including installation of joint sealant material, where required, is incidental to traffic coating work.

F. Mask off adjoining surfaces not to receive traffic coating and mask off drains to prevent spillage and migration of liquid materials outside membrane area. Provide neat/straight lines at termination of traffic coating.

## 3.3 INSTALLATION/APPLICATION

A. Installation should include all of the following steps:

1. Surface Preparation: Prepare concrete for system application.
2. Crack/Construction/Control/Cove Joint Sealing: Detail for crack bridging.
3. Primer Coat: Insure proper adhesion of membrane to substrate.
4. Base Coat: Provide crack spanning in conjunction with Crack Detail noted above.
5. Aggregate Coat – to hold aggregate in system, providing skid and wear close up resistance.
6. Aggregate: Correct size, shape, hardness and amount necessary to insure proper skid and wear resistance.
7. Top Coat: Lock aggregate into place, provide a maintainable surface and provide resistance to ponding water, UV degradation, color loss and chemical intrusion.

B. Do all Work in accordance with manufacturer's written instructions and specifications including, but not limited to, moisture content of substrate, atmospheric conditions (including relative humidity and temperature), coverages, mil thicknesses and texture, and as shown on Drawings.

C. A primer coat is required for all systems. No exception.

D. Do not apply traffic coating material until concrete has been air dried at temperatures at or above 40ºF for at least 30 days after curing period specified.

E. Cease material installation under adverse weather conditions, or when temperatures are outside manufacturer's recommended limitations for installation, or when temperature of work area or substrate are below 40ºF.

F. All adjacent vertical surfaces shall be coated with traffic coating minimum of 4 in. above coated horizontal surface. Requirement includes, but is not limited to pipes, columns, walls, curbs (full height of vertical faces of all curbs) and islands.

G. Complete all Work under this Section before painting line stripes.

H. Clean off excess material and material smears adjacent to joints as work progresses using methods and materials approved by manufacturers.

## 3.4 FIELD QUALITY CONTROL

A. Develop a quality control plan for assured specified uniform membrane thickness that utilizes grid system of sufficiently small size to designate coverage area of not more than 5 gallons at specified thickness. In addition, employ wet mil gauge to continuously monitor thickness during application. Average specified wet mil thickness shall be maintained within grid during application with minimum thickness of not less than 80% of average acceptable thickness. Immediately apply more material to any area not maintaining these standards.

B. Testing Agency employ wet mil gauge to periodically monitor thickness during application.

C. Install 1 trial section of coating system for each duty grade specified. Do not proceed with further coating application until trial sections accepted in writing by Engineer/Architect. Remove and replace rejected trial sections with acceptable application. Trial section shall also be tested for:

1. Wet mil thickness application.
2. Adhesion to concrete substrate.
3. Overall dry mil thickness.

D. Use trial sections to determine adequacy of pre-application surface cleaning. Obtain Owner, Engineer/Architect and manufacturer acceptance of:

1. Cleaning before proceeding with traffic coating application.
2. Visual appearance of finished coating application.
3. Conformance to ADA static coefficient of friction.
4. Elcometer or equivalent pull test to quantify traffic coating adhesion to concrete and existing traffic coating.

E. Determine overall coating system mil thickness:

1. Contractor shall provide 6 in. by 6 in. bond breaker (coating coupon) on concrete surface for each 25,000 sq ft, or fraction thereof, of coating to be placed as directed by Engineer/Architect and manufacturer. Dimensionally locate coupon for easy removal.
2. Contractor shall assist Testing Agency in removing coating coupons from concrete surface at completion of manufacturer-specified cure period. Contractor shall repair coupon area per coating manufacturer's instructions.
3. Testing Agency shall determine dry mil thickness of completed Traffic Coating System, including bond breaker. Take 9 readings (minimum), 3 by 3 pattern at 2 in. on center. No reading shall be taken closer than 1 in. from coupon edge. Report individual readings and overall coating system average to Engineer/Architect. Readings shall be made with micrometer or optical comparator.

**END OF SECTION 071800**

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# SECTION 071900 – WATER REPELLENTS

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 SUMMARY

A. A single installer shall be responsible for providing complete water proofing system including all products specified in the following Sections:

1. Division 03 Section, “Prepackaged Repair Mortar”
2. Division 07 Section, “Traffic Coatings”
3. Division 07 Section, “Water Repellents”
4. Division 07 Section, “Concrete Joint Sealants”
5. Division 07 Section, “Expansion Joint Assemblies”

B. This Section includes penetrating concrete sealer on these surfaces:

1. Supported concrete floor and concrete roof surfaces including curbs, walks, islands and pour strips.
2. Concrete stair treads and landings.

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

1. Division 02 Section, “Work Items.”
2. Division 03 Section, “Cast-in-Place Concrete - Restoration”
3. Division 07 Section, “Traffic Coatings”
4. Division 07 Section, “Concrete Joint Sealants”
5. Division 07 Section, “Expansion Joint Assemblies”
6. Division 09 Section, "Pavement Markings."

### 1.3 REFERENCES

A. ASTM International (ASTM):

1. ASTM D6489, “Standard Test Method for Determining the Water Absorption of Hardened Concrete Treated with a Water Repellent Coating.”

## 1.4 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Materials shall be compatible with materials or related Work with which they come into contact, and with materials covered by this Section.
2. Distribute reviewed submittals to all others whose Work is related.

B. Make submittals in accordance with requirements of Division 01 Section, “Submittal Procedures:”

1. See requirements of Division 01 Section, “Submittal Procedures,” Part 1 heading, “Submittal Procedures,” for limits to resubmittals.
2. See requirements of Division 01 Section, “Submittal Procedures,” Part 2 heading, “Requests for Information,” for RFI constraints.

## 1.5 ACTION SUBMITTALS

A. Product Data: For each type of product indicated at least 60 days prior to application.

1. Product description, technical data, appropriate applications, and limitations.
2. Areas and application rates of materials to be applied.
3. Proposed alternate application methods, if any.

## 1.6 INFORMATION SUBMITTALS

A. Certificates

1. Certification that products and installation comply with applicable federal, state of Georgia, and local EPA, OSHA and VOC requirements regarding health and safety hazards.
2. Evidence of applicator's being certified by manufacturer. Evidence shall include complete copy of manufacturer’s licensing/certification document, spelling out repair responsibility for warranty claims.

B. Field Quality Control

1. ASTM D6489 Test Results
2. Two copies of manufacturer's technical representative's log for each visit.

C. Qualification Statements

1. Manufacturer’s qualifications as defined in the “Quality Assurance” article.
2. Installer’s qualifications as defined in the “Quality Assurance” article.
3. Signed statement from applicator certifying that applicator has read, understood, and shall comply with all requirements of this Section.

## 1.7 QUALITY ASSURANCE

A. Manufacturer's Qualifications: Owner retains right to reject any manufacturer.

1. Evidence of acceptable previous work on WALKER-designed projects. If none, so state.
2. Evidence of financial stability acceptable to Engineer/Architect.
3. Listing of 20 or more projects completed with submitted system, to include:

    a. Name and location of project.
    b. Type of system applied.
    c. On-Site contact with phone number.

B. Installer's Qualifications: Owner retains right to reject any installer.

1. Evidence of compliance with Summary article paragraph "A single installer. . ."
2. Evidence that installer has successfully performed or has qualified staff who have successfully performed at least 5 verifiable years of installations similar to those involved in this Contract, and minimum 10 projects with submitted system.
3. Listing of 5 or more installations in climate and size similar to this Project performed by installer's superintendent.

C. Testing Agency: Independent testing laboratory employed by Owner or Construction Manager and acceptable to Engineer/Architect.

D. Certifications

1. Sealer shall satisfy the current national and local Volatile Organic Compound (VOC) Emission Standards for Architectural Coatings.
2. Licensing/certification document from system manufacturer that confirms system installer is a licensed/certified applicator for the manufacturer and is legally licensed to perform work in the state of Georgia.
3. Licensing/certification agreement must provide following information:

    a. Applicator's financial responsibility for warranty burden under agreement terms.
    b. Manufacturer's financial responsibility for warranty burden under agreement terms.
    c. Process for dispute settlement between manufacturer and applicator in case of system failures where cause is not evident or cannot be assigned.
    d. Officers' signatures for both Applicator Company and Manufacturer.
    e. Commencement date of agreement and expiration date (if applicable).

## 1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver all materials to site in original, unopened containers, bearing following information:

1. Name of product.

2. Name of manufacturer.
3. Date of preparation.
4. Lot or batch number.

B. Store materials under cover and protect from weather. Replace packages or materials showing any signs of damage with new material at no additional cost to Owner.

## 1.9 FIELD CONDITIONS

A. Weather and Substrate Conditions: Do not proceed with application (except with written recommendation of manufacturer) under any of the following conditions:

1. Ambient temperature is less than 40º F.
2. Substrate surfaces have cured for less than 1 month.
3. Rain or temperatures below 40º F predicted for a period of 24 hours.
4. Less than 24 hours after surfaces became wet.
5. Substrate is frozen or surface temperature is less than 40º F.
6. Wind velocities higher than manufacturer's specified limit to prevent solvent flash-off.

# PART 2 - PRODUCTS

## 2.1 MANUFACTURERS

A. Manufacturer: Subject to compliance with requirements, provide products of one of following, only where specifically named in product category:

1. Advanced Chemical Technologies Inc. (ACT), Oklahoma City, OK.
2. BASF Building Systems (BASF), Shakopee, MN.
3. Deneef Construction Chemicals (Deneef), Houston, TX.
4. Evonik Degussa Corporation (Evonik Degussa), Parsippany, NJ.
5. Euclid Chemical Company (Euclid), Cleveland, OH.
6. Lymtal International Inc. (Lymtal), Lake Orion, MI.
7. Prosoco, Inc. (Prosoco), Lawrence, KS
8. Sika Corporation (Sika), Lyndhurst, NJ.

## 2.2 MATERIALS, CONCRETE SEALER

A. Silane (90% or greater solids, 400 g/L or less VOC):

1. MasterProtect H 1000, 200 sf/g, BASF.
2. Iso-Flex 618-100 CRS, 200 sf/g, Lymtal.
3. Protectosil BHN, 200 sf/g, Evonik Degussa Corp.
4. Sikagard 705L ,200 sf/g, Sika.
5. Sil-Act ATS-100 LV, 200 sf/g, ACT.

B. Proposed substitutions: None for this project. Contact Engineer/Architect for consideration for future projects.

## 2.3 MATERIALS, CRACK SEALER

A. Repair for isolated random horizontal cracks 0.01 in. to 0.06 in. wide. Acceptable products:

1. SikaPronto 19TF, Sika.
2. Sikadur 55 SLV Epoxy Crack Healer/Sealer, Sika.
3. MasterSeal 630, BASF.
4. Denedeck Crack Sealer, Deneef.
5. Iso-Flex 609 Epoxy Crack Sealer, Lymtal.

# PART 3 - EXECUTION

## 3.1 EXAMINATION

A. Examine surfaces to receive Work and report immediately in writing to Engineer/Architect any deficiencies in surface which render it unsuitable for proper execution of Work.

B. Coordinate and verify that related Work meets following requirements before beginning surface preparation and application:

1. Concrete surface finishes are acceptable for system to be installed.
2. Curing compounds used on concrete surfaces are compatible with system to be installed.
3. Concrete surfaces have completed proper curing period for system selected.
4. Control joint and expansion joint Work is complete and has been accepted by Engineer/Architect.

## 3.2 PREPARATION

A. Seal all openings to occupied space to prevent cleaning materials, solvents and fumes from infiltration. All protective measures and/or ventilating systems required to prevent infiltration are incidental to this Work.

B. Acid etching is prohibited.

C. Repair or replace all sealant materials damaged by surface preparation operations.

D. Shot blast clean all surfaces to be sealed as acceptable to sealer manufacturer before sealer application. Shot blasting is not recommended or required for new slabs that are water cured per ACI 308, Paragraph 2.2. Cleaning method and materials shall be

sufficient to allow absorption criteria stated in Field Quality Control article to be met. Prepare by sandblasting all surfaces inaccessible to shotblast equipment.

E. Equipment used during floor slab cleaning shall not exceed height limitation of facility and shall not exceed 3,000 lb axle load or vehicle gross weight of 6,000 lb.

F. Mask off adjoining surfaces not to receive sealer and mask off drains to prevent spillage and migration of liquid materials outside sealer area. Provide neat/straight lines at termination of sealer.

## 3.3 INSTALLATION/APPLICATION

A. Do all Work in accordance with manufacturer's written instructions and specifications including, but not limited to, moisture content of substrate, atmospheric conditions (including relative humidity and temperature), coverage, mil thickness and texture, and as shown on Drawings.

B. Clean all surfaces affected by sealer material overspray and repair all damage caused by sealer material overspray to adjacent construction or property at no cost to Owner.

C. Clean off excess material as work progresses using methods and materials approved by manufacturer.

## 3.4 FIELD QUALITY CONTROL

A. Install 3 trial sections of sealer to verify treated surface is not glazing as result of sealer application. If application of sealer causes glazing at trial section, contact sealer manufacturer to obtain written recommendations for solving problem. Do not proceed with sealer application following trial section applications until directed to do so in writing by Engineer/Architect.

## 3.5 NON-CONFORMING WORK

A. Unsatisfactory Field Quality Control test results shall be grounds for rejection of sealer or sealer application rate. Perform sealer reapplication at no additional cost to Owner.

**END OF SECTION 071900**

# SECTION 079233 – CONCRETE JOINT SEALANTS

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 SUMMARY

A. A single installer shall be responsible for providing complete water proofing system including all products specified in the following Sections:

1. Division 07 Section, “Water Repellents”
2. Division 07 Section, “Concrete Joint Sealants”
3. Division 07 Section, “Expansion Joint Assemblies”

B. This Section includes the following:

1. Exterior joints in the following horizontal traffic bearing surfaces and as shown on the drawings:

a. Routed random cracks.
b. Existing construction joints.
c. Cove joint sealants between horizontal and vertical surface.
d. Brick and masonry joints.

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

1. Division 03 Section, "Trowel Applied Mortar."
2. Division 07 Section, “Water Repellents.”
3. Division 07 Section, “Expansion Joint Assemblies.”
4. Division 09 Section, "Pavement Markings."

### 1.3 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Materials shall be compatible with materials or related Work with which they come into contact, and with materials covered by this Section.
2. Distribute reviewed submittals to all others whose Work is related.

B. Make submittals in accordance with requirements of Division 01 Section 013300, “Submittal Procedures:”

1. See requirements of Division 01 Section, “Submittal Procedures,” Part 1 heading, “Submittal Procedures,” for limits to resubmittals.
2. See requirements of Division 01 Section, “Submittal Procedures,” Part 2 heading, “Requests for Information,” for RFI constraints.

C. Pre-installation Conference: Meet at project site well in advance of time scheduled for Work to proceed to review requirements for Work and conditions that could interfere with successful sealant performance. Require every party concerned with sealant Work, or required to coordinate with it or protect it thereafter, to attend. This includes but is not limited to manufacturer’s technical representative, warranty officer, Engineer, Owner, contractor’s superintendent, and contractor’s employee’s that will be performing the work.

## 1.4 ACTION SUBMITTALS

A. Product Data: For each system indicated at least 10 days prior to application.

1. Product description, technical data, appropriate applications and limitations.
2. Primer type and application rate

B. Samples:

1. If requested, one for each system indicated.

## 1.5 INFORMATION SUBMITTALS

A. Certificates:

1. Evidence of installer's being certified by manufacturer. Evidence shall include complete copy of manufacturer’s licensing/certification document, spelling out repair responsibility for warranty claims.
2. Certification from the Manufacturer that joint details as specified are acceptable for system to be installed at least 1 month before placement of any concrete which will receive joint sealant.

