

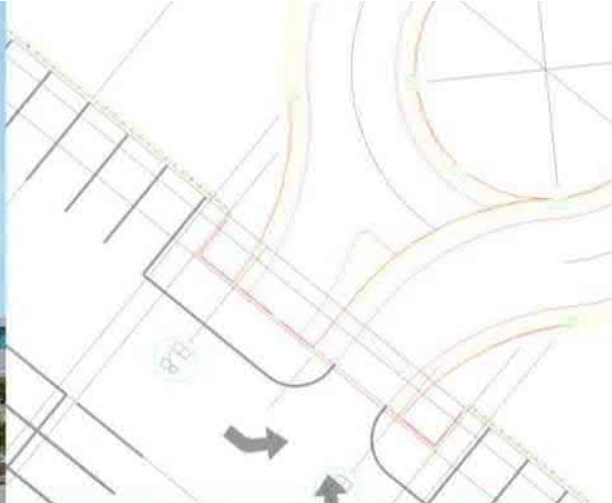


Manchester·Boston

REGIONAL AIRPORT

**PARKING GARAGE: LEVEL-4 FLOOR & LEVEL-3 CEILING
SEALANTS, WATERPROOFING, & MISCELLANEOUS REPAIRS**

**CONTRACT AND PROJECT SPECIFICATIONS
FY22-805-50**



AECOM

1155 Elm Street, Suite 401
Manchester, NH 03101

April 2022

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TABLE OF CONTENTS

DIVISION 00	BID FORMS & CONTRACT REQUIREMENTS
SECTION 00030	NOTICE TO BIDDERS
SECTION 00100	INSTRUCTIONS TO BIDDERS
SECTION 00130	PRE-BID CONFERENCE
SECTION 00300	PROPOSAL (BID) DOCUMENTS
SECTION 00310	BID BOND
SECTION 00500	AGREEMENT DOCUMENTS
SECTION 00510	PERFORMANCE BOND
SECTION 00520	PAYMENT BONDS
SECTION 00710	DEFINITION OF TERMS
SECTION 00720	CONDITIONS RELATING TO THE SCOPE OF WORK
SECTION 00730	CONDITIONS RELATING TO CONTROL OF WORK
SECTION 00731	SPECIFICATIONS AND DRAWINGS
SECTION 00750	LEGAL REGULATIONS AND RESPONSIBILITY TO PUBLIC
SECTION 00760	PROSECUTION AND PROGRESS
SECTION 00822	INSURANCE REQUIREMENTS
SECTION 00826	CLEAN AIR AND WATER POLLUTION CONTROL REQUIREMENTS
SECTION 00840	LIQUIDATED DAMAGES AND EXTENSIONS
SECTION 00850	DISPUTES/CLAIMS
DIVISION 01	GENERAL REQUIREMENTS
SECTION 01100	SUMMARY OF WORK
SECTION 01140	WORK RESTRICTIONS
SECTION 01250	CONTRACT MODIFICATION PROCEDURES
SECTION 01270	UNIT PRICES
SECTION 01280	ALLOWANCES
SECTION 01290	PAYMENT PROCEDURES
SECTION 01310	PROJECT MANAGEMENT AND COORDINATION
SECTION 01320	CONSTRUCTION PROGRESS DOCUMENTATION
SECTION 01322	PHOTOGRAPHIC DOCUMENTATION
SECTION 01330	SUBMITTAL PROCEDURES
SECTION 01400	QUALITY REQUIREMENTS
SECTION 01420	REFERENCES

SECTION 01500	TEMPORARY FACILITIES AND CONTROLS
SECTION 01540	SITE SECURITY
SECTION 01545	SAFETY PROGRAM
SECTION 01600	PRODUCT REQUIREMENTS
SECTION 01700	EXECUTION REQUIREMENTS
SECTION 01720	PROJECT RECORD DOCUMENTS
SECTION 01730	SELECTIVE DEMOLITION
SECTION 01731	CUTTING AND PATCHING
SECTION 01740	GUARANTEES / WARRANTIES AND BONDS
SECTION 01770	CLOSEOUT PROCEDURES

Technical Specifications:

DIVISION 02	WORK ITEM SCOPES & SITEWORK
SECTION 02000	WORK ITEM SCOPES
SECTION 02840	TRAFFIC DELINEATORS
DIVISION 03	CONCRETE
SECTION 03700	EMBEDDED GALVANIC ANODES
SECTION 03732	CONCRETE REPAIR
SECTION 03930	EPOXY-INJECTED CRACK REPAIR
SECTION 03933	PENETRATING CORROSION INHIBITING IMPREGNATION COATING
DIVISION 07	THERMAL AND MOISTURE PROTECTION
SECTION 07180	TRAFFIC COATINGS
SECTION 07190	PENETRATING CONCRETE SEALER WITH MCI
SECTION 07920	JOINT SEALANTS

Manchester • Boston Regional Airport Project Documents

City of Manchester - Department of Aviation

Division 00: BID FORMS & CONTRACT REQUIREMENTS

**PARKING GARAGE: LEVEL-4 FLOOR & LEVEL-3 CEILING
SEALANTS, WATERPROOFING, & MISCELLANEOUS REPAIRS**

FY22-805-50



APRIL 2022

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**SECTION 00030
NOTICE TO BIDDERS**

**PUBLIC NOTICE - ADVERTISEMENT FOR BIDS
CITY OF MANCHESTER, NH - DEPARTMENT OF AVIATION**

NOTICE IS HEREBY GIVEN that sealed bids are sought and requested for performance of a contract, according to specifications, by the City of Manchester, Department of Aviation, Manchester • Boston Regional Airport (AIRPORT) for the following:

**MANCHESTER • BOSTON REGIONAL AIRPORT
PARKING GARAGE: LEVEL-4 FLOOR & LEVEL-3 CEILING
SEALANTS, WATERPROOFING, & MISCELLANEOUS REPAIRS**

MHT / City Bid # FY22-805-50

This project consists of concrete floor and ceiling repairs, elastomeric sealants replacements, concrete floor sealer with MCI, concrete waterproofing coatings, and miscellaneous repairs work to be performed on the Level-4 Floor and to the Ceiling of Level-3 (underside of Level-4 deck) of the existing parking garage facility at Manchester-Boston Regional Airport, Manchester, NH.

Bids will be accepted only from **Contractors that have been pre-qualified** with the Department of Aviation. Refer to the Construction Contracts information available at the Manchester-Boston Regional Airport website at <https://www.flymanchester.com/doing-business-with-mht/procurement-services/> for the pre-qualification requirement. Prequalification for this project has been completed separately from the bidding process.

Bid Documents will be available to be viewed and downloaded on **April 18, 2022**, at no cost, in Portable Document Format (.PDF) at the Manchester-Boston Regional Airport website at <https://www.flymanchester.com/doing-business-with-mht/procurement-opportunities/> .

A **Mandatory Pre-Bid Meeting and Site Tour** will be held in-person at the Airport administrative offices boardroom located on the third floor of the Airport terminal at One Airport Road, Manchester, NH on **April 26, 2022 at 1:30 pm**. Prospective Bidders shall RSVP not less 24 hours prior to the meeting through Ms. Christina Adams at the Airport Administration Office who can be reached at (603) 624-6539 or by email at cadams@flymanchester.com .

Bids will be received until and publicly opened and read aloud on **May 6, 2022 at 3:00 pm** at the Airport Administration Office on the third floor of the Airport Terminal located at One Airport Road, Manchester, NH. The contract will be awarded to lowest responsive and responsible Bidder.

Each Bidder must deposit with his/her Bid, security in the amount of 5% of the total Base Bid. A 100% performance and payment bond will be required with the execution of the contract. The Bidder shall refer to all Federal, State, and Local bidding and contract requirements within the

Documents. The AIRPORT reserves the right to waive any informality in the bidding or to reject any or all bids.

All Bid-related inquiries shall be submitted in writing and received before 3:00 pm on May 3, 2022, to John G. Goudreault, P.E., Associate Vice President at AECOM, via email to John.Goudreault@aecom.com or mail/FedEx to 1155 Elm Street, Suite 401, Manchester, NH 03101.