B. Field Quality Control:

1. Testing agency field and test reports.

C. Qualification Statements:

1. Manufacturer’s qualifications as defined in the “Quality Assurance” article.
2. Installer’s qualifications as defined in the “Quality Assurance” article.
3. Signed statement from this Section applicator certifying that applicator has read, understood, and shall comply with all requirements of this Section.

## 1.6 CLOSEOUT SUBMITTALS

A. Final executed Warranty.

## 1.7 QUALITY ASSURANCE

A. Manufacturer’s Qualifications: Owner retains right to reject any manufacturer.

1. Evidence of acceptable previous work on WALKER-designed projects. If none, so state.
2. Evidence of financial stability acceptable to Engineer.
3. Listing of 5 or more projects completed with submitted system, to include:

    a. Name and location of project.
    b. Type of system applied.
    c. On-Site contact with phone number.

B. Manufacturer's technical representative, acceptable to Engineer, shall be on site during surface preparation and initial stages of installation.

C. Installer’s Qualifications: Owner retains right to reject any manufacturer.

1. Evidence of compliance with Summary article paragraph "A single installer. . ."
2. Evidence that installer has successfully performed or has qualified staff who have successfully performed at least 5 verifiable years of installations similar to those involved in this Contract, and minimum 5 projects with submitted system.
3. Listing of 5 or more installations in climate and size similar to this Project performed by installer’s superintendent.

D. Testing Agency: Independent testing laboratory employed by Contractor and acceptable to Engineer.

E. Certifications:

1. Licensing/certification document from system manufacturer that confirms system installer is a licensed/certified applicator for the manufacturer and is legally licensed to perform work in the state of Georgia.
2. Licensing/certification agreement shall include following information:

    a. Applicator’s financial responsibility for warranty burden under agreement terms.
    b. Manufacturer’s financial responsibility for warranty burden under agreement terms.
    c. Process for dispute settlement between manufacturer and applicator in case of system failures where cause is not evident or cannot be assigned.
    d. Authorized signatures for both Applicator Company and Manufacturer.
    e. Commencement date of agreement and expiration date (if applicable).

## 1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver all materials to site in original, unopened containers, bearing following information:

1. Name of product.
2. Name of manufacturer.
3. Date of preparation.
4. Lot or batch number.

B. Store materials under cover and protect from weather. Replace packages or materials showing any signs of damage with new material at no additional cost to Owner.

## 1.9 FIELD CONDITIONS

A. Weather and Substrate Conditions: Proceed with work only when existing and forecast weather and temperature of concrete substrate will permit work in accordance with manufacturer's recommendations.

## 1.10 WARRANTY

A. System Manufacturer: Furnish Owner with written total responsibility Joint and Several Warranty, detailing responsibilities of manufacturer and installer with regard to warranty requirements (Joint and Several). The warranty shall provide that system will be free of defects, water penetration and chemical damage related to system design, workmanship or material deficiency, consisting of:

1. Any adhesive or cohesive failures.
2. Weathering.
3. Abrasion or tear failure resulting from normal traffic use.

B. If material surface shows any of defects listed above, supply labor and material to repair all defective areas and to repaint all damaged line stripes.

C. Warranty period shall be a 5 year Joint and Several Warranty commencing with date of acceptance of work.

D. Perform any repair under this warranty at no cost to Owner.

E. Address the following in the terms of the Warranty: length of warranty, change in value of warranty – if any- based on length of remaining warranty period, transferability of warranty, responsibilities of each party, notification procedures, dispute resolution procedures, and limitations of liability for direct and consequential damages.

F. Vandalism, and abnormally abrasive maintenance equipment are not normal traffic use and are exempted from warranty.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

A. Manufacturer: Subject to compliance with requirements, provide products of 1 of following, only where specifically named in product category:

1. BASF Building Systems (BASF), Shakopee, MN.
2. Dow Corning Corp. (Dow Corning), Midland, MI.
3. Lymtal International Inc. (Lymtal), Lake Orion, MI.
4. Pecora Corporation (Pecora), Harleysville, PA.
5. Sika Corporation (Sika), North Canton, OH.
6. Sonneborn, a Division of BASF Construction Chemicals (BASF).
7. Tremco (Tremco), Cleveland, OH.

### 2.2 MATERIALS, JOINT SEALANT SYSTEM

A. Provide complete system of compatible materials designed by manufacturer to produce waterproof, traffic-bearing control joints as detailed on Drawings.

B. Compounds used for sealants shall not stain masonry or concrete. Aluminum pigmented compounds not acceptable.

C. Color of sealants shall match adjacent surfaces.

D. Closed cell or reticulated backer rods: Acceptable products:

1. “Sof Rod,” Nomaco Inc., 501 NMC Drive, Zebulon, NC 27597. (800) 345-7279 ext. 341.
2. “ITP Soft Type Backer Rod,” Industrial Thermo Polymers Limited, 2316 Delaware Ave., Suite 216, Buffalo, NY 14216. (800) 387-3847.
3. “Sonneborn Soft Type Backer Rod,” Sonneborn, Minneapolis, MN.

E. Bond breakers and fillers: as recommended by system manufacturer.

F. Primers: As recommended by sealant manufacturer.

G. Acceptable sealants are listed below. Sealants shall be compatible with all other materials in this Section and related work.

H. Acceptable polyurethane control joint sealants (traffic bearing):

1. MasterSeal SL-2 or MasterSeal SL-2 SG, BASF.
2. Iso-flex 880 GB or Iso-flex 881, Lymtal.
3. Dynatrol II-SG or Urexpan NR 200, Pecora.
4. Sikaflex-2c SL or Sikaflex-2c NS TG, Sika.
5. THC-900, THC-901, Vulkem 45SSL, Dymeric 240, Dymeric 240 FC or Dymonic 100, Tremco.

I. Acceptable polyurethane vertical and cove joints sealants (non-traffic bearing):

1. Sikaflex-2c NS, Sika.
2. Sonolastic NP-2, BASF.
3. Dymeric 240/240FC, Dymonic 100 or THC 901 (cove only), Tremco.
4. Dynatred, Pecora.
5. Iso-flex 881, Lymtal.

J. Acceptable silicone vertical and cove joint sealants (non-traffic bearing) at locations.

1. Spectrem 1 or Spectrem 4-TS, Tremco.
2. 311-NS, Pecora.
3. Dow Corning NS Parking Structure Sealant, Dow Corning.

K. Proposed Substitutions: **None** for this project. Contact Engineer for consideration for future projects.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

A. Examine surfaces to receive Work and report immediately in writing to Engineer any deficiencies in surface which render it unsuitable for proper execution of Work.

### 3.2 PREPARATION

A. Seal all openings to occupied space to prevent cleaning materials, solvents and fumes from infiltration. All protective measures and/or ventilating systems required to prevent infiltration are incidental to this Work.

B. Correct unsatisfactory conditions before installing sealant system.

C. Acid etching is prohibited.

D. Grind joint edges smooth and straight with beveled grinding wheel before sealing. All surfaces to receive sealant shall be dry and thoroughly cleaned of all loose particles, laitance, dirt, dust, oil, grease or other foreign matter. Obtain written approval of method from system manufacturer before beginning cleaning.

E. Check preparation of substrate for adhesion of sealant.

F. Prime and seal joints and protect as required until sealant is fully cured. A primer coat is required for all systems.

## 3.3 INSTALLATION/APPLICATION

A. Do all Work in strict accordance with manufacturer's written instructions and specifications including, but not limited to, moisture content of substrate, atmospheric conditions (including relative humidity and temperature), thicknesses and texture, and as shown on Drawings.

B. Completely fill joint without sagging or smearing onto adjacent surfaces.

C. Fill horizontal joints slightly recessed to avoid direct contact with wheel traffic.

D. Clean off excess material and material smears adjacent to joints as work progresses using methods and materials approved by manufacturers.

E. Cease material installation under adverse weather conditions, or when temperatures are outside manufacturer's recommended limitations for installation, or when temperature of work area or substrate are below 40ºF.

## 3.4 FIELD QUALITY CONTROL

A. Contractor and Engineer will jointly determine which one of following 2 methods of sealant testing to verify sealant profile:

1. Contractor, at Engineer's direction, shall cut out lesser of 1% of total lineal footage placed or total of 20 lineal ft of joint sealant at isolated/random locations (varying from in. to ft of material) for Engineer and Manufacturer's Representative inspection of sealant profile.
2. Contractor, at Engineer’s direction, shall install 3 trial joint sections of 20 ft each. Contractor shall cut out joint sections, as selected by Engineer, for Engineer and Manufacturer's Representative inspection. Additional isolated/random removals may be required where sealant appears deficient. Total cut out sealant shall not exceed lesser of 1% of total lineal footage placed or total of 20 lineal ft of joint sealant at isolated/random locations (varying from in. to ft of material) for Engineer and Manufacturer's Representative inspection of sealant profile.

B. Repair all random joint sealant "cut out" sections at no cost to Owner.

**END OF SECTION 079233**

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# SECTION 079500 – EXPANSION JOINT ASSEMBLIES

## 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. This Section includes the following:

1. Expansion joint systems for parking structure:

a. Adhered extruded rubber joint system
b. Field applied silicone sealant expansion joint at horizontal and vertical locations.

B. Contractor shall provide in writing the name of the proposed installer, manufacturer, and model of the expansion joint system at the time of bid submittal. See also additional submittal requirements for minimum experience record and qualifications for system. Single licensed installer shall be responsible for providing complete sealant, expansion joint, and waterproofing system designed to minimize occurrence of common sealant, expansion joint, waterproofing, and concrete deterioration problems. All measures called for in these Specifications will be rigorously enforced.

C. Contractor shall provide in writing the name of the proposed installer, manufacturer, and model of the expansion joint system at the time of bid submittal. See also additional submittal requirements for minimum experience record and qualifications for system. Single licensed installer shall be responsible for providing complete expansion joint system designed to minimize occurrence of common expansion joint, and concrete deterioration problems. All measures called for in these Specifications will be rigorously enforced.

D. Related Sections: The following Sections contain requirements that relate to this section:

1. Division 07 Section, “Water Repellents”
2. Division 07 Section, “Concrete Joint Sealants”
3. Division 09 Section “Pavement Markings”.

## 1.3 DEFINITIONS

A. Maximum Joint Width: Widest linear gap a joint system tolerates and in which it performs its designed function without damaging its functional capabilities.

B. Minimum Joint Width: Narrowest linear gap a joint system tolerates and in which it performs its designed function without damaging its functional capabilities.

C. Movement Capability: Value obtained from the difference between widest and narrowest widths of a joint opening typically expressed in numerical values (mm or inches) or a percentage (plus or minus) of nominal value of joint width. Movement capability is to include anticipated movements from concrete shrinkage, concrete shortening and creep from post-tensioning or prestessing, cyclic thermal movements, and seismic movements.

D. Nominal Joint Width: The width of the linear opening specified in practice and in which the joint system is installed.

E. Nominal Form Width: Linear gap in joint system at time of forming or erection of structural elements bounding the expansion joint.

## 1.4 PREQUALIFICATION OF INSTALLER AND MANUFACTURER

A. Prequalification of Bidders:

1. With Bid, submit evidence of qualifications.
2. Prequalification Criteria, all in writing:

    a. Evidence of compliance with Experience Record and Qualifications paragraph below.
    b. Evidence of acceptable previous work on WALKER-designed projects. If none, so state.
    c. Owner or Engineer/Architect retains absolutely, right to reject any prequalification statement.
    d. Copy of sample warranty.
    e. Evidence of financial stability acceptable to Owner or Engineer/Architect.

B. Experience record and qualifications:

1. Manufacturer's and installers experience shall include verification of 5 years experience and 5 verified projects completed with submitted system for similar applications. Verify projects completed with the system identifying the following: Name, date and location of project, system installed, on-site or owner contact and phone number.
2. Information shall be included with bid submission.
3. List Superintendent’s specific training/qualification.
4. Installer/Applicator training and qualification/certification by manufacturer.

C. Sample Labor and Material Warranty including all terms and conditions from manufacturer and installer.

1. Information shall be included with bid submission.
2. See Warranty requirements in Article “Warranty”.

## 1.5 SUBMITTALS

A. Submittals and Resubmittals: Engineer/Architect will review each of Contractor’s shop drawings and/or submittal data the initial time and, should resubmittal be required, one additional time to verify that reasons for resubmittal have been addressed by Contractor and corrections made. Resubmittal changes/revisions/corrections shall be circled. Engineer/Architect will review only circled items and will not be responsible for non-circled changes/revisions/corrections and additions.

B. Shop Drawings: Provide the following for each joint system specified:

1. Placement Drawings: Show project conditions including, but not limited to, line diagrams showing plans, elevations, sections, details, splices, blockout requirement, terminations, joint systems change planes, provide isometric or clearly detailed drawing depicting how components interconnect. Include reviewed and approved details from others whose work is related. Other information required to define joint placement or installation.

C. Warranty Requirements: System manufacturer shall submit written plan of the construction and coordination requirements to allow the manufacturer to proceed with installation of joints with the specified warranty. Submit to OWNER for acceptance 2 weeks prior to ordering materials for construction and specifically address the following:

1. Block out acceptance criteria.
2. Surface preparation acceptance criteria.
3. Crack, surface defect, and detailing recommendations.
4. Method of protection of surrounding surfaces.
5. Method of expansion joint system installation description.
6. Primer type and application rate.
7. Method of preparation of all glands and reinforced membranes.
8. Temperature, humidity and other weather constraints. Specify substrate moisture testing criteria, if any.
9. Final cure time before removal of protection, resumption of traffic, and/or paint striping.
10. Any other special instructions required to ensure proper installation.
11. Quality Service Requirements:

a. Show evidence of licensed/approved installer. List of names, addresses and phone numbers, with copies of certification/approval agreement with each, satisfies requirement. Licensing/certification agreement shall include following information:

1) Installer's financial responsibility for warranty burden under agreement terms.
2) Manufacturer's financial responsibility for warranty burden under agreement terms.
3) Process for dispute settlement between manufacturer and installer in case of system failures where cause is not evident or cannot be assigned.
4) Authorized signatures for both Installer Company and Manufacturer.
5) Commencement date of agreement and expiration date (if applicable).

b. Provide copy of contractor's field application quality control procedures.
c. Installer shall show evidence of minimum 5 projects completed by installer over previous 5 years using submitted system, or similar system.

D. Evidence of manufacturer's certification of installer/applicator. Evidence shall include complete copy of manufacturer's licensing/certification document, spelling out repair responsibility for warranty claims.

E. Signed statement from installer/applicator certifying that installer/applicator has read, understood, and shall comply with all requirements of this Section

F. Signed statement from manufacturer's representative that they have read, understood, and shall comply with all requirements of this section.

G. Two copies each of manufacturer's technical representative's log for each visit.

H. Samples for each type of joint system indicated.

1. Submit 2 samples for each type. Full width by 6 inches (150 mm) long, for each system required.
2. Field samples of premolded joint sealant. Width, thickness and durometer hardness of sealant shall be checked by Testing Agency. Upward buckling caused by joint gap closure shall be limited to a maximum of ¼ inch per ADA Guidelines.

I. Other information required to define joint placement or installation.

J. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for current products.

K. ADA Certification: Prior to installation, submit written certification from manufacturer indicating that expansion joints conform to Americans with Disabilities Accessibility Guidelines for Buildings and Facilities, as published by U.S. Architectural & Transportation Barriers Compliance Board, 1331 F Street, N.W., Suite 1000, Washington, DC 20004-1111. 1-800-872-2253.

1. Submit test reports from accredited laboratory attesting to joint systems' movement capability and ADA compliance.

2. Static coefficient of friction shall meet minimum requirements of Americans with Disabilities Act (ADA).

L. Maintenance Manual: Submit 3 copies of System Maintenance Manual.

M. Certification that products and installation comply with applicable federal, state of Georgia, and local EPA, OSHA and VOC requirements regarding health and safety hazards.