END OF SECTION 00030

SECTION 00100

INSTRUCTIONS TO BIDDERS

DESCRIPTION

1.1 RECEIPT AND OPENING BIDS

The City of Manchester, Department of Aviation, Manchester, New Hampshire (herein called the Owner), invites bids on the form attached hereto, all blanks of which must be appropriately filled in. Bids will be received by the Owner at the Manchester•Boston Regional Airport Administration Offices, One Airport Road, Suite 300, Manchester, New Hampshire 03103 until the time and date specified in Notice To Bidders, and then at said office will be publicly opened and read aloud.

The envelopes containing the bid must be sealed, addressed and designated as:

Bid Proposal for:
Manchester•Boston Regional Airport
Parking Garage: Level-4 Floor & Level-3 Ceiling, Sealants, Waterproofing, &
Miscellaneous Repairs
FY22-805-50

The Owner may consider irregular any bid not prepared and submitted in accordance with the provisions hereof and may waive any informalities or reject any and all bids. Any bid may be withdrawn prior to the above scheduled time for the opening of bids or authorized postponement thereof. Any bid received after the time and date specified shall not be considered. No bidder may withdraw a bid within 90 days after the actual date of the opening thereof.

1.2 DESCRIPTION OF WORK

In general, the work shall include:

The **Parking Garage: Level-4 Floor & Level-3 Ceiling Sealants, Waterproofing, & Miscellaneous Repairs Project** consists of concrete floor and ceiling repairs and elastomeric sealants replacements, concrete floor sealer with MCI, concrete waterproofing coatings, and miscellaneous repairs work to be performed on the Level-4 Floor and to the Ceiling of Level-3 (underside of Level-4 deck) of the existing parking garage facility at Manchester•Boston Regional Airport, Manchester, NH.

The on-site work shall be performed within the following period:

Beginning on or before	May 23, 2022
Completion on or before	September 30, 2022

All areas of the Airport disturbed by the Contractor's operations not within the construction limits as

set forth by the plans shall be restored at least equal to original condition at no cost to the Owner.

Attention shall be directed to the Contract Plans and Technical Specifications for specific information of the work to be performed.

1.3 ISSUANCE OF PROPOSAL (BID) FORMS

The Owner shall furnish bidders with proposal forms. All papers bound with or attached to the proposal forms are necessary parts and must not be detached.

The plans, specifications, and other documents designated in the proposal form shall be considered a part of the proposal whether attached or not.

The Owner reserves the right to refuse to issue a proposal form to a prospective bidder should such bidder be in default for any of the following reasons:

- A. Failure to comply with any pre-qualification or qualification regulations of the Owner, if such regulations are cited, or otherwise included, in the proposal as a requirement of bidding.
- B. Failure to pay, or satisfactorily settle, all bills due for labor and materials on former contracts in force (with the Owner) at the time the Owner issues the proposal to a prospective bidder.
- C. Contractor default under previous contracts with the Owner.
- D. Unsatisfactory work or performance on previous contracts with the Owner.

1.4 EXAMINATION OF PLANS, SPECIFICATIONS AND SITE

The bidder is expected to carefully examine the site of the proposed work, the proposal, plans specifications, and contract forms. Prior to submission of a bid, the bidder shall be fully satisfied as to the character, quality, and quantities of work to be performed, materials to be furnished, and as to the requirements of the proposed contract. The submission of a proposal shall be prima facie evidence that the bidder has made such examination and is satisfied as to the conditions to be encountered in performing the work and as to the requirements of the proposed contract plans, and specifications.

1.5 PREPARATION OF PROPOSAL

The bidder shall submit his/her proposal on the forms furnished by the Owner. All blank spaces in the proposal forms must be correctly filled in where indicated for each and every item. The bidder shall state the price (written in ink or typed) both in words and numerals for which he/she proposes to do the work. In case of conflict between words and numerals, the words, unless obviously incorrect, shall govern.

The bidder shall sign his/her proposal correctly and in ink. If the proposal is made by an individual, his/her name and post office address must be shown. If made by a partnership, the name and address of each member of the partnership must be shown. If made by a corporation, the person signing the

proposal shall give the name of the state under the laws of which the corporation was chartered and the name, titles, and business address of the president, secretary, and the treasurer. Anyone signing a proposal as an agent shall file evidence of his/her authority to do so and that the signature is binding upon the firm or corporation.

The following forms must be submitted by a bidder as part of the proposal:

- a. Proposal (Bid) Documents (Section 00300)
- b. Bid Security Forms (00310)

1.6 IRREGULAR PROPOSALS (BID)

Proposals shall be considered irregular for the following reasons:

- a. If the proposal is on a form other than that furnished by the Owner, or if the Owner's form is altered, or if any part of the proposal form is detached.
- b. If there are unauthorized additions, conditional or alternate prices, or irregularities of any kind which make the proposal incomplete, indefinite, or otherwise ambiguous.
- c. If the proposal is not accompanied by the proposal guaranty specified by the Owner.

The Owner reserves the right to reject any irregular proposal for any reasons and the right to waive technicalities, if such waiver is in the best interest of the Owner and conforms to local laws and ordinances pertaining to the letting of construction contracts.

1.7 PROPOSAL GUARANTY BID SECURITY

Each bid must be accompanied by a certified check of the bidder, or a bid bond prepared on the form of bid bond included in the Contract Documents, duly executed by the bidder as principal and having as Surety thereon a surety company approved by the Owner, in the amount of 5% of the bid. Such check, or collateral, shall be made payable to the Owner. The bid bond shall be executed or countersigned for the Surety by a person who has current power of attorney for the Surety.

The bid security will be returned to all except the three lowest bidders within three days after the opening of the bids, and the remaining cash, checks, or bid bonds will be returned promptly after the Owner and the accepted bidder have executed the Contract, or, if no award has been made within 100 days after the date of the opening of bids, upon demand of the bidder at any time thereafter, so long as he/she has not been notified of the acceptance of his/her bid.

1.8 DELIVERY OF PROPOSAL

Each proposal submitted shall be placed in a sealed envelope plainly marked with the project name, project number, location of airport, and name and business address of the bidder on the outside. When sent by mail, preferably registered, the sealed proposal, marked as indicated above, should be enclosed in an additional envelope. No proposal will be considered unless received at the place specified in the Notice to Bidders before the time specified for opening all bids. Proposals received after the bid opening time will be returned to the bidder unopened.

1.9 WITHDRAWAL OR REVISION OF PROPOSALS

A bidder may withdraw or revise (by withdrawal of one proposal and submission of another) a proposal provided that the bidder's request for withdrawal is received by the Owner in writing or by telegram before the time specified for opening bids. Revised proposals must be received at the place specified in the advertisement before the time specified for opening all bids. All requirements applicable to the original proposal apply to any revised proposals.

1.10 PUBLIC OPENING OF PROPOSALS

Proposals shall be opened, and read, publicly at the time and place specified in the advertisement. Bidders, their authorized agents, and other interested persons are invited to attend. Proposals that have been withdrawn (by written or telegraphic request) or received after the time specified for opening bids will be returned to the bidder unopened.

1.11 CONSIDERATION OF PROPOSALS

After the proposals are publicly opened and read, they will be compared and evaluated by the Owner.

Until the award of a contract is made, the Owner reserves the right to reject a bidder's proposal for any of the following reasons:

- a. If the proposal is irregular as specified in subsection 6 of Section 00100, titled IRREGULAR PROPOSALS.
- b. If the bidder is disqualified for any of the reasons specified in subsection 12 of Section 00100, titled DISQUALIFICATION OF BIDDERS.
- c. All bids may be rejected if the lowest responsive bid received exceeds the owner's budget estimate.

In addition, until the award of a contract is made, the Owner reserves the right to reject any or all proposals, waive technicalities, if such waiver is in the best interest of the Owner and is in conformance with applicable State and Local laws or regulations pertaining to the letting of construction contracts; advertise for new proposals; or proceed with the work otherwise. All such actions shall promote the Owner's best interests.

The Owner also reserves the right to negotiate with the lowest two bidders.

1.12 DISQUALIFICATION OF BIDDERS

A bidder shall be considered disqualified for any of the following reasons:

1. Failure to provide complete and adequate Qualification Statement documentation as required by the Owner's standard Pre-Qualification Process. The Pre-Qualification of bidders for this project has been completed separately from this bid submittal. Proposals shall only be accepted from Bidders who have completed the Pre-Qualification submittal process and have been deemed Qualified in the Owner's judgment.