## 1.6 QUALITY ASSURANCE

A. Testing Agency: Independent testing laboratory employed by Owner and acceptable to Engineer/Architect.

B. Installer Qualifications: An employer of workers trained and approved by manufacturer.

C. Source Limitations: A single Installer shall be responsible for providing complete expansion joint system. Obtain joint systems through one source from a single manufacturer.

D. Product Options: Drawings indicate size, profiles, and dimensional requirements of joint systems and are schematic for systems indicated in Part 2.

1. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.
2. Refer to Division 01 Section "Product Requirements."

E. Walking Surfaces: Expansion joint assemblies at walking areas subject to pedestrian traffic shall provide a smooth, slip resistant walking surface for pedestrians with these minimum requirements:

1. Shall provide walking surfaces in accordance with ASTM – F 1637 Standard Practice for Safe Walking Surfaces.
2. Shall be designed to comply with “Americans with Disabilities Act (ADA), Accessibility Guidelines (ADAAG)” and ICC A117.1. Americans with Disabilities Accessibility Guidelines for Buildings and Facilities, as published by U.S. Architectural & Transportation Barriers Compliance Board, 1331 F Street, N.W., Suite 1000, Washington, DC 20004-1111. 1–800-872-2253.
3. Adjoining walkway surfaces shall be flush and meet the following minimum requirements:

    a. Changes in level of less than ¼ inch in height may be without edge treatment as shown in ADA Figure 303.2 and on the Drawings.
    b. Changes in Level between ¼ inch and ½ inch in height shall be beveled with a slope no greater than 1:2 as shown in ADA Figure 303.3 and on the Drawings.

c. Changes in level greater than ½ inch in height are not permitted unless they can be transitioned by means of a ramp as shown on Drawings.
d. Openings in floor or ground surfaces shall not allow passage of a sphere more than ½ inch diameter except as allowed for elevators and platform lifts as shown in ADA Figure 302.3 and on the Drawings.

F. Materials shall be compatible with materials or related Work with which they come into contact and the related materials sections.

G. Manufacturer/Applicator: Review and approve all details before construction. Confirm in writing to OWNER.

H. Installer: Coordinate services with related Work including layout of joint system and approval of methods for providing joints.

I. Installer: Inspect site to insure proper joint configuration in field.

J. Pre-installation Conference: Meet at project site well in advance of time scheduled for Work to proceed to review requirements for Work and conditions that could interfere with successful expansion joint system performance. Require every party concerned with concrete formwork, blockout, concrete placement, or others required to coordinate or protect the Work thereafter, to attend. Include manufacturer's technical representative and warranty officer.

K. Manufacturer: Provide qualified technical representative for periodic inspection of Work at critical time of the installation, including but not limited to pre-concrete formwork and placement site meetings, block out inspection, surface defect repair, surface preparation, metal work, expansion gland installation and waterproofing system installation.

L. Deliver all materials to site in original, unopened containers, bearing following information:

1. Name of product.
2. Name of manufacturer.
3. Date of preparation.
4. Lot or batch number.

M. Store materials under cover and protect from weather. Replace packages or materials showing any signs of damage with new material at no additional cost to Owner.

N. Weather and Substrate Conditions: Proceed with work only when existing and forecast weather and temperature of concrete substrate will permit work in accordance with manufacturer's recommendations.

O. Provide reports to owner detailing maintenance activities have been performed in accordance with written maintenance agreement for expansion joints.

## 1.7 WARRANTY

A. Warranty period shall be a 5 year labor and materials warranty commencing with date of acceptance of work.

1. Warranty shall be jointly executed by Manufacturer and Installer for labor and materials.
2. With bid submittal, provide Owner with sample of final labor and materials warranty including, but not limited, to the following: length of warranty, change in value of warranty – if any- based on length of remaining warranty period, transferability of warranty, responsibilities of each party, notification procedures, dispute resolution procedures, and limitations of liability for direct and consequential damages.
3. With bid submittal, provide the Owner with sample of Manufacturer's Licensing/Certification Agreement, detailing joint responsibilities of manufacturer and applicator with regard to warranty claim resolution.

B. Perform any repair under this warranty at no cost to Owner.

C. Expansion Joint Systems Manufacturer: Furnish OWNER with written Warranty detailing responsibilities of General Contractor, manufacturer and installer with regard to warranty requirements, as outlined in the Manufacturer's warranty and related Licensing/Certification documents. Submit a copy of the warranty and related documents and/or Licensing/Certification Agreement. The warranty shall provide that system will be free of defects, water penetration and chemical damage related to system design, workmanship or material deficiency, consisting of:

1. Any water leakage through the expansion joint system or leaking conditions of the reinforced membrane, other waterproofing components, or glands.
2. Any adhesive or cohesive failures of the system.
3. Shifting of plates out of alignment due to system failure.
4. Loose plates, anchor blocks, bolts.
5. Metal to metal noises during use.
6. Tears, weathering, or degradation in gland from normal use.
7. Expansion joint glands are considered defective if they buckle upwards beyond the level of the floor surface after installation.

D. If expansion joint systems or components show any of defects listed above, supply labor and material to repair all defects at no cost to OWNER.

1. Components of the systems include the following:

a. Extrusions
b. Bolts
c. Springs
d. Centering bars
e. Sound dampeners
f. Cover plates
g. Elastomeric header material
h. Reinforced membranes and associated drainage components

## 1.8 PERFORMANCE AND DESIGN CRITERIA

A. Expansion Joint Assembly Performance and Design Criteria: provide the following minimum requirements:

1. Expansion joint design shall meet or exceed the ability to accommodate expansion up to ¾ inch and compression up to ½ inch.
2. Expansion joint systems shall be capable of resisting a differential vertical movement of ½ inch.
3. Materials shall be supplied in lengths to minimize or eliminate the need to splice the waterproofing components.

    a. Materials shall be supplied with no joints in the vehicle drive aisles and with lengths no shorter than 20 feet.
    b. All mitered splices shall be performed at the factory and provide sufficient gland length for butt splicing with field splicing equipment.
    c. All Santoprene butt to butt splices shall be heat welded.
    d. Butt to butt splices with other materials shall be per manufacturer's recommendations.

B. Shop drawings shall include temperature adjustment table with expansion joint opening calculated at increments as indicated in Article "Submittals".

# PART 2 - PRODUCTS

## 2.1 SYSTEM DESCRIPTION

A. A single Installer shall be responsible for providing complete expansion joint system. Obtain all joint systems through one source from a single manufacturer.

B. Drawings indicate size, profiles, and dimensional requirements of joint systems and are schematic for systems indicated.

C. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.

## 2.2 PERFORMANCE REQUIREMENTS

A. Intent of this section is to insure that installed expansion joints allow pedestrian and vehicular traffic to pass in a smooth, quiet fashion with minimal maintenance required over a period of not less than 10 years. Expansion joints shall not only function as structural bridging elements, but must also accommodate structural expansions/contractions and minimize water leakage.

B. Provide design of expansion joint for preparation of final details for fabrication and construction of all concrete openings, expansion joint elements and required accessories. An integral part of this project is engineering for the following:

1. Include calculations for the size and forming of concrete openings to provide nominal joint width as indicated on drawings. Provide a summary of the design criteria used in the design.
2. Include calculations for the appropriate size of expansion joint elements in accordance with the expansion joint assembly performance criteria. Include installation requirements of expansion joint assembly for specific project conditions and scheduling. Provide a summary of design criteria used in design.

## 2.3 MANUFACTURERS

A. Subject to compliance with requirements, provide products from one of following manufacturers (listed in alphabetical order), only where specifically named in product categories:

1. Balco Inc., Wichita, KS (Balco).
2. Construction Specialties, Inc., Muncy, PA (C/S).
3. Dow Corning Corp., Midland, MI (Dow Corning).
4. Emseal Joint Systems, Westborough, MA (Emseal).
5. Erie Metal Specialties, Inc., Akron, NY (EMS).
6. Lymtal International Inc. Lake Orion, MI (Lymtal).
7. MM Systems Corporation, Atlanta, GA (MM).
8. TechStar, Inc., Findlay, OH (TechStar).
9. Tremco, Cleveland, OH (Tremco).
10. Watson Bowman Acme Corporation, a Division of BASF Construction Chemicals NA, Amherst, NY (WBA).

## 2.4 PRODUCTS, STANDARD EXPANSION JOINT SYSTEMS

A. Adhered extruded rubber expansion joint sealant system.

1. C/S Hybrid Compression Seal, Model HB, C/S.
2. Cebreg System, J or JP Series, EMS.
3. DuraFlex™ Elastic Seal ES Series, Balco.
4. Epoxy Bonded Sealing System, EBS Series, MM.
5. Iso-Flex Pressure Lok, Q Series, LymTal.
6. Jeene® Structural Sealing Joint System, WBA.
7. TechStar W-Seal; neoprene, TechStar.

B. Substitutions: **None** for this project. Contact Engineer/Architect for consideration for future projects.

## 2.5 PRODUCTS, OTHER

A. Extruded Neoprene closed cell rubber expansion joint for vertical applications, stair towers, columns, perimeter floor-to-wall joints.

1. DuraFlex™ Flex Seal FS Series, Balco.
2. Expanded Rubber Sealing System, ERS Series, MM.
3. Iso-Flex Foamflux Joint Seal, LymTal.
4. Wabo®InverSeal, WBA..

# PART 3 - EXECUTION

## 3.1 EXAMINATION

A. Examine surfaces where expansion joint systems will be installed for installation tolerances and other conditions affecting performance of work.

1. Proceed with installation only after unsatisfactory conditions have been corrected.

## 3.2 PREPARATION

A. Prepare substrates according to joint system manufacturer's written instructions.

B. Repair concrete slabs and blockouts using manufacturer's recommended repair grout of compressive strength adequate for anticipated structural loadings.

C. Coordinate and furnish anchorages, setting drawings, and instructions for installing joint systems. Provide fasteners of metal, type, and size to suit type of construction indicated and to provide for secure attachment of joint systems.

D. Coordinate and verify that related Work meets following requirements:

1. Concrete surfaces are finished as acceptable for system to be installed.
2. Check adhesion to substrates and recommend appropriate preparatory measures.
3. Curing compounds used on concrete surfaces are compatible with Work to be installed.
4. Concrete surfaces have completed proper curing period for system selected.
5. Coordinate expansion joint system with other related Work before installation of expansion joint.
6. Verify expansion joints are compatible with Joint Sealants and traffic toppings.

E. Acid etching: Prohibited.

F. All openings to occupied space shall be sealed to prevent cleaning materials, solvents and fumes from infiltration. All protective measures and/or ventilating systems required to prevent infiltration are incidental to this Work.

G. General Contractor: Correct unsatisfactory conditions in manner acceptable to installer before installing sealant system. All bugholes and air voids in blockouts shall be patched as acceptable to Engineer/Architect prior to installation of Expansion Joint Sealant system.

1. Proceed with expansion joint system only after unsatisfactory conditions have been corrected in manner acceptable to installer.

H. Clean joints thoroughly in accordance with manufacturer's instructions to remove all laitance, unsound concrete and curing compounds which may interfere with adhesion.

I. Cease installation of expansion joints under adverse weather conditions, or when temperatures are outside manufacturer's recommended limitations for installation.

J. Prepare for installation of extruded expansion joint systems in accordance with manufacturer's recommendations.

K. Cease installation if expansion joint blockouts and/or openings exhibit cracked edges, voids or spalls. Repair with accepted material prior to installation of expansion joint.

L. Check elevations on each side of expansion joint gap utilizing metal straight edge to ensure flush slab-to-slab transition. Recommend remedial correction.

M. Check anticipated or actual minimum and maximum joint openings with Engineer/Architect. Compare to manufacturer’s movement specifications and make joint sizing recommendations.

## 3.3 INSTALLATION

A. Comply with manufacturer's written instructions for storing, handling, and installing joint assemblies and materials unless more stringent requirements are indicated.

B. Manufacturer's technical representative, acceptable to Engineer/Architect, shall be on site during surface preparation and installation.

C. Cease material installation under adverse weather conditions, or when temperatures are outside manufacturers recommended limitations for installation, or when temperature of work area or substrate are below 40º F.

D. During months when historic mean daily temperature at Project is 20° F. or more colder than annual mean daily temperature, premolded sealant shall be installed on temporary basis to prevent hot weather buckling. Provide permanent installation during acceptable weather conditions.

E. Terminate exposed ends of joint assemblies with field- or factory-fabricated termination devices.

F. In-place testing: Prior to opening to traffic, test joint seal for leaks with maintained continuously wet for 12 hours. Repair leaks revealed by examination of seal underside. Repeat test and repairs until all leaks stopped for full 12 hours.

## 3.4 PROTECTION

A. Do not remove protective covering until finish work in adjacent areas is complete. When protective covering is removed, clean exposed metal surfaces to comply with manufacturer's written instructions.

B. Protect the installation from damage by work of other Sections. Where necessary due to heavy construction traffic, remove and properly store cover plates or seals and install temporary protection over joints. Reinstall cover plates or seals prior to Substantial Completion of the Work.

## 3.5 CLEANING

A. Clean off excess material and material smears adjacent to joints as work progresses using methods and materials approved by manufacturers.

**END OF SECTION 079500**

# SECTION 099113 - EXTERIOR PAINTING

## 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 surface preparation and the application of paint systems on the following exterior substrates:

1. Concrete.
2. Steel
3. Galvanized metal.

### 1.3 DEFINITIONS

A. MPI Gloss Level 1 (Matte Finish): Not more than five units at 60 degrees and 10 units at 85 degrees, according to ASTM D 523.

B. MPI Gloss Level 3 (‘Egg-Shell-Like’ Finish): 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.

C. MPI Gloss Level 4 (‘Satin-Like’ Finish): 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523.

D. MPI Gloss Level 5 (Semi-Gloss): 35 to 70 units at 60 degrees, according to ASTM D 523.

E. MPI Gloss Level 6 (Gloss): 70 to 85 units at 60 degrees, according to ASTM D 523.

### 1.4 ACTION SUBMITTALS

A. Product Data: For each type of product. Include preparation requirements and application instructions.

1. Include printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.
2. Indicate VOC content.

B. Samples for Initial Selection: For each type of topcoat product.

C. Product List: Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules. Include color designations.

## 1.5 QUALITY ASSURANCE

A. MPI Standards:

1. Products: Complying with MPI standards indicated and listed in "MPI Approved Products List."
2. Preparation and Workmanship: Comply with requirements in "MPI Architectural Painting Specification Manual" for products and paint systems indicated.
3. Final approval of color selections will be based on benchmark samples.

## 1.6 DELIVERY, STORAGE, AND HANDLING

A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F (7 deg C).

1. Maintain containers in clean condition, free of foreign materials and residue.
2. Remove rags and waste from storage areas daily.

# PART 2 - PRODUCTS

## 2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Behr Process Corporation.
2. Benjamin Moore & Co.
3. California Paints.
4. Conco Paints.
5. Coronado Paint; Benjamin Moore Company.
6. Diamond Vogel Paints.
7. Dulux (formerly ICI Paints); a brand of AkzoNobel.
8. Dunn-Edwards Corporation.
9. Duron, Inc.
10. Frazee Paint; Comex Group.
11. Glidden Professional.
12. Kelly-Moore Paint Company Inc.
13. Kwal Paint; Comex Group.
14. M.A.B. Paints.
15. Parker Paint; Comex Group.
16. PPG Architectural Finishes, Inc.
17. Pratt & Lambert.
18. Rodda Paint Co.

19. Rust-Oleum Corporation; a subsidiary of RPM International, Inc.
20. Sherwin-Williams Company (The).
21. Zinsser; Rust-Oleum Corporation.

## 2.2 PAINT, GENERAL

A. MPI Standards: Products shall comply with MPI standards indicated and shall be listed in its "MPI Approved Products Lists."

B. Material Compatibility:

1. Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a paint system, products shall be recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.

C. Colors: As selected by Owner from manufacturer's full range.

# PART 3 - EXECUTION

## 3.1 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:

1. Concrete: 12 percent.
2. Masonry (Clay and CMUs): 12 percent.
3. Gypsum Board: 12 percent.

C. Exterior Gypsum Board Substrates: Verify that finishing compound is sanded smooth.

D. Verify suitability of substrates, including surface conditions and compatibility, with existing finishes and primers.

E. Proceed with coating application only after unsatisfactory conditions have been corrected.

1. Application of coating indicates acceptance of surfaces and conditions.

## 3.2 PREPARATION

A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates and paint systems indicated.

B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.

1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection.

C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.

1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.

D. Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.

E. Masonry Substrates: Remove efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces or mortar joints exceeds that permitted in manufacturer's written instructions.

F. Steel Substrates: Remove rust, loose mill scale, and shop primer if any. Clean using methods recommended in writing by paint manufacturer.

G. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.

## 3.3 APPLICATION

A. Apply paints according to manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual."

1. Use applicators and techniques suited for paint and substrate indicated.
2. Paint surfaces behind movable items same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed items with prime coat only.

B. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

## 3.4 FIELD QUALITY CONTROL

A. Dry Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness.

1. Contractor shall touch up and restore painted surfaces damaged by testing.
2. If test results show that dry film thickness of applied paint does not comply with paint manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with paint manufacturer's written recommendations.

## 3.5 CLEANING AND PROTECTION

A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

## 3.6 EXTERIOR PAINTING SCHEDULE

Paint systems in this article are based on "MPI Manual." For renovation projects, consult "MPI Maintenance Repainting Manual" and revise paint systems accordingly.

A. Previously Painted, Steel and Iron Substrates:

1. Epoxy/Polyurethane System:

a. Prime Coat: Epoxy, High Build.

1) Sherwin-Williams, Macropoxy 646 or equivalent**.**

b. Topcoat: Polyurethane, Two-Component, Pigmented, exterior, gloss.

1) Sherwin-Williams, Acrolon 218 HS or equivalent

B. Concrete Substrates, Non-traffic Surfaces:

1. Latex System MPI EXT 3.1A:

a. Prime Coat: Primer, alkali resistant, water based.
b. Topcoat: Latex, exterior, flat (MPI Gloss Level 1).

**END OF SECTION 099113**

# SECTION 099121 - PAVEMENT MARKING - RESTORATION

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Contract 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. This Section includes surface preparation and application of high build paint systems to replace existing for the items of types, patterns, sizes, and colors described in this article.

B. Provide the following systems as shown on Drawings:

1. Parking Stall Stripes.
2. Traffic Arrows, crosswalks, accessible stall access aisles, walkways, symbols, stop bars, words and other markings.
3. International Symbol of Accessibility.

C. Provide painting of curbs and curb ramps as described in the following paragraphs:

1. Paint vertical surface and the first 6 in. of the abutting horizontal surface at the top of all curbs and islands (including PARCS equipment islands) within parking facility to match existing, unless otherwise noted on the Drawings.
2. Paint color for curbs and curb ramps shall be yellow.

D. Proportion International Symbol of Accessibility in accordance with ICC A117.1-2009 Accessible and Usable Buildings or 2010 ADA Standards for Accessible Design.

E. Related Work:

1. Pavement Marking Contractor shall verify compatibility with sealers, joint sealants, caulking and all other surface treatments as specified in Division 07.

### 1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Provide product data as follows:

1. Manufacturer’s certification that the material complies with standards referenced within this Section.
2. Intended paint use.

3. Pigment type and content.
4. Vehicle type and content.

C. Submit list of similar projects (minimum of 5) where pavement-marking paint has been in use for a period of not less than 2 yrs.

D. See requirements of Division 01 Section, “Submittal Procedures,” Part 1 heading, “Submittal Procedures,” for limits to resubmittals.

E. See requirements of Division 01 Section, “Submittal Procedures,” Part 2 heading, “Requests for Information,” for RFI constraints.

## 1.4 PROJECT CONDITIONS

A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 degrees F.

B. Do not apply paints in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 degrees F above the dew point; or to damp or wet surfaces.

## 1.5 QUALITY ASSURANCE

A. Provide written 1 year warranty to Owner that pavement markings will be free of defects due to workmanship, inadequate surface preparation, and materials including, but not limited to, fading and/or loss of markings due to abrasion, peeling, bubbling and/or delamination. Excessive delamination, peeling, bubbling or abrasion loss shall be defined as more than 15% loss of marking material within one year of substantial completion and/or occupancy of the parking area. With no additional cost to Owner, repair and/or recoat all pavement marking where defects develop or appear during warranty period and all damage to other Work due to such defects.

# PART 2 - PRODUCTS

## 2.1 MATERIALS

A. Pavement marking materials shall meet Federal, State and Local environmental standards.

B. Paint shall be manufactured and formulated from first grade raw materials and shall be free from defects or imperfections that might adversely affect product serviceability.

C. Paints shall comply with the National Organic Compound Emission Standards for Architectural Coatings, Environmental Protection Agency, 40 CFR Part 59.

D. The product shall not contain mercury, lead, hexavalent chromium, or halogenated solvents.

## 2.2 PAVEMENT MARKING PAINTS:

A. Low VOC - Solvent based paint may be employed for white and yellow pavement markings and shall meet the requirements of MPI #32

1. Available Products: Subject to compliance with the requirements, products that may be incorporated into the Work include, but are not limited to the following:

   a. Chlorinated Rubber Traffic & Zone Marking Paint, 7493/7494, by RAE Products & Chemicals Corporation
   b. Setfast Low VOC Acrylic Marking Paint, TM 5626/5627 by Sherwin Williams Company

B. 100% acrylic waterborne - paint shall be used for white and yellow pavement markings and shall meet requirements of MPI #70.

1. Available Products: Subject to compliance with the requirements, products that may be incorporated into the Work include, but are not limited to the following:

   a. Hi-Build Latex “Liquid Thermoplastic” Traffic & Zone Marking Paint, 5430/5431, by RAE Products & Chemicals Corporation
   b. Setfast Acrylic Waterborne Marking Paint, TM 226/227 by Sherwin Williams Company

2. 100% acrylic waterborne paint for special color pavement markings (blue, green, red, black) shall meet requirements of Federal Specification TT-P-1952E. Special color marking materials shall be compatible with the white and yellow pavement markings where they are layered.

C. All products shall have performance requirements of Type I and II of Federal Standard TT-P-1952E.

## 2.3 COLOR OF PAINT

A. Color of paint shall match existing, unless noted otherwise on Contract Drawings:

1. White: Match federal color chip 37925 and daylight directional reflectance (without glass beads) shall not be less than 84% (relative to magnesium oxide) when tested in accordance with Federal Test Method Standard 141, Method 6121.
2. Yellow: Match federal color chip No. 33538. Color shall have daylight directional reflectance (without glass beads) of not less than 50% (relative to magnesium oxide) when tested in accordance with Federal Test Method Standard 141, Method 6121.

3. Blue: Match federal color chip No. 35180. Color shall have daylight directional reflectance (without glass beads) of not less than 52% (relative to magnesium oxide) when tested in accordance with Federal Test Method Standard 141, Method 6121.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of work.

B. Document the location of existing striping and traffic marking, and colors utilized prior to removal of traffic lines and markings for surface preparation.

C. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.

D. Begin coating application only after unsatisfactory conditions have been corrected and surfaces are dry.

1. Beginning coating application constitutes Contractor's acceptance of substrates and conditions.

E. Striping shall not be placed until full cure of concrete repairs, sealers or coatings. Sealers (other than silane) generally require 14 days @ 70°F or higher. Silane sealers require 24 hrs @ 70°F or higher. Bituminous surfaces generally require 30 days @ 45° F or higher. Coatings shall be fully cured

### 3.2 PREPARATION

A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates and paint systems indicated.

B. Do not paint or finish any surface that is wet or damp.

C. Clean substrates of substances that could impair bond of paints, including dirt, dust, oil, grease, release agents, curing compounds, efflorescence, chalk, and incompatible paints and encapsulants.

D. Concrete Substrates: Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.

E. Lay out all striping on each tier, using existing layout, dimensions and details unless otherwise noted on Contract Drawings.

F. Report any discrepancies, interferences or changes in striping due to field conditions to Engineer/Architect prior to painting. Pavement Marking Contractor shall be required to remove paint, repair surface treatment and repaint stripes not applied in strict accordance with Contract Drawings.

G. Where existing painted pavement markings and/or stripes conflict with new striping layout or must be removed due to installation which does not conform to contract requirements, remove existing paint markings, using care to avoid scarring substrate surface.

1. Concrete and asphalt surfaces: Material shall be removed by methods acceptable to Engineer/Architect and cause as little damage as possible to surface texture of pavement. Methods, that can provide acceptable results, are grinding and air or shot blasting. Use of chemicals to remove pavement markings prohibited. Collect residue generated by removal of pavement markings and dispose of as required by all applicable laws and regulations. If grinding is used, lightly grind floor surface using wheel mounted floor grinder or similar equipment with positive elevation control of grinder head. For all removal techniques: On test area, demonstrate to Owner acceptable removal of paint material and control of paint removal equipment to prevent substrate scarring.
2. Traffic Topping/Membrane surfaces: Remove existing pavement markings by solvent washing or high-pressure water washing. Submit letter from traffic topping/membrane manufacturer certifying that solvents and/or water pressures are acceptable for this use and will not damage material. On test area, demonstrate to Owner acceptable removal of paint material and control of paint removal equipment to prevent substrate scarring.
3. Contractor shall not use paint, bituminous bond coat or other methods of covering markings to obliterate existing pavement markings.
4. Material deposited on pavement as a result of removal shall be removed as work progresses. Accumulation of material, that might interfere with drainage or might constitute a hazard to traffic, prohibited.
5. Curing compounds on new concrete surfaces (less than 1 yr old) shall be removed per existing pavement marking removal requirements prior to installation of new pavement markings.

H. Work Areas:

1. Store, mix and prepare paints only in areas designated by Contractor for that purpose.
2. Provide clean cans and buckets required for mixing paints and for receiving rags and other waste materials associated with painting. Clean buckets regularly. At close of each day's Work, remove used rags and other waste materials associated with painting.
3. Take precautions to prevent fire in or around painting materials. Provide and maintain appropriate hand fire extinguisher near paint storage and mixing area.

I. Mixing:

1. Do not intermix materials of different character or different manufacturer.
2. Do not thin material except as recommended by manufacturer.

J. Disposal:

1. Contractor shall properly dispose of unused materials and containers in compliance with Federal Resource Conservation Recovery Act (RCRA) of 1976 as amended, and all other applicable laws and regulations.

## 3.3 APPLICATION

A. Apply painting and finishing materials in accordance with manufacturer's directions. Use applications and techniques best suited for material and surfaces to which applied. Minimum air shall be used to prevent overspray. Temperature during application shall be minimum of 40º F and rising, unless manufacturer requires higher minimum temperature. Maximum relative humidity shall be as required by manufacturer.

1. Total wet mil thickness of 0.015 in (minimum).
2. Total dry film thickness of 0.008 in (minimum).

B. All lines shall be straight, true, and sharp without fuzzy edges, overspray or non-uniform application. Corners shall be at right angles, unless shown otherwise, with no overlaps. Line width shall be uniform (-0%, +5% from specified width). No excessive humping (more material in middle than at edges or vice versa).

C. All lines shall be 4-inches wide unless otherwise noted.

**END OF SECTION 099121**

# SECTION 260001
# BASIC ELECTRICAL REQUIREMENTS

## PART 1. - GENERAL

### 1.1 GENERAL REQUIREMENTS

A. Contract and General and Supplementary Conditions and Division 1 Specifications are hereby made a part of Division 26 as fully as if repeated herein. Where provisions of Division 1 and 26 conflict, the greater or more strict shall prevail.

B. This Section includes general administrative and procedural requirements for electrical installations. The requirements included in this Section expand the requirements specified in other division of these specifications.

C. All electrical work shall comply with the requirements indicated in all sections of Division 26.

D. Employ services of personnel regularly engaged in each type of work required under this Division.

E. Provide workmanship in accordance with the best accepted practices. Rework installations judged by the Architect as unacceptable.

F. Provide labor, tools, and equipment necessary to provide a complete and properly operating installation of Electrical and related Work as specified and indicated.

G. Visit areas of construction where Work is to take place, and examine the construction site carefully, noting locations and conditions under which the Work will be performed and accepting the responsibility for performing the Work under the existing conditions.

H. Arrange and pay for permits, licenses, inspections and certificates. Request inspections from Authorities having jurisdiction. At the conclusion of the work, deliver certificates of inspection from authorities having jurisdiction to the Owner's Representative.

I. Examine Drawings and other Divisions of Specifications for requirements that affect work of this Division.

### 1.2 SCOPE OF WORK

A. The work to be done under this Division of the Specifications shall include the furnishing of all labor, material, equipment, tools and appurtenances and performing all operations necessary to furnish and install the complete electrical work in accordance with the specifications, the drawings and standards of the applicable codes listed herein.

B. The work shall include, but is not necessarily limited to, the furnishing and installation of systems and equipment as follows:

1. Lighting systems including all fixtures, wiring, control devices and mounting equipment as required for a completely operational system as outlined on the drawings.
2. Testing of electrical equipment and systems including demonstration of satisfactory operation.
3. Cutting and patching required for the work of this division.
4. Touch up painting of prefinished equipment furnished by this contractor.
5. All materials and appurtenances that can reasonably be inferred to be a part of the electrical systems and necessary to its proper operation, but not specifically mentioned or indicated on the drawings, shall be furnished and installed without additional charge.

## 1.3 QUALIFICATIONS/QUALITY ASSURANCE

A. Contractor shall institute and maintain a Quality Assurance Program for the performance of all the work.

B. Utilize installers with at least five years experience in the type of work to be performed.

C. Manufacturers shall be companies experienced in manufacturing products specified for a minimum of five years.

D. Refer to Division 1 for additional requirements for quality assurance and control of the installation.

## 1.4 REGULATORY REQUIREMENTS

A. Provide products listed and classified by Nationally Recognized Testing Laboratories (NRTL) as suitable for purpose specified and indicated. Provide NRTL-listed material and equipment where standards are available. Notify architect of any material or equipment that is not NRTL listed.

B. Perform work in strict accordance with the rules, regulations, standards, codes, ordinances, and laws of local, state, and Federal governments, and other authorities having legal jurisdiction over the site. No additional compensation shall be granted for work which must be changed as a result of the work not originally complying with the codes, standards, etc. Materials and equipment shall be manufactured, installed and tested as specified in latest or required editions of applicable parts of the following publications, standards and rulings of:

1. Enforced Building Code as identified in the Architectural Specifications
2. NEC - National Electrical Code (ANSI/NFPA 70).
3. UL - Underwriters' Laboratories, Inc.
4. NRTL - Nationally Recognized Testing Laboratory.
5. NEMA - National Electrical Manufacturers' Association
6. IEEE - Institute of Electrical and Electronics Engineers

7. ASTM - American Society for Testing Materials
8. ANSI - American National Standards Institute
9. NBFU - National Board of Fire Underwriters
10. NFPA - National Fire Protection Association
11. ICEA - Insulated Cable s' Association
12. OSHA - Occupational Safety and Health Act
13. ADA - Americans with Disabilities Act

C. Where conflicts occur among the codes, ordinances, standards, Drawings or Specifications, the more restrictive requirements shall govern.

D. The Drawings and Specifications do not undertake to repeat requirements written in the above codes, ordinances and standards.

E. Toxicity: Comply with applicable codes and regulations regarding toxicity of combustion products of materials used.

F. Refer to Division 1 for additional regulatory requirements.

## 1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to the project properly identified with names, model numbers, trades, compliance labels, and other information needed for identification.

B. Products shall be adequately packaged and protected to prevent damage during shipment, storage, and handling.

C. Store equipment and materials at the site, as coordinated with the Project Superintendent, unless off-site storage is authorized in writing. Protect stored equipment and material from damage.