2. Submitting more than one proposal from the same partnership, firm, or corporation under the same or different name.
3. Evidence of collusion among bidders. Bidders participating in such collusion shall be disqualified as bidders for any future work of the Owner until such participating bidder has been reinstated by the Owner as a pre-qualified bidder.
4. If the bidder is considered to be in "default" for any reason specified in subsection 3 of Section 00100, titled ISSUANCE OF PROPOSAL (BID) FORMS.
5. Lack of competency as revealed by the financial statement, experience, or plant and equipment statements submitted.
6. Lack of responsibility as shown by past work judged from the standpoint of workmanship and progress.
7. Uncompleted work which, in the judgment of the Owner, might hinder or prevent the prompt completion of additional work if awarded.
8. If the proposal is considered irregular in accordance with subsection 6 of Section 00100, titled IRREGULAR PROPOSALS.
9. Surety fails necessary solvency test or is shown not to have sufficient financial resources to sustain bonds.

1.13 AWARD OF CONTRACT

The award of a contract, if it is to be awarded, shall be made within 90 calendar days of the date specified for publicly opening proposals, unless otherwise specified herein.

Award of the contract shall be made by the Owner to the lowest, qualified bidder whose proposal conforms to the cited requirements of the Owner. The Owner may negotiate with the two low bidders in order to reduce the bid to fall within available funds and/or to obtain a lower amount, provided that the original intent of the procurement is not materially changed. The right to negotiate a lower total bid is a condition of the bidding documents.

1.14 CANCELLATION OF AWARD

The Owner reserves the right to cancel the award without liability to the bidder, except return of proposal guaranty, at any time before a contract has been fully executed by all parties and is approved by the Owner in accordance with subsection 18 of Section 00100, titled APPROVAL OF CONTRACT.

1.15 RETURN OF PROPOSAL GUARANTY

All proposal guaranties, except those of the three lowest bidders, will be returned immediately after the Owner has made a comparison of bids as hereinbefore specified in subsection 11 of Section 00100, titled CONSIDERATION OF PROPOSALS. Proposal guaranties of the three lowest bidders will be retained by the Owner until such time as an award is made, at which time, the unsuccessful bidders' proposal guaranties will be returned. The successful bidder's proposal guaranty will be returned as soon as the Owner receives the contract bonds as specified in subsection 16 of Section 00100, titled REQUIREMENTS OF CONTRACT BONDS.

1.16 REQUIREMENTS OF CONTRACT BONDS

At the time of the execution of the contract, the successful bidder shall furnish the Owner a Surety bond or bonds, which have been fully executed by the bidder and the Surety guaranteeing the performance of the work and the payment of all legal debts that may be incurred by reason of the Contractor's performance of the work. The Surety and the form of the bond or bonds shall be acceptable to the Owner. Unless otherwise specified in this subsection, the Surety bond or bonds shall be in a sum equal to the full amount of the Contract.

1.17 EXECUTION OF CONTRACT

It is the Owner's intent to complete the Award and Execution of the contract on or before **May 16, 2022.**

After review of the bids, the Owner intends to formally notify the Low Bidder within 1 business day. The Low Bidder will have 7 calendar days from the date of notice to procure the necessary Contract Bonds, Insurance Certificates, and prepare the Contract for Execution by the Owner.

A contract execution meeting with the Owner, Engineer, and a representative of the Apparent Qualified Low Bidder whom is authorized to sign and enter into contract, shall take place before the contract execution date. The successful Bidder shall deliver, and/or sign (execute) the necessary agreements for entering into the contract before or at the meeting, and submit a fully executed Surety bond or bonds specified in subsection 16 of Section 00100, titled REQUIREMENTS OF CONTRACT BONDS and required Insurance Certificates, at (or before) the meeting.

1.18 APPROVAL OF CONTRACT

Upon receipt of the contract and contract bond or bonds and insurance certificates that have been executed by the successful bidder, the Owner shall complete the execution of the contract in accordance with local laws or ordinances, and return the fully executed contract to the Contractor. Delivery of the fully executed contract to the Contractor shall constitute the Owner's approval to be bound by the successful bidder's proposal and the terms of the contract provided all bonding requirements are met.

1.19 FAILURE TO EXECUTE CONTRACT

Failure of the successful bidder to execute the contract and furnish an acceptable Surety bond or bonds within period specified in subsection 17 of Section 00100, titled EXECUTION OF CONTRACT, shall be just cause for cancellation of the award and forfeiture of the proposal guaranty, not as a penalty, but as liquidation of damages to the Owner.