D. Coordinate deliveries of electrical materials and equipment to minimize construction site congestion. Limit each shipment of materials and equipment to items and quantities needed for the smooth and efficient flow of installation.

## 1.6 SUBMITTALS

A. All Submittals shall be made in accordance with the provisions of Division 1.

B. Product Data: Submit manufacturer’s catalog data sheets or other published materials indicating electrical ratings, performance characteristics, dimensions, appearances, installation methods, and space requirements of electrical equipment and accessories as listed below and as required by the individual specification sections.

1. 26 05 03 Equipment Wiring Connections
2. 26 05 19 Electrical Power Conductors and Cables
3. 26 05 26 Grounding and Bonding for Electrical Systems
4. 26 05 29 Hangers and Supports for Electrical Systems

5. 26 05 33 Raceway and Boxes for Electrical Systems
6. 26 51 00 InteriorLighting
7. 26 56 00 Exterior Lighting

C. Manufacturer's Instructions:

1. Indicate application conditions and limitations of use stipulated by product testing agency specified under regulatory requirements.
2. Include instructions for storage, handling, protection, examination, preparation, installation, operation and maintenance of product.

D. The Electrical Contractor shall include a listing or schedule identifying all shop drawings and product approval documentation to be submitted and the anticipated time frame for receipt of such documentation by the architect.

## 1.7 WARRANTY

A. Remedy work performed under this Division that is found not to comply with the Contract Documents or fails less than one year from the date of final acceptance.

B. Refer to Division 1 for additional warranty (guarantee) requirements.

C. Refer to individual sections for owner-furnished, contractor-installed equipment.

## 1.8 PROJECT RECORD DOCUMENTS

A. Submit under provisions of Division 1 the following:

1. Record Drawings
2. Record Specifications
3. Product Data
4. Maintenance (and Operating) Manual.
5. Equipment Warranties.
    a. Refer to Division 1 for additional Project record document requirements.

B. The Contractor shall provide and maintain at the site a set of RED-LINED prints on which shall be accurately indicated the actual installation of all work under this Division, indicating any variation from contract drawings, including changes in sizes, locations and dimensions. Changes in circuitry shall be clearly and completely indicated as the work progresses on both the drawings and the panelboard schedules located in the specifications.

C. The progress prints indicated above shall be available for inspection by the architect and shall be used to determine the progress of electrical work.

D. At the completion of the work, prepare a new set of reproducible record drawings of the work as actually noted on the marked-up prints.

E. The Contractor shall provide phase load data and final circuit identification for all panelboards as part of record drawing submittal.

## 1.9 OPERATION AND MAINTENANCE DATA

A. After completion of the work, the Contractor shall furnish and deliver copies of a complete manual. Each manual shall include one (1) copy of each approved shop drawing, catalog pages, instruction sheets, operating instructions, installation and maintenance instructions, and spare parts bulletins. Provide separate sections for each electrical system, i.e., power systems (AC and DC), lighting system, fire alarm system, security system, etc.

B. Submit manuals in 3-ring binders, properly indexed and with a Table of Contents.

C. Furnish these manuals to the Architect for review and transmission to Owner.

D. Refer to Division 1 for additional requirements.

## 1.10 INTERPRETATION OF CONTRACT DOCUMENTS

A. Where Drawings or Specifications conflict or are unclear, advise Architect in writing before Award of Contract. Otherwise, interpretations of Contract Documents by the Architect shall be final, and no additional compensation shall be permitted due to discrepancies or inconsistencies in the documents resolved according to the Architect's interpretation.

B. The intent of the Drawings and Specifications is to assist and guide the Contractor and to establish minimum requirements.

C. Drawings and Specifications form complimentary requirements; provide work specified and not shown, and work shown and not specified as though explicitly required by both.

D. Should there be conflicts in Contract Documents, provide the greater quantity, the higher quality and the more restrictive of equipment and work and notify the architect of the discrepancy.

E. Specifically stated requirements supersede general ones.

F. Electrical Drawings do not limit the Contractor’s responsibility of determining full extent of work required by Contract Documents. Refer to Architectural, Civil, Structural, Electrical and other Drawings and other Divisions of the Specifications that indicate types of construction in which the Work shall be installed and the work of other trades with which work of this Division must be coordinated.

G. Except where modified by a specific notation to the contrary, it shall be understood that the indication and/or description of any item, in the drawings or specifications or both, carries with it the instruction to furnish and install the item, regardless of whether or not this instruction is explicitly stated as part of the indication or description.

   1. Items referred to in singular number in Contract Documents shall be provided in quantities necessary to complete work.

2. Where Drawings or Specifications do not coincide with manufacturer's recommendations, or with applicable codes and standards, alert Architect in writing before installation. Otherwise, make changes in installed work as architect requires within Contract Price.
3. It is the intent of these contract documents to have the contractor provide systems and components that are fully complete and operational and fully suitable for the intended use. There may be situations in the documents where insufficient information exists to precisely describe a certain component or subsystem, or the routing of a component. In cases such as this, where the contractor has failed to notify the architect of the situation prior to contract award, the contractor shall provide the specific component or subsystem with all parts necessary for the intended use, fully complete and operational, and installed in workmanlike manner either concealed or exposed per the design intent.
4. In situations or where potential conflicts exist where the contractor believes he needs engineering guidance, he shall submit a sketch identifying his proposed solution and the architect shall review, note if necessary, and return this sketch appropriately marked for use by the Contractor.
5. Portions of these Drawings and Specifications are abbreviated and may include incomplete sentences. Infer the omitted words or phrases such as "the Contractor shall", "shall be", "as indicated on the Drawings", "in accordance with details", "a", "the", and "all".
6. "As permitted" means by Code, by architect or by prevailing conditions.
7. "Acceptable", "approved", and "satisfactory" means by architect.
8. Drawings are generally diagrammatic and indicate the arrangement and approximate location of fixtures, equipment and conduits. When necessary to deviate from the arrangement indicated to meet structural conditions or to clear work of other Divisions, inform the architect of proposed deviation before proceeding. Obtain in the field all information relevant to the placing of electrical work.
9. Drawings and Specifications do not undertake to indicate every item required to produce a complete and properly operating installation. Materials, equipment or labor not indicated but which can be reasonably inferred to be necessary for a fully complete, secure and properly operating installation suitable for the intended use shall be provided.
10. The right is reserved to make reasonable (within 10’-0”) changes in locations of equipment indicated in Drawings prior to installation without increase in contract cost.
11. Schematic diagrams shown on the drawings indicate the required functions only. Standard circuits of the particular manufacturer may be used to accomplish the functions indicated without exact adherence to the schematic drawings shown. Additional wiring or conduit required for such deviations shall be furnished at Contractor's expense.
12. Generally, except in the case of empty and underground raceways, the runs of feeder, branch circuits and signal systems raceways are not indicated on the drawings. Final determination as to the routing shall be governed by structural conditions, and interferences with other trades, by terminal locations on apparatus, as approved by the Project Manager.

PART 2. PRODUCTS

2.1 SPECIFIED PRODUCTS AND SUBSTITUTIONS

A. Provide new, unused, full weight, standard equipment which meets or exceeds Contract Document requirements to the satisfaction of the Architect .

B. Provide NRTL listed or labeled equipment and assemblies where standards exist. MANUFACTURER AND CONTRACTOR SHALL CLEARLY INDICATE ANY EQUIPMENT, COMPONENTS OR ASSEMBLIES THAT ARE NOT NRTL LISTED OR LABELED.

C. Submit substitutions under provisions of Division 1 where permitted in individual sections.

D. The manufacturer's catalog number and description is the basis of the design and establishes quality and performance required for this project.

E. The description following a catalog number is basically to identify the item but may also call for accessories, options, or modifications which are beyond the cataloged item.

PART 3. - EXECUTION

3.1 PREPARATION

A. Receive, handle, house, and protect pre-purchased and owner furnished equipment required for installation under this Division. Replace damaged equipment with new equipment.

B. Investigate each space in the structure through which equipment must pass to reach its final location. If necessary, the Contractor shall request the manufacturer to ship the equipment in sections sized to permit passage.

C. Arrangements shall be made to have the openings, inserts, sleeves and other such incidentals set in place ahead of the construction work, where practical to eliminate the need for cutting and patching. If cutting becomes necessary for the installation of the work, the cutting and resulting patching shall be done under this Division in accordance with the requirements of Division 1. All openings shall be neatly patched and finished to match the adjoining work in a manner approved by the architect and shall be performed by craftsmen skilled and experienced in work. Any penetration in fire-rated walls or floors must be patched to maintain its fire rating as indicated in Division 7. All cutting shall be performed in a manner not to weaken the structural parts. The cutting manner and method shall meet the approval of the architect.

D. The equipment shall be kept upright at all times. If equipment has to be tilted for ease of passage through restricted areas, the contractor shall brace the equipment to ensure that the tilting does not impair the functional integrity of the equipment.

3.2 INSTALLATION

A. Do not cut structural members without written acknowledgment from the architect.

B. All equipment shall be installed and bolted in place.

C. Do not attach equipment to metal roof decking.

D. Arrange equipment so working parts are accessible for inspection, repair, and renewal.

E. Where not specified or indicated, mount equipment at heights directed by the Engineer.

F. Generally, the Drawings do not show wiring and junction or pull boxes. Provide wiring to best suit circuiting indicated on the Drawings, and in compliance with the NEC.

G. Where practicable and where not indicated otherwise, group circuits into multi-wire branch circuits. Make certain not to exceed 6 current carrying conductors in any one conduit run unless indicated otherwise in the contract documents. Protect multi-wire circuits with multi-pole or adjacent single-pole overcurrent devices. Single-phase circuits protected by ground-fault circuit interrupters require separate neutrals.

H. Do not reduce the number of homeruns indicated on the Drawings without written acknowledgment from the Engineer .

I. Circuits on panelboards shall be field connected to result in evenly balanced loads on each phase.

J. The panelboard circuit numbering system is to be adhered to with the exception of conflicts encountered during the progress of the project. Any required deviations shall be reported to the Engineer for concurrence and approval.

K. Any work installed contrary to Contract Drawings shall be subject to change as directed by the Engineer, and no extra compensation will be allowed for making these changes.

L. Where installed in damp, wet and areas requiring washdown all surface mounted panel boxes, junction boxes, conduit, etc., shall be supported by spacers to provide a clearance between wall and equipment.

M. All connections to equipment shall be made as required, and in accordance with the approved shop drawings.

N. Unless otherwise approved by the Engineer, conduit indicated exposed shall be installed exposed; conduit indicated concealed shall be installed concealed.

O. Where exact locations are required by equipment for stubbing-up and terminating conduit concealed in floor slabs, the Contractor shall request shop drawings, equipment location drawings, foundation drawings, and any other data required by him to locate the concealed conduit before the floor slab is poured.

P. Fire ratings of enclosures, walls, ceilings, and floors shall be maintained. Penetrations for electrical Work shall be fire-stopped by this Contractor as indicated in Division 7, indicated in individual Sections on Drawings, or indicated by architect. Review Architectural drawings for fire ratings.

Q. Water Tightness of enclosures, walls, ceilings, and floors shall be maintained. Provide necessary fittings and accessories. Provide necessary fittings, accessories and coordination as required by architect.

## 3.3 TESTING AND INSPECTIONS

A. Refer to Division 1 for general requirements relating to the starting and demonstration of systems and instructions on operation.

B. Test and demonstrate the satisfactory operation of systems provided in accordance with the Specifications.

C. The Contractor shall familiarize and instruct the Owner's personnel with the nature, operation and maintenance of the systems and equipment provided under this Division.

END OF SECTION 26 00 01

# SECTION 260505
# SELECTIVE DEMOLITION FOR ELECTRICAL

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Electrical demolition.

### 1.02 RELATED REQUIREMENTS

A. Section 017000 - Execution and Closeout Requirements: Additional requirements for alterations work.

## PART 2 PRODUCTS

### 2.01 MATERIALS AND EQUIPMENT

A. Materials and equipment for patching and extending work: As specified in individual sections.

## PART 3 EXECUTION

### 3.01 EXAMINATION

A. Verify field measurements and circuiting arrangements are as indicated.

B. Verify that abandoned wiring and equipment serve only abandoned facilities.

C. Demolition drawings are based on casual field observation and existing record documents.

D. Report discrepancies to Architect before disturbing existing installation.

E. Beginning of demolition means installer accepts existing conditions.

### 3.02 PREPARATION

A. Disconnect electrical systems in walls, floors, and ceilings to be removed.

B. Coordinate utility service outages with utility company.

C. Provide temporary wiring and connections to maintain existing systems in service during construction. When work must be performed on energized equipment or circuits, use personnel experienced in such operations.

D. Existing Electrical Service: Maintain existing system in service until new system is complete and ready for service. Disable system only to make switchovers and connections. Minimize outage duration.
   1. Obtain permission from Owner at least 24 hours before partially or completely disabling system.
   2. Make temporary connections to maintain service in areas adjacent to work area.

### 3.03 DEMOLITION AND EXTENSION OF EXISTING ELECTRICAL WORK

A. Remove, relocate, and extend existing installations to accommodate new construction.

B. Remove abandoned wiring to source of supply.

C. Remove exposed abandoned conduit, including abandoned conduit above accessible ceiling finishes. Cut conduit flush with walls and floors, and patch surfaces.

D. Disconnect abandoned outlets and remove devices. Remove abandoned outlets if conduit servicing them is abandoned and removed. Provide blank cover for abandoned outlets that are not removed.

E. Disconnect and remove abandoned luminaires. Remove brackets, stems, hangers, and other accessories.

F. Repair adjacent construction and finishes damaged during demolition and extension work.

G. Maintain access to existing electrical installations that remain active. Modify installation or provide access panel as appropriate.

H. Extend existing installations using materials and methods compatible with existing electrical installations, or as specified.

**3.04 CLEANING AND REPAIR**

A. See Section 017419 - Construction Waste Management and Disposal for additional requirements.

B. Clean and repair existing materials and equipment that remain or that are to be reused.

**END OF SECTION**

# SECTION 260519
# LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Single conductor building wire.

B. Wiring connectors.

C. Electrical tape.

D. Heat shrink tubing.

E. Oxide inhibiting compound.

F. Wire pulling lubricant.

G. Cable ties.

H. Firestop sleeves.

### 1.02 RELATED REQUIREMENTS

A. Section 078400 - Firestopping.

B. Section 260505 - Selective Demolition for Electrical: Disconnection, removal, and/or extension of existing electrical conductors and cables.

C. Section 260526 - Grounding and Bonding for Electrical Systems: Additional requirements for grounding conductors and grounding connectors.

### 1.03 REFERENCE STANDARDS

A. ASTM B3 - Standard Specification for Soft or Annealed Copper Wire 2013 (Reapproved 2018).

B. ASTM B8 - Standard Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft 2011 (Reapproved 2017).

C. ASTM B33 - Standard Specification for Tin-Coated Soft or Annealed Copper Wire for Electrical Purposes 2010, with Editorial Revision (2020).

D. ASTM B787/B787M - Standard Specification for 19 Wire Combination Unilay-Stranded Copper Conductors for Subsequent Insulation 2004 (Reapproved 2020).

E. ASTM D3005 - Standard Specification for Low-Temperature Resistant Vinyl Chloride Plastic Pressure-Sensitive Electrical Insulating Tape 2017.

F. NECA 1 - Standard for Good Workmanship in Electrical Construction 2015.

G. NEMA WC 70 - Power Cables Rated 2000 Volts or Less for the Distribution of Electrical Energy 2009.

H. NETA ATS - Acceptance Testing Specifications for Electrical Power Equipment and Systems 2017.

I. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

J. UL 44 - Thermoset-Insulated Wires and Cables Current Edition, Including All Revisions.

K. UL 83 - Thermoplastic-Insulated Wires and Cables Current Edition, Including All Revisions.

L. UL 486A-486B - Wire Connectors Current Edition, Including All Revisions.

M. UL 486C - Splicing Wire Connectors Current Edition, Including All Revisions.

N. UL 486D - Sealed Wire Connector Systems Current Edition, Including All Revisions.

O. UL 510 - Polyvinyl Chloride, Polyethylene, and Rubber Insulating Tape Current Edition, Including All Revisions.

### 1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Coordinate sizes of raceways, boxes, and equipment enclosures installed under other sections with the actual conductors to be installed, including adjustments for conductor sizes increased for voltage drop.
   2. Coordinate with electrical equipment installed under other sections to provide terminations suitable for use with the conductors to be installed.
   3. Notify Architect of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

### 1.05 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manufacturer's standard catalog pages and data sheets for conductors and cables, including detailed information on materials, construction, ratings, listings, and available sizes, configurations, and stranding.

C. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

### 1.06 QUALITY ASSURANCE

A. Comply with requirements of NFPA 70.

B. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

### 1.07 DELIVERY, STORAGE, AND HANDLING

A. Receive, inspect, handle, and store conductors and cables in accordance with manufacturer's instructions.

### 1.08 FIELD CONDITIONS

A. Do not install or otherwise handle thermoplastic-insulated conductors at temperatures lower than 14 degrees F (-10 degrees C), unless otherwise permitted by manufacturer's instructions. When installation below this temperature is unavoidable, notify Architect and obtain direction before proceeding with work.

## PART 2 PRODUCTS

### 2.01 CONDUCTOR AND CABLE APPLICATIONS

A. Do not use conductors and cables for applications other than as permitted by NFPA 70 and product listing.

B. Provide single conductor building wire installed in suitable raceway unless otherwise indicated, permitted, or required.

### 2.02 CONDUCTOR AND CABLE GENERAL REQUIREMENTS

A. Provide products that comply with requirements of NFPA 70.

B. Provide products listed, classified, and labeled as suitable for the purpose intended.

C. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, etc. as required for a complete operating system.

D. Comply with NEMA WC 70.

E. Thermoplastic-Insulated Conductors and Cables: Listed and labeled as complying with UL 83.

F. Thermoset-Insulated Conductors and Cables: Listed and labeled as complying with UL 44.

G. Conductor Material:
   1. Provide copper conductors only. Aluminum conductors are not acceptable for this project. Conductor sizes indicated are based on copper.
   2. Copper Conductors: Soft drawn annealed, 98 percent conductivity, uncoated copper conductors complying with ASTM B3, ASTM B8, or ASTM B787/B787M unless otherwise indicated.
   3. Tinned Copper Conductors: Comply with ASTM B33.

H. Minimum Conductor Size:
   1. Branch Circuits: 12 AWG.
      a. Exceptions:
         1) 20 A, 120 V circuits longer than 75 feet (23 m): 10 AWG, for voltage drop.
         2) 20 A, 120 V circuits longer than 150 feet (46 m): 8 AWG, for voltage drop.
         3) 20 A, 277 V circuits longer than 150 feet (46 m): 10 AWG, for voltage drop.

I. Where conductor size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.

J. Conductor Color Coding:
   1. Color code conductors as indicated unless otherwise required by the authority having jurisdiction. Maintain consistent color coding throughout project.
   2. Color Coding Method: Integrally colored insulation.
   3. Color Code:
      a. 480Y/277 V, 3 Phase, 4 Wire System:
         1) Phase A: Brown.
         2) Phase B: Orange.
         3) Phase C: Yellow.
         4) Neutral/Grounded: Gray.
      b. 208Y/120 V, 3 Phase, 4 Wire System:
         1) Phase A: Black.
         2) Phase B: Red.
         3) Phase C: Blue.
         4) Neutral/Grounded: White.
      c. Equipment Ground, All Systems: Green.
      d. Isolated Ground, All Systems: Green with yellow stripe.
      e. Travelers for 3-Way and 4-Way Switching: Pink.
      f. For modifications or additions to existing wiring systems, comply with existing color code when existing code complies with NFPA 70 and is approved by the authority having jurisdiction.

## 2.03 SINGLE CONDUCTOR BUILDING WIRE

A. Manufacturers:
   1. Copper Building Wire:
      a. Cerro Wire LLC: www.cerrowire.com/#sle.
      b. Encore Wire Corporation: www.encorewire.com/#sle.
      c. General Cable Technologies Corporation: www.generalcable.com/#sle.
      d. Service Wire Co: www.servicewire.com/#sle.
      e. Southwire Company: www.southwire.com/#sle.

B. Description: Single conductor insulated wire.

C. Conductor Stranding:
   1. Feeders and Branch Circuits:
      a. Size 10 AWG and Smaller: Solid.
      b. Size 8 AWG and Larger: Stranded.
   2. Control Circuits: Stranded.

D. Insulation Voltage Rating: 600 V.

E. Insulation:
   1. Copper Building Wire: Type THHN/THWN or THHN/THWN-2, except as indicated below.
      a. Size 4 AWG and Larger: Type XHHW-2.
      b. Installed Underground: Type XHHW-2.
      c. Fixture Wiring Within Luminaires: Type TFFN/TFN for luminaires with labeled maximum temperature of 90 degrees C; Approved suitable type for luminaires with labeled maximum temperature greater than 90 degrees C.

**2.04 WIRING CONNECTORS**

A. Description: Wiring connectors appropriate for the application, suitable for use with the conductors to be connected, and listed as complying with UL 486A-486B or UL 486C as applicable.

B. Connectors for Grounding and Bonding: Comply with Section 260526.

C. Wiring Connectors for Splices and Taps:
   1. Copper Conductors Size 8 AWG and Smaller: Use twist-on insulated spring connectors.
   2. Copper Conductors Size 6 AWG and Larger: Use mechanical connectors or compression connectors.

D. Twist-on Insulated Spring Connectors: Rated 600 V, 221 degrees F (105 degrees C) for standard applications and 302 degrees F (150 degrees C) for high temperature applications; pre-filled with sealant and listed as complying with UL 486D for damp and wet locations.

E. Mechanical Connectors: Provide bolted type or set-screw type.

F. Compression Connectors: Provide circumferential type or hex type crimp configuration.

**2.05 ACCESSORIES**

A. Electrical Tape:
   1. Vinyl Insulating Electrical Tape: Complying with ASTM D3005 and listed as complying with UL 510; minimum thickness of 7 mil (0.18 mm); resistant to abrasion, corrosion, and sunlight; conformable for application down to 0 degrees F (-18 degrees C) and suitable for continuous temperature environment up to 221 degrees F (105 degrees C).

B. Wire Pulling Lubricant: Listed; suitable for use with the conductors or cables to be installed and suitable for use at the installation temperature.

C. Cable Ties: Material and tensile strength rating suitable for application.

**PART 3 EXECUTION**

**3.01 EXAMINATION**

A. Verify that interior of building has been protected from weather.

B. Verify that work likely to damage wire and cable has been completed.

C. Verify that raceways, boxes, and equipment enclosures are installed and are properly sized to accommodate conductors and cables in accordance with NFPA 70.

D. Verify that field measurements are as indicated.

E. Verify that conditions are satisfactory for installation prior to starting work.

**3.02 PREPARATION**

A. Clean raceways thoroughly to remove foreign materials before installing conductors and cables.

**3.03 INSTALLATION**

A. Circuiting Requirements:
   1. Unless dimensioned, circuit routing indicated is diagrammatic.
   2. When circuit destination is indicated without specific routing, determine exact routing required.
   3. Arrange circuiting to minimize splices.
   4. Include circuit lengths required to install connected devices within 10 ft (3.0 m) of location indicated.
   5. Maintain separation of wiring for emergency systems in accordance with NFPA 70.
   6. Circuiting Adjustments: Unless otherwise indicated, when branch circuits are indicated as separate, combining them together in a single raceway is not permitted.
   7. Common Neutrals: Unless otherwise indicated, sharing of neutral/grounded conductors among up to three single phase branch circuits of different phases installed in the same raceway is not permitted. Provide dedicated neutral/grounded conductor for each individual branch circuit.

B. Install products in accordance with manufacturer's instructions.

C. Perform work in accordance with NECA 1 (general workmanship).

D. Installation in Raceway:
   1. Tape ends of conductors and cables to prevent infiltration of moisture and other contaminants.
   2. Pull all conductors and cables together into raceway at same time.
   3. Do not damage conductors and cables or exceed manufacturer's recommended maximum pulling tension and sidewall pressure.
   4. Use suitable wire pulling lubricant where necessary, except when lubricant is not recommended by the manufacturer.

E. Paralleled Conductors: Install conductors of the same length and terminate in the same manner.

F. Secure and support conductors and cables in accordance with NFPA 70 using suitable supports and methods approved by the authority having jurisdiction. Provide independent support from building structure. Do not provide support from raceways, piping, ductwork, or other systems.

G. Install conductors with a minimum of 12 inches (300 mm) of slack at each outlet.

H. Neatly train and bundle conductors inside boxes, wireways, panelboards and other equipment enclosures.

I. Group or otherwise identify neutral/grounded conductors with associated ungrounded conductors inside enclosures in accordance with NFPA 70.

J. Make wiring connections using specified wiring connectors.
   1. Make splices and taps only in accessible boxes. Do not pull splices into raceways or make splices in conduit bodies or wiring gutters.

2. Remove appropriate amount of conductor insulation for making connections without cutting, nicking or damaging conductors.
3. Do not remove conductor strands to facilitate insertion into connector.
4. Clean contact surfaces on conductors and connectors to suitable remove corrosion, oxides, and other contaminates. Do not use wire brush on plated connector surfaces.
5. Mechanical Connectors: Secure connections according to manufacturer's recommended torque settings.
6. Compression Connectors: Secure connections using manufacturer's recommended tools and dies.

K. Insulate splices and taps that are made with uninsulated connectors using methods suitable for the application, with insulation and mechanical strength at least equivalent to unspliced conductors.

L. Insulate ends of spare conductors using vinyl insulating electrical tape.

M. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 078400.

N. Unless specifically indicated to be excluded, provide final connections to all equipment and devices, including those furnished by others, as required for a complete operating system.

**3.04 FIELD QUALITY CONTROL**

A. See Section 014000 - Quality Requirements, for additional requirements.

B. Inspect and test in accordance with NETA ATS, except Section 4.

C. Perform inspections and tests listed in NETA ATS, Section 7.3.2. The insulation resistance test is required for all conductors. The resistance test for parallel conductors listed as optional is not required.

D. Correct deficiencies and replace damaged or defective conductors and cables.

**END OF SECTION**

# SECTION 260526
# GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Grounding and bonding requirements.

B. Conductors for grounding and bonding.

C. Connectors for grounding and bonding.

### 1.02 RELATED REQUIREMENTS

A. Section 260519 - Low-Voltage Electrical Power Conductors and Cables: Additional requirements for conductors for grounding and bonding, including conductor color coding.

B. Section 260553 - Identification for Electrical Systems: Identification products and requirements.

C. Section 265600 - Exterior Lighting: Additional grounding and bonding requirements for pole-mounted luminaires.

### 1.03 REFERENCE STANDARDS

A. NECA 1 - Standard for Good Workmanship in Electrical Construction 2015.

B. NETA ATS - Acceptance Testing Specifications for Electrical Power Equipment and Systems 2017.

C. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

D. UL 467 - Grounding and Bonding Equipment Current Edition, Including All Revisions.

### 1.04 QUALITY ASSURANCE

A. Comply with requirements of NFPA 70.

## PART 2 PRODUCTS

### 2.01 GROUNDING AND BONDING REQUIREMENTS

A. Do not use products for applications other than as permitted by NFPA 70 and product listing.

B. Unless specifically indicated to be excluded, provide all required components, conductors, connectors, conduit, boxes, fittings, supports, accessories, etc. as necessary for a complete grounding and bonding system.

C. Where conductor size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.

D. Bonding and Equipment Grounding:
   1. Provide bonding for equipment grounding conductors, equipment ground busses, metallic equipment enclosures, metallic raceways and boxes, device grounding terminals, and other normally non-current-carrying conductive materials enclosing electrical conductors/equipment or likely to become energized as indicated and in accordance with NFPA 70.
   2. Provide insulated equipment grounding conductor in each feeder and branch circuit raceway. Do not use raceways as sole equipment grounding conductor.
   3. Where circuit conductor sizes are increased for voltage drop, increase size of equipment grounding conductor proportionally in accordance with NFPA 70.
   4. Unless otherwise indicated, connect wiring device grounding terminal to branch circuit equipment grounding conductor and to outlet box with bonding jumper.

5. Terminate branch circuit equipment grounding conductors on solidly bonded equipment ground bus only. Do not terminate on neutral (grounded) or isolated/insulated ground bus.
6. Provide bonding jumper across expansion or expansion/deflection fittings provided to accommodate conduit movement.

**2.02 GROUNDING AND BONDING COMPONENTS**

A. General Requirements:
   1. Provide products listed, classified, and labeled as suitable for the purpose intended.
   2. Provide products listed and labeled as complying with UL 467 where applicable.

B. Conductors for Grounding and Bonding, in Addition to Requirements of Section 260526:
   1. Use insulated copper conductors unless otherwise indicated.
      a. Exceptions:
         1) Use bare copper conductors where installed underground in direct contact with earth.
         2) Use bare copper conductors where directly encased in concrete (not in raceway).

C. Connectors for Grounding and Bonding:
   1. Description: Connectors appropriate for the application and suitable for the conductors and items to be connected; listed and labeled as complying with UL 467.
   2. Unless otherwise indicated, use exothermic welded connections for underground, concealed and other inaccessible connections.
   3. Unless otherwise indicated, use mechanical connectors, compression connectors, or exothermic welded connections for accessible connections.

**PART 3 EXECUTION**

**3.01 INSTALLATION**

A. Install products in accordance with manufacturer's instructions.

B. Perform work in accordance with NECA 1 (general workmanship).

C. Make grounding and bonding connections using specified connectors.
   1. Remove appropriate amount of conductor insulation for making connections without cutting, nicking or damaging conductors. Do not remove conductor strands to facilitate insertion into connector.
   2. Remove nonconductive paint, enamel, or similar coating at threads, contact points, and contact surfaces.
   3. Exothermic Welds: Make connections using molds and weld material suitable for the items to be connected in accordance with manufacturer's recommendations.
   4. Mechanical Connectors: Secure connections according to manufacturer's recommended torque settings.
   5. Compression Connectors: Secure connections using manufacturer's recommended tools and dies.

D. Identify grounding and bonding system components in accordance with Section 260553.

**END OF SECTION**

# SECTION 260529
# HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

## PART 1 GENERAL

### 1.1 SUMMARY

A. Section Includes:

1. Conduit supports.
2. Formed steel channel.
3. Spring steel clips.
4. Sleeves.
5. Mechanical sleeve seals.

B. Related Sections:

1. Section 033000 - Cast-In-Place Concrete: Product requirements for concrete for placement by this section.
2. Section 078400 - Firestopping: Product requirements for firestopping for placement by this section.
3. Section 270529 - Hangers and Supports for Communications Systems.
4. Section 280528.29 - Hangers and Supports for Electronic Safety and Security.

### 1.2 REFERENCES

A. ASTM International:

1. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
2. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.
3. ASTM E814 - Standard Test Method for Fire Tests of Through-Penetration Fire Stops.
4. ASTM E1966 - Standard Test Method for Fire-Resistive Joint Systems.

B. FM Global:

1. FM - Approval Guide, A Guide to Equipment, Materials & Services Approved By Factory Mutual Research For Property Conservation.

C. National Fire Protection Association:

1. NFPA 70 - National Electrical Code.

D. Underwriters Laboratories Inc.:

1. UL 263 - Fire Tests of Building Construction and Materials.
2. UL 723 - Tests for Surface Burning Characteristics of Building Materials.
3. UL 1479 - Fire Tests of Through-Penetration Firestops.