1.20 BIDDER'S QUALIFICATIONS

All Bidders must be qualified in the judgment of the Owner. The process for qualification for this project involves sending a completed Contractor's Pre-Qualification Statement and bonding capacity information as required by the Owner's Standard Pre-Qualification process. All Bidders for projects with an estimated cost in excess of \$250,000 must be pre-qualified.

The Pre-Qualification of Bidders for this project has been completed separately from this Bid submittal.

1.21 BID MODIFICATION

Any bidder may modify his/her bid by written communication at any time prior to the schedule closing time for receipt of bids, providing such written communication is received by the Owner prior to the bid closing time. The written communication should not reveal the bid price but should provide the addition or subtraction or any other modification so that the final prices or terms will not be known by the Owner until the sealed bid is opened.

1.22 SUBCONTRACTOR LIST

Each Bidder shall provide the following information for each Subcontractor who will perform any portions of the work in excess of one tenth of one percent (0.1%) of the Bidder's total bid amount, at the request of the owner or Program Manager.

1. Name and address of Subcontractor,
2. Brief description of work to be performed under subcontract
3. Price under subcontract
4. Subcontractor's license number (electricians and plumbers)

1.23 SUBCONTRACTOR APPROVAL

The bidder is specifically advised that any person, firm, or other party to whom it is proposed to award a subcontract under this contract:

- a. Must be acceptable to the Owner, and
- b. The owner reserves the right to reject the use of any subcontractor that it deems unsatisfactory.

1.24 TIME OF COMPLETION AND LIQUIDATED DAMAGES

The bidder must agree to commence site work before the date to be specified in the written Notice to Proceed of the Owner and to fully complete the project as specified in the Contract.

Bidders must also agree to pay to the Owner liquidated damages in accordance with Section 00840

for each and every contract calendar day that the work remains incomplete or is nonconforming beyond the specified time as provided in the NTP and Contract Provisions.

1.25 SECURITY FOR FAITHFUL PERFORMANCE

Simultaneously with his/her delivery of the executed Contract, the successful bidder shall furnish Surety bonds as security for faithful performance of this Contract and for the payment of all persons performing labor on the project under this Contract and furnishing materials in connection with this Contract, as specified in the General Provisions included herein. The bonds shall be of the form provided hereinafter and shall be executed by Surety acceptable to the Owner. The bonds shall be executed by or countersigned by an agent for Surety and said agent to have current power of attorney for the Surety. Each bond shall be in the amount of 100% of Contract awarded. Contractors should also submit with all bonds evidence showing the financial strength of the Surety.

1.26 ADDENDA AND INTERPRETATIONS

No interpretation of the meaning of the plans, specifications or other pre-bid documents will be made to any bidder orally. Every request for such interpretation shall be in writing addressed to John G. Goudreault, P.E., AECOM, 1155 Elm Street, Suite 401, Manchester, NH 03101, via email to john.goudreault@aecom.com, and to be given consideration, **must be received on or before 3:00 pm on May 3, 2022.**

Any and all such interpretations and any supplemental instructions will be in the form of written addenda to the specifications which, if issued, will be emailed to all prospective bidders (at the respective email address furnished by the bidder at the mandatory pre-bid conference for such purposes), not later than five (5) working days prior to the date fixed for the opening of bids. Failure of any bidder to receive any such addendum or interpretation shall not relieve such bidder from any obligation under his/her bid as submitted. All addenda so issued shall become part of the Contract Documents.

1.27 POWER OF ATTORNEY

Attorneys-in-fact or others who sign bid bonds or contract bonds must file with each bond a certified and effectively dated copy of their power of attorney.

1.28 LAWS AND REGULATIONS

The bidder's attention is directed to the fact that all applicable Federal and State laws, municipal ordinances, and the rules and regulations of all authorities having jurisdiction over construction of the project shall apply to the Contract throughout, and they will be deemed to be included in the Contract the same as though therein written out in Full. The Contractor shall be responsible for

payment of all taxes, fees, & assessments as levied by Federal, State and Local authorities.