4. UL 2079 - Tests for Fire Resistance of Building Joint Systems.
5. UL - Fire Resistance Directory.

E. Intertek Testing Services (Warnock Hersey Listed):

1. WH - Certification Listings.

## 1.3 SYSTEM DESCRIPTION

A. Firestopping Materials: Comply with requirements of Section 078400.

## 1.4 PERFORMANCE REQUIREMENTS

A. Firestopping Materials: Comply with requirements of Section 078400.

## 1.5 SUBMITTALS

A. Section 013300 - Submittal Procedures: Requirements for submittals.

B. Shop Drawings: Indicate system layout with location and detail of trapeze hangers.

C. Product Data:

1. Hangers and Supports: Submit manufacturers catalog data including load capacity.

D. Design Data: Indicate load carrying capacity of trapeze hangers and hangers and supports.

E. Manufacturer's Installation Instructions:

1. Hangers and Supports: Submit special procedures and assembly of components.

F. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

## 1.6 QUALITY ASSURANCE

A. Surface Burning Characteristics: Maximum 25/450 flame spread/smoke developed index when tested in accordance with ASTM E84.

## 1.7 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three years experience.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Section 016000 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.

B. Accept materials on site in original factory packaging, labeled with manufacturer's identification.

C. Protect from weather and construction traffic, dirt, water, chemical, and mechanical damage, by storing in original packaging.

1.9 ENVIRONMENTAL REQUIREMENTS

A. Section 016000 - Product Requirements: Environmental conditions affecting products on site.

PART 2 PRODUCTS

2.1 CONDUIT SUPPORTS

A. Conduit clamps - general purpose: One hole malleable iron for surface mounted conduits.

B. Cable Ties: High strength nylon temperature rated to 185 degrees F (85 degrees C). Self locking.

2.2 FORMED STEEL CHANNEL

A. Product Description: Galvanized 12 gage (2.8 mm) thick steel. With holes 1-1/2 inches (38 mm) on center.

2.3 SPRING STEEL CLIPS

A. Product Description: Mounting hole and screw closure.

2.4 SLEEVES

A. Sleeves for Cable and Conduit Through Non-fire Rated Floors: 18 gage (1.2 mm) thick galvanized steel.

B. Sleeves for Cable and Conduit Through Non-fire Rated Beams, Walls, Footings, and Potentially Wet Floors: Steel pipe or 18 gage thick galvanized steel.

C. Sleeves for Cable and Conduit Through Fire Rated and Fire Resistive Floors and Walls, and Fire Proofing: Prefabricated fire rated sleeves including seals, UL listed.

## 2.5 MECHANICAL SLEEVE SEALS

A. Product Description: Modular mechanical type, consisting of interlocking synthetic rubber links shaped to continuously fill annular space between object and sleeve, connected with bolts and pressure plates causing rubber sealing elements to expand when tightened, providing watertight seal and electrical insulation.

# PART 3 EXECUTION

## 3.1 EXAMINATION

A. Section 013000 - Administrative Requirements: Verification of existing conditions before starting work.

B. Verify openings are ready to receive sleeves.

## 3.2 INSTALLATION - HANGERS AND SUPPORTS

A. Anchors and Fasteners:

1. Concrete Structural Elements: Provide expansion anchors or powder actuated anchors.
2. Steel Structural Elements: Provide beam clamps, spring steel clips, steel ramset fasteners, and welded fasteners.
3. Concrete Surfaces: Provide self-drilling anchors and expansion anchors.
4. Hollow Masonry, Plaster, and Gypsum Board Partitions: Provide toggle bolts and hollow wall fasteners.
5. Solid Masonry Walls: Provide expansion anchors and preset inserts.
6. Sheet Metal: Provide sheet metal screws.
7. Wood Elements: Provide wood screws.

B. Inserts:

1. Install inserts for placement in concrete forms.
2. Install inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams.
3. Provide hooked rod to concrete reinforcement section for inserts carrying pipe over 4 inches.
4. Where concrete slabs form finished ceiling, locate inserts flush with slab surface.
5. Where inserts are omitted, drill through concrete slab from below and provide through-bolt with recessed square steel plate and nut recessed into and grouted flush with slab.

C. Install conduit and raceway support and spacing in accordance with NEC.

D. Do not fasten supports to pipes, ducts, mechanical equipment, or conduit.

E. Install multiple conduit runs on common hangers.

F. Supports:

1. Fabricate supports from structural steel or formed steel channel. Install hexagon head bolts to present neat appearance with adequate strength and rigidity. Install spring lock washers under nuts.
2. Install surface mounted cabinets and panelboards with minimum of four anchors.
3. In wet and damp locations install steel channel supports to stand cabinets and panelboards 1 inch (25 mm) off wall.
4. Support vertical conduit at every floor.

## 3.3 INSTALLATION - EQUIPMENT BASES AND SUPPORTS

A. Provide housekeeping pads of concrete, minimum 3-1/2 inches thick and extending 6 inches beyond supported equipment. Refer to Section 033000.

B. Using templates furnished with equipment, install anchor bolts, and accessories for mounting and anchoring equipment.

C. Construct supports of steel members. Brace and fasten with flanges bolted to structure.

## 3.4 INSTALLATION - SLEEVES

A. Exterior watertight entries: Seal with adjustable interlocking rubber links.

B. Conduit penetrations not required to be watertight: Sleeve and fill with silicon foam.

C. Set sleeves in position in forms. Provide reinforcing around sleeves.

D. Size sleeves large enough to allow for movement due to expansion and contraction. Provide for continuous insulation wrapping.

E. Extend sleeves through floors 1 inch above finished floor level. Caulk sleeves.

F. Where conduit or raceway penetrates floor, ceiling, or wall, close off space between conduit or raceway and adjacent work with fire stopping insulation and caulk airtight. Provide close fitting metal collar or escutcheon covers at both sides of penetration.

G. Install chrome plated steel escutcheons at finished surfaces.

## 3.5 FIELD QUALITY CONTROL

A. Section 017000 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.

## 3.6 CLEANING

A. Section 017000 - Execution and Closeout Requirements: Requirements for cleaning.

## 3.7 PROTECTION OF FINISHED WORK

A. Section 017000 - Execution and Closeout Requirements: Requirements for protecting finished Work.

B. Protect adjacent surfaces from damage by material installation.

END OF SECTION

# SECTION 260533
# RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

## PART 1 GENERAL

### 1.1 SUMMARY

A. Section includes conduit and tubing, surface raceways, wireways, outlet boxes, pull and junction boxes, and handholes.

B. Related Sections:

1. Section 260526 - Grounding and Bonding for Electrical Systems.
2. Section 260529 - Hangers and Supports for Electrical Systems.
3. Section 262726 - Wiring Devices.

### 1.2 REFERENCES

A. American National Standards Institute:

1. ANSI C80.1 - Rigid Steel Conduit, Zinc Coated.
2. ANSI C80.3 - Specification for Electrical Metallic Tubing, Zinc Coated.

B. National Electrical Manufacturers Association:

1. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).
2. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies.
3. NEMA OS 1 - Sheet Steel Outlet Boxes, Device Boxes, Covers, and Box Supports.
4. NEMA OS 2 - Nonmetallic Outlet Boxes, Device Boxes, Covers, and Box Supports.

### 1.3 SYSTEM DESCRIPTION

A. Raceway and boxes located as indicated on Drawings, and at other locations required for splices, taps, wire pulling, equipment connections, and compliance with regulatory requirements. Raceway and boxes are shown in approximate locations unless dimensioned. Provide raceway to complete wiring system.

B. Underground Areas Exposed to Vehicular Traffic: Under driveways or other areas with vehicular traffic, provide PVC-coated intermediate metal conduit. Provide traffic-rated cast metal boxes.

C. In or Under Slab on Grade: Provide rigid metal conduit. Provide cast or nonmetallic metal boxes.

D. Outdoor Locations, Above Grade: Provide rigid steel conduit. Provide cast metal or nonmetallic outlet, pull, and junction boxes.

E. Wet and Damp Locations: Provide rigid metal conduit. Provide cast metal or nonmetallic outlet, junction, and pull boxes. Provide flush mounting outlet box in finished areas.

F. Concealed Dry Locations: Provide electrical metallic tubing. Provide sheet-metal boxes. Provide flush mounting outlet box in finished areas. Provide hinged enclosure for large pull boxes.

G. Exposed Dry Locations: Provide intermediate metal conduit. Provide sheet-metal boxes. Provide flush mounting outlet box in finished areas. Provide hinged enclosure for large pull boxes.

## 1.4 DESIGN REQUIREMENTS

A. Minimum Raceway Size: 3/4 inch unless otherwise specified.

## 1.5 SUBMITTALS

A. Section 013300 - Submittal Procedures: Submittal procedures.

B. Product Data: Submit for the following:

1. Rigid metal conduit and fittings.
2. Conduit bodies.
3. Junction boxes.

C. Manufacturer's Installation Instructions: Submit application conditions and limitations of use stipulated by Product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, and installation of Product.

## 1.6 CLOSEOUT SUBMITTALS

A. Section 017000 - Execution and Closeout Requirements: Closeout procedures..

## 1.7 DELIVERY, STORAGE, AND HANDLING

A. Section 016000 - Product Requirements: Product storage and handling requirements.

B. Protect conduit from corrosion and entrance of debris by storing above grade. Provide appropriate covering.

1.8 COORDINATION

A. Section 013000 - Administrative Requirements: Coordination and project conditions.

B. Coordinate installation of outlet boxes for equipment connected under Section 260503.

C. Coordinate mounting heights, orientation and locations of outlets mounted above counters, benches, and backsplashes.

PART 2 PRODUCTS

2.1 METAL CONDUIT

A. Rigid MetalConduit: ANSI C80.1.

B. Fittings and Conduit Bodies: NEMA FB 1; material to match conduit.

2.2 OUTLET BOXES

A. Sheet Metal Outlet Boxes: NEMA OS 1, galvanized steel.

1. Luminaire and Equipment Supporting Boxes: Rated for weight of equipment supported; furnish 1/2 inch male fixture studs where required.
2. Concrete Ceiling Boxes: Concrete type.

B. Nonmetallic Outlet Boxes: NEMA OS 2.

C. Cast Boxes: NEMA FB 1, Type FD, cast feralloy. Furnish gasketed cover by box manufacturer. Furnish threaded hubs.

D. Wall Plates for Finished Areas: As specified in Section 262726.

E. Wall Plates for Unfinished Areas: Furnish gasketed cover.

2.3 JUNCTION BOXES

A. Sheet Metal Boxes: NEMA OS 1, galvanized steel.

B. Surface Mounted Cast Metal Box: NEMA 250, Type 4; flat-flanged, surface mounted junction box:

1. Material: Galvanized cast iron.
2. Cover: Furnish with ground flange, neoprene gasket, and stainless steel cover screws.

PART 3 EXECUTION

## 3.1 EXAMINATION

A. Section 013000 - Administrative Requirements: Coordination and project conditions.

B. Verify outlet locations and routing and termination locations of raceway prior to rough-in.

## 3.2 EXISTING WORK

A. Remove exposed abandoned raceway, including abandoned raceway above accessible ceiling finishes. Cut raceway flush with walls and floors, and patch surfaces.

B. Remove concealed abandoned raceway to its source.

C. Disconnect abandoned outlets and remove devices. Remove abandoned outlets when raceway is abandoned and removed. Install blank cover for abandoned outlets not removed.

D. Maintain access to existing boxes and other installations remaining active and requiring access. Modify installation or provide access panel.

E. Extend existing raceway and box installations using materials and methods compatible with existing electrical installations, or as specified.

F. Clean and repair existing raceway and boxes to remain or to be reinstalled.

## 3.3 INSTALLATION

A. Ground and bond raceway and boxes in accordance with Section 260526.

B. Fasten raceway and box supports to structure and finishes in accordance with Section 260529.

C. Arrange raceway and boxes to maintain headroom and present neat appearance.

## 3.4 INSTALLATION - RACEWAY

A. Fasten together metal conduits, enclosures, and raceways to provide electrical continuity and firm mechanical assembly.

B. Avoid use of dissimilar metals throughout system to eliminate electrolysis, where dissimilar metals are in contact, coat surfaces with corrosion inhibiting compound before assembling.

C. Provide nylon pull cord in all empty conduits. Test conduits required to be left empty, with ball mandrel.

D. Raceway routing is shown in approximate locations unless dimensioned. Route to complete wiring system.

E. Arrange raceway supports to prevent misalignment during wiring installation.

F. Support raceway using galvanized steel or malleable iron straps for surface mounting.

G. Route exposed raceway parallel and perpendicular to walls.

H. Route raceway installed above accessible ceilings parallel and perpendicular to walls.

I. Maintain clearance between raceway and piping for maintenance purposes.

J. Maintain 12 inch clearance between raceway and surfaces with temperatures exceeding 104 degrees F.

K. Cut conduit square using saw or pipe cutter; de-burr cut ends.

L. Bring conduit to shoulder of fittings; fasten securely.

M. Join nonmetallic conduit using cement as recommended by manufacturer. Wipe nonmetallic conduit dry and clean before joining. Apply full even coat of cement to entire area inserted in fitting. Allow joint to cure for minimum 20 minutes.

N. Install conduit hubs or sealing locknuts to fasten conduit to sheet metal boxes in damp and wet locations and to cast boxes.

O. Install no more than equivalent of three 90 degree bends between boxes. Install conduit bodies to make sharp changes in direction, as around beams. Install factory elbows for bends in metal conduit larger than 2 inch size.

P. Avoid moisture traps; install junction box with drain fitting at low points in conduit system.

Q. Install fittings to accommodate expansion and deflection where raceway crosses expansion joints.

R. Install suitable pull string or cord in each empty raceway except sleeves and nipples.

S. Install suitable caps to protect installed conduit against entrance of dirt and moisture.

## 3.5 INSTALLATION - BOXES

A. Install wall mounted boxes at elevations to accommodate mounting heights specified in section for outlet device.

B. Adjust box location up to 10 feet prior to rough-in to accommodate intended purpose.

C. Orient boxes to accommodate wiring devices oriented as specified in Section 262726.

D. Install pull boxes and junction boxes above accessible ceilings and in unfinished areas only.

E. In Accessible Ceiling Areas: Install outlet and junction boxes no more than 6 inches from ceiling access panel or from removable recessed luminaire.

F. Locate flush mounting box in masonry wall to require cutting of masonry unit corner only. Coordinate masonry cutting to achieve neat opening.

G. Do not install flush mounting box back-to-back in walls; install with minimum 6 inches separation. Install with minimum 24 inches separation in acoustic rated walls.

H. Secure flush mounting box to interior wall and partition studs. Accurately position to allow for surface finish thickness.

I. Install stamped steel bridges to fasten flush mounting outlet box between studs.

J. Install flush mounting box without damaging wall insulation or reducing its effectiveness.

K. Install adjustable steel channel fasteners for hung ceiling outlet box.

L. Do not fasten boxes to ceiling support wires or other piping systems.

M. Support boxes independently of conduit.

N. Install gang box where more than one device is mounted together. Do not use sectional box.

O. Install gang box with plaster ring for single device outlets.

## 3.6 INTERFACE WITH OTHER PRODUCTS

A. Install conduit to preserve fire resistance rating of partitions and other elements, using materials and methods in accordance with Section 078400.

B. Locate outlet boxes to allow luminaires positioned as indicated on Drawings.

C. Align adjacent wall mounted outlet boxes for switches, thermostats, and similar devices.

## 3.7 ADJUSTING

A. Section 017000 - Execution and Closeout Requirements: Testing, adjusting, and balancing.

B. Adjust flush-mounting outlets to make front flush with finished wall material.

C. Install knockout closures in unused openings in boxes.

## 3.8 CLEANING

A. Section 017000 - Execution and Closeout Requirements: Final cleaning.

B. Clean interior of boxes to remove dust, debris, and other material.

C. Clean exposed surfaces and restore finish.

END OF SECTION

# SECTION 265100
# INTERIOR LIGHTING

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Interior luminaires.