1.29 NOTICE OF SPECIAL CONDITIONS

Attention is particularly called to those parts of the Contract Documents which deal with the following:

- a. Inspection of work.
- b. Insurance requirements.
- c. Scheduling the contract work.
- d. Liquidated damages for failure to complete the various portions of the specified times.
- e. Airport safety and security.
- f. Work by Others.

END OF SECTION 00100

SECTION 00130

PRE-BID CONFERENCE

DESCRIPTION

Pre-Qualification of Construction Contractors has been performed on this project in accordance with the Owner's Standard Pre-Qualification Process and Section 00100 Instructions to Bidders.

There will be a mandatory Pre-Bid Conference and site walk held for this project on Tuesday, April 26, 2022 at 1:30 pm, at the Airport Administration Offices on the third floor of the Airport Terminal Building located at One Airport Road, Suite 300, Manchester, NH 03103

END OF SECTION 00130

SECTION 00300

PROPOSAL (BID) DOCUMENTS

DESCRIPTION

**PARKING GARAGE: LEVEL-4 FLOOR & LEVEL-3 CEILING,
SEALANTS, WATERPROOFING, & MISCELLANEOUS
REPAIRS**

MHT / City Bid # FY22-805-50

at

MANCHESTER • BOSTON REGIONAL AIRPORT

City of Manchester, New Hampshire

APRIL 2022

NOTE: The Bidder shall complete and submit the Proposal Documents (Sections 00300 - 00310) in a sealed envelope as per instructions in Subsection 1.08, Section 00100.

PROPOSAL
for
PARKING GARAGE: LEVEL-4 FLOOR & LEVEL-3 CEILING,
SEALANTS, WATERPROOFING, & MISCELLANEOUS REPAIRS
(FY22-805-50)
at
Manchester • Boston Regional Airport

Proposal of _____**hereinafter called "Bidder," a corporation*, organized under the laws of the State of _____, a partnership* or an individual* doing business as _____, to the **City of Manchester, New Hampshire, Department of Aviation** (hereinafter called "Owner").

Gentlemen:

The (Bidder), _____ in compliance with your invitation for bids for the construction of airport improvements having examined the plans and specifications with related documents and the site of the proposed work if required, and being familiar with all of the conditions surrounding the construction of the proposed project including the availability of materials, and labor, hereby proposes to furnish all plant, labor, materials, supplies, equipment, services, and to construct the work in accordance with the Contract Documents, within the time set forth therein, and within the total contract price stated below. This price is to cover all expenses incurred in performing the work required under the Contract Documents, of which this proposal is a part.

Bidder hereby agrees to commence work under this Contract on the date to be specified in a written "Notice to Proceed" of the Owner, and to fully complete the project within the specified contract period.

Bidder further agrees to pay to the Owner, liquidated damages, in the amounts and frequencies as defined in the Contract Documents, for work that remains incomplete beyond the time specified for milestone dates and completion as hereinafter provided in the Contract Documents and subsequent individually executed Work Orders.

Bidder acknowledges receipt of the addenda shown on the attached form entitled **ACKNOWLEDGMENT OF ADDENDA**.

*** strike out inapplicable terms ----- .**

***** The name of the bidder must be exactly the same as the name under which the bidder is listed on the Qualification Statement Documents that were submitted by the Bidder during the Pre-Qualification process for this project.***