B. Exit signs.

### 1.02 RELATED REQUIREMENTS

A. Section 260529 - Hangers and Supports for Electrical Systems.

B. Section 260533.16 - Boxes for Electrical Systems.

C. Section 262726 - Wiring Devices: Manual wall switches and wall dimmers.

### 1.03 REFERENCE STANDARDS

A. IES LM-63 - IESNA Standard File Format for Electronic Transfer of Photometric Data and Related Information 2002 (Reaffirmed 2008).

B. IES LM-79 - Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products 2008.

C. IES LM-80 - Approved Method: Measuring Luminous Flux and Color Maintenance of LED Packages, Arrays, and Modules 2015, with Errata (2017).

D. NECA 1 - Standard for Good Workmanship in Electrical Construction 2015.

E. NECA/IESNA 500 - Standard for Installing Indoor Commercial Lighting Systems 2006.

F. NECA/IESNA 502 - Standard for Installing Industrial Lighting Systems 2006.

G. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

H. NFPA 101 - Life Safety Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

I. UL 924 - Emergency Lighting and Power Equipment Current Edition, Including All Revisions.

J. UL 1598 - Luminaires Current Edition, Including All Revisions.

K. UL 8750 - Light Emitting Diode (LED) Equipment for Use in Lighting Products Current Edition, Including All Revisions.

### 1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Coordinate the installation of luminaires with mounting surfaces installed under other sections or by others. Coordinate the work with placement of supports, anchors, etc. required for mounting. Coordinate compatibility of luminaires and associated trims with mounting surfaces at installed locations.
   2. Coordinate the placement of luminaires with structural members, ductwork, piping, equipment, diffusers, fire suppression system components, and other potential conflicts installed under other sections or by others.
   3. Coordinate the placement of exit signs with furniture, equipment, signage or other potential obstructions to visibility installed under other sections or by others.
   4. Notify Architect of any conflicts or deviations from Contract Documents to obtain direction prior to proceeding with work.

### 1.05 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Shop Drawings:
   1. Indicate dimensions and components for each luminaire that is not a standard product of the manufacturer.
   2. Provide photometric calculations where luminaires are proposed for substitution upon request.

C. Product Data: Provide manufacturer's standard catalog pages and data sheets including detailed information on luminaire construction, dimensions, ratings, finishes, mounting requirements, listings, service conditions, photometric performance, installed accessories, and ceiling compatibility; include model number nomenclature clearly marked with all proposed features.
   1. LED Luminaires:
      a. Include estimated useful life, calculated based on IES LM-80 test data.
      b. Include IES LM-79 test report upon request.
   2. Provide electronic files of photometric data certified by a National Voluntary Laboratory Accreditation Program (NVLAP) lab or independent testing agency in IES LM-63 standard format upon request.
   3. Lamps: Include rated life, color temperature, color rendering index (CRI), and initial and mean lumen output.

D. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

E. Operation and Maintenance Data: Instructions for each product including information on replacement parts.

F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 016000 - Product Requirements, for additional provisions.

**1.06 QUALITY ASSURANCE**

A. Comply with requirements of NFPA 70.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

C. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

**1.07 DELIVERY, STORAGE, AND PROTECTION**

A. Receive, handle, and store products according to NECA/IESNA 500 (commercial lighting), NECA/IESNA 502 (industrial lighting), and manufacturer's written instructions.

B. Keep products in original manufacturer's packaging and protect from damage until ready for installation.

**1.08 FIELD CONDITIONS**

A. Maintain field conditions within manufacturer's required service conditions during and after installation.

**1.09 WARRANTY**

A. See Section 017800 - Closeout Submittals, for additional warranty requirements.

B. Provide three year manufacturer warranty for LED luminaires, including drivers, unless noted otherwise on Drawings.

C. Provide five year pro-rata warranty for batteries for emergency lighting units.

## PART 2 PRODUCTS

### 2.01 LUMINAIRE TYPES

A. Furnish products as indicated in luminaire schedule included on the drawings.

B. Substitutions: See Section 016000 - Product Requirements except where individual luminaire types are designated with substitutions not permitted.

### 2.02 LUMINAIRES

A. Manufacturers:
   1. Acuity Brands, Inc: www.acuitybrands.com/#sle.
   2. Alloy LED; www.alloyled.com/#sle.
   3. Cooper Lighting, a division of Cooper Industries: www.cooperindustries.com/#sle.
   4. Hubbell Lighting, Inc: www.hubbelllighting.com/#sle.
   5. Philips Lighting North America Corporation; www.lightingproducts.philips.com/#sle.

B. Provide products that comply with requirements of NFPA 70.

C. Provide products that are listed and labeled as complying with UL 1598, where applicable.

D. Provide products listed, classified, and labeled as suitable for the purpose intended.

E. Unless otherwise indicated, provide complete luminaires including lamp(s) and all sockets, ballasts, reflectors, lenses, housings and other components required to position, energize and protect the lamp and distribute the light.

F. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, hardware, supports, trims, accessories, etc. as necessary for a complete operating system.

G. Provide products suitable to withstand normal handling, installation, and service without any damage, distortion, corrosion, fading, discoloring, etc.

H. LED Luminaires:
   1. Components: UL 8750 recognized or listed as applicable.
   2. Tested in accordance with IES LM-79 and IES LM-80.
   3. LED Estimated Useful Life: Minimum of 50,000 hours at 70 percent lumen maintenance, calculated based on IES LM-80 test data.

### 2.03 EXIT SIGNS

A. Description: Exit signs complying with NFPA 101 and applicable state and local codes, and listed and labeled as complying with UL 924.
   1. Number of Faces: Single- or double-face as indicated or as required for installed location.
   2. Directional Arrows: As indicated or as required for installed location.

B. Powered Exit Signs: Internally illuminated with LEDs unless otherwise indicated.
   1. Manufacturers:
      a. Acuity Brands, Inc: www.acuitybrands.com/#sle.
      b. Cooper Lighting, a division of Cooper Industries: www.cooperindustries.com/#sle.
      c. Hubbell Lighting, Inc: www.hubbelllighting.com/#sle.
      d. Philips Lighting North America Corporation; www.lightingproducts.philips.com/#sle.

## PART 3 EXECUTION

### 3.01 EXAMINATION

A. Verify that field measurements are as indicated.

B. Verify that outlet boxes are installed in proper locations and at proper mounting heights and are properly sized to accommodate conductors in accordance with NFPA 70.

C. Verify that suitable support frames are installed where required.

D. Verify that branch circuit wiring installation is completed, tested, and ready for connection to luminaires.

E. Verify that conditions are satisfactory for installation prior to starting work.

**3.02 INSTALLATION**

A. Coordinate locations of outlet boxes provided under Section 260533.16 as required for installation of luminaires provided under this section.

B. Perform work in accordance with NECA 1 (general workmanship).

C. Install products in accordance with manufacturer's instructions.

D. Install luminaires securely, in a neat and workmanlike manner, as specified in NECA 500 (commercial lighting) and NECA 502 (industrial lighting).

E. Provide required support and attachment in accordance with Section 260529.

F. Install luminaires plumb and square and aligned with building lines and with adjacent luminaires.

G. Install accessories furnished with each luminaire.

H. Bond products and metal accessories to branch circuit equipment grounding conductor.

I. Exit Signs:
   1. Unless otherwise indicated, connect unit to unswitched power from same circuit feeding normal lighting in same room or area. Bypass local switches, contactors, or other lighting controls.

J. Install lamps in each luminaire.

**3.03 FIELD QUALITY CONTROL**

A. See Section 014000 - Quality Requirements, for additional requirements.

B. Inspect each product for damage and defects.

C. Operate each luminaire after installation and connection to verify proper operation.

D. Correct wiring deficiencies and repair or replace damaged or defective products.

**3.04 ADJUSTING**

A. Aim and position adjustable luminaires to achieve desired illumination as indicated or as directed by Architect. Secure locking fittings in place.

B. Exit Signs with Field-Selectable Directional Arrows: Set as indicated or as required to properly designate egress path as directed by Architect or authority having jurisdiction.

**3.05 CLEANING**

A. Clean surfaces according to NECA 500 (commercial lighting), NECA 502 (industrial lighting), and manufacturer's instructions to remove dirt, fingerprints, paint, or other foreign material and restore finishes to match original factory finish.

**3.06 CLOSEOUT ACTIVITIES**

A. See Section 017800 - Closeout Submittals, for closeout submittals.

**3.07 PROTECTION**

A. Protect installed luminaires from subsequent construction operations.

**END OF SECTION**

# SECTION 265600
# EXTERIOR LIGHTING

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Exterior luminaires.

B. Luminaire accessories.

### 1.02 RELATED REQUIREMENTS

A. Section 260529 - Hangers and Supports for Electrical Systems.

B. Section 260533.16 - Boxes for Electrical Systems.

C. Section 262726 - Wiring Devices: Receptacles for installation in poles.

### 1.03 REFERENCE STANDARDS

A. IEEE C2 - National Electrical Safety Code 2017.

B. IES LM-63 - IESNA Standard File Format for Electronic Transfer of Photometric Data and Related Information 2002 (Reaffirmed 2008).

C. IES LM-79 - Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products 2008.

D. IES LM-80 - Approved Method: Measuring Luminous Flux and Color Maintenance of LED Packages, Arrays, and Modules 2015, with Errata (2017).

E. NECA 1 - Standard for Good Workmanship in Electrical Construction 2015.

F. NECA/IESNA 501 - Standard for Installing Exterior Lighting Systems 2006.

G. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

H. UL 1598 - Luminaires Current Edition, Including All Revisions.

I. UL 8750 - Light Emitting Diode (LED) Equipment for Use in Lighting Products Current Edition, Including All Revisions.

### 1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Shop Drawings:
   1. Indicate dimensions and components for each luminaire that is not a standard product of the manufacturer.
   2. Provide photometric calculations where luminaires are proposed for substitution upon request.

C. Product Data: Provide manufacturer's standard catalog pages and data sheets including detailed information on luminaire construction, dimensions, ratings, finishes, mounting requirements, listings, service conditions, photometric performance, weight, effective projected area (EPA), and installed accessories; include model number nomenclature clearly marked with all proposed features.
   1. LED Luminaires:
      a. Include estimated useful life, calculated based on IES LM-80 test data.
      b. Include IES LM-79 test report upon request.
   2. Provide electronic files of photometric data certified by a National Voluntary Laboratory Accreditation Program (NVLAP) lab or independent testing agency in IES LM-63 standard format upon request.
   3. Lamps: Include rated life and initial and mean lumen output.

D. Field Quality Control Reports.
   1. Include test report indicating measured illumination levels.

E. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, installation, and starting of product.

F. Operation and Maintenance Data: Instructions for each product including information on replacement parts.

**1.05 QUALITY ASSURANCE**

A. Comply with requirements of NFPA 70.

B. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

**1.06 DELIVERY, STORAGE, AND HANDLING**

A. Receive, handle, and store products according to NECA/IESNA 501 and manufacturer's written instructions.

B. Keep products in original manufacturer's packaging and protect from damage until ready for installation.

**1.07 WARRANTY**

A. See Section 017800 - Closeout Submittals, for additional warranty requirements.

B. Provide three year manufacturer warranty for all LED luminaires, including drivers, unless a longer warranty term is required on the Lighting Schedule on the Drawings.

**PART 2 PRODUCTS**

**2.01 LUMINAIRE TYPES**

A. Furnish products as indicated in luminaire schedule included on the drawings.

B. Substitutions: See Section 016000 - Product Requirements.

**2.02 LUMINAIRES**

A. Manufacturers:
   1. Acuity Brands, Inc: www.acuitybrands.com/#sle.
   2. Alloy LED; www.alloyled.com/#sle.
   3. Cooper Lighting, a division of Cooper Industries: www.cooperindustries.com/#sle.
   4. Philips Lighting North America Corporation; www.lightingproducts.philips.com/#sle.
   5. ECO Parking Technologies; www.ecoparkingtechnologies.com.

B. Provide products that comply with requirements of NFPA 70.

C. Provide products that are listed and labeled as complying with UL 1598, where applicable.

D. Provide products listed, classified, and labeled as suitable for the purpose intended.

E. Unless otherwise indicated, provide complete luminaires including lamp(s) and all sockets, ballasts, reflectors, lenses, housings and other components required to position, energize and protect the lamp and distribute the light.

F. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, hardware, poles, foundations, supports, trims, accessories, etc. as necessary for a complete operating system.

G. Provide products suitable to withstand normal handling, installation, and service without any damage, distortion, corrosion, fading, discoloring, etc.

H. Provide luminaires listed and labeled as suitable for wet locations where indicated .

I. LED Luminaires:
   1. Components: UL 8750 recognized or listed as applicable.
   2. Tested in accordance with IES LM-79 and IES LM-80.
   3. LED Estimated Useful Life: Minimum of 50,000 hours at 70 percent lumen maintenance, calculated based on IES LM-80 test data.

J. Exposed Hardware: Stainless steel.

## PART 3 EXECUTION

### 3.01 EXAMINATION

A. Verify that field measurements are as indicated.

B. Verify that outlet boxes are installed in proper locations and at proper mounting heights and are properly sized to accommodate conductors in accordance with NFPA 70.

C. Verify that suitable support frames are installed where required.

D. Verify that branch circuit wiring installation is completed, tested, and ready for connection to luminaires.

E. Verify that conditions are satisfactory for installation prior to starting work.

### 3.02 INSTALLATION

A. Coordinate locations of outlet boxes provided under Section 260533.16 as required for installation of luminaires provided under this section.

B. Perform work in accordance with NECA 1 (general workmanship).

C. Install products in accordance with manufacturer's instructions.

D. Install luminaires in accordance with NECA/IESNA 501.

E. Provide required support and attachment in accordance with Section 260529.

F. Install luminaires plumb and square and aligned with building lines and with adjacent luminaires.

G. Wall-Mounted Luminaires: Unless otherwise indicated, specified mounting heights are to center of luminaire.

H. Pole-Mounted Luminaires:
   1. Maintain the following minimum clearances:
      a. Comply with IEEE C2.
      b. Comply with utility company requirements.
   2. Grounding:
      a. Bond luminaires, metal accessories, metal poles, and foundation reinforcement to branch circuit equipment grounding conductor.
   3. Install separate service conductors, 12 AWG copper, from each luminaire down to handhole for connection to branch circuit conductors.

I. Install accessories furnished with each luminaire.

J. Bond products and metal accessories to branch circuit equipment grounding conductor.

K. Install lamps in each luminaire.

### 3.03 FIELD QUALITY CONTROL

A. See Section 014000 - Quality Requirements, for additional requirements.

B. Inspect each product for damage and defects.

C. Operate each luminaire after installation and connection to verify proper operation.

D. Correct wiring deficiencies and repair or replace damaged or defective products. Repair or replace excessively noisy ballasts as determined by Architect.

E. Measure illumination levels at night with calibrated meters to verify compliance with performance requirements. Record test results in written report to be included with submittals.

**3.04 ADJUSTING**

A. Aim and position adjustable luminaires to achieve desired illumination as indicated or as directed by Architect. Secure locking fittings in place.

B. Luminaires with Field-Rotatable Optics: Position optics according to manufacturer's instructions to achieve lighting distribution as indicated or as directed by Architect.

**3.05 CLEANING**

A. Clean surfaces according to NECA/IESNA 501 and manufacturer's instructions to remove dirt, fingerprints, paint, or other foreign material and restore finishes to match original factory finish.

**3.06 CLOSEOUT ACTIVITIES**

A. See Section 017800 - Closeout Submittals, for closeout submittals.

B. Just prior to Substantial Completion, replace all lamps that have failed.

**3.07 PROTECTION**

A. Protect installed luminaires from subsequent construction operations.

**END OF SECTION**