Manchester • Boston Regional Airport

PARKING GARAGE: LEVEL-4 FLOOR & LEVEL-3 CEILING, SEALANTS, WATERPROOFING, & MISCELLANEOUS REPAIRS

MHT / City Bid # FY22-805-50

Bid Form

Manchester•Boston Regional Airport

**PARKING GARAGE: LEVEL-4 FLOOR & LEVEL-3 CEILING,
SEALANTS, WATERPROOFING, & MISCELLANEOUS REPAIRS**

MHT / City Bid # FY22-805-50

BID FORM: Base Bid

WORK ITEM	QUANTITY & UNIT	WORK ITEM	FIGURES			
			UNIT PRICE		EXTENSION	
			Dollars	Cents	Dollars	Cents
1.0 General Requirements						
1.1	1	General Requirements - Mobilization and Supplementary General Conditions				
	LS					
2.0 Floor Repairs						
2.1	594	Floor Repair – Full Depth at C.I.P Concrete Wash - Drive Bays				
	SF					
2.2	350	Floor Repair – Partial Depth at C.I.P. Concrete Wash				
	SF					
2.3	20	Floor Repair - Partial Depth at Precast Concrete Floor Slab				
	SF					
2.6	500	Floor Repair – Traffic Topping – Pedestrian Grade				
	SF					
2.7A	700	Floor Repair – Traffic Topping – Full Membrane System				
	SF					
2.7B	24,500	Floor Repair – Traffic Topping – Wearcoat & UV TopCoat				
	SF					
2.7J	1,725	Floor Repair – Nylon Reinforced Traffic Topping (1ft wide) at Jointline Precast Tee-to-Tee Flange				
	SF					
2.7H-T	500	Floor Repair – Traffic Topping – Wearcoat & UV-Topcoat - Helix				
	SF					
2.7H-R	50	Floor Repair – Traffic Topping – Membrane Repairs - Helix				
	SF					
2.8	184,616	Floor Repair - Penetrating Concrete Sealer with Migrating Corrosion Inhibitor (MCI)				
	SF					

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3.0 Ceiling Repairs

3.3	2,000	Ceiling Repair – Epoxy Crack Injection				
	LF					
3.4	900	Ceiling Repair – Overhead Concrete Mortar Repair				
	SF					
3.5	300	Ceiling Repair – GFRP Fabric Wrap				
	SF					
3.6	24,250	Ceiling Repair – Penetrating Corrosion Inhibitor				
	SF					
3.8	650	Ceiling Repair – Galvanic Corrosion Protection				
	EA					
3.9	24,250	Ceiling Repair – Blast Cleaning w/ Abrasive Media				
	SF					

5.0 Floor Slab Joint Repairs

5.2A	10	Floor Slab Joint Repair - Expansion Joint Nosing - Surface Repair				
	LF					
5.3	250	Floor Slab Joint Repair - Remove and Replace Failed T/T Flange Joint Sealants				
	LF					
5.5	297	Floor Slab Joint Repair - Precast Tee Endjoint Replacement – CIP Wash				
	LF					
5.6	150	Floor Slab Joint Repair – Remove and Install Cove Joint Sealant				
	LF					

8.0 Bollards & Traffic Control

8.1	38	Bollards & Traffic Control - Concrete Bollard Removal				
	EA					
8.2	1	Bollards & Traffic Control - Concrete Bollard Disposal				
	LS					
8.3	80	Bollards & Traffic Control - Provide Traffic Delineator Devices (Material)				
	EA					
8.4	80	Bollards & Traffic Control - Install Traffic Delineator Devices				
	EA					

* This row intentionally left blank *

9.0 Field Item Allowances						
9.1	1	Field Item – Pedestrian Bridge Pier-B - Grade Stairs & Ramp Repairs				
	LS					
9.5	\$10,000 Allowance	Field Item Allowance - General	N/A	N/A	10,000	00
<p style="text-align: center;"><u>TOTAL BASE BID</u> (including Field Item Allowance)</p>						

BASE BID SUMMARY

TOTAL BASE BID AMOUNT: _____

_____ Dollars

(Amount in words)

(\$ _____).

(Amount in figures)

The stated prices shall include-all plant, labor, materials, supplies, equipment, services, incidentals, expenses, overhead, profit, insurance, etc., to cover the finished work.

The bidder agrees that the Owner may base low bid on the Base Bid plus any or all of the Add Alternates, if applicable.

The bidder understands that the Owner reserves the right to reject any or all bids and to waive any informalities in the bidding.

The bidder understands that the Owner reserves the right to negotiate with the lowest two bidders.

The bidder agrees that this bid shall be good and may not be withdrawn for a period of 90 calendar days after the actual date of the bid opening.

The bidder agrees that the Owner may reduce the quantities or may delete work items altogether if necessary, to bring the contract awarded within funds available to finance the project. Such reduction or deletion of work shall not constitute a basis for withdrawal of this proposal.

Upon receipt of written notice of acceptance of this bid, bidder will execute and deliver the formal contract attached within 7 calendar days and deliver the Surety Bonds as required by the General Provisions and Section 00100.

The bid security attached in the sum of _____ is to become the property of the Owner in the event the contract and bonds are not executed within the time above set forth, as liquidated damages for the delay and additional expenses to the Owner caused thereby.

Respectfully submitted:

Name of Bidder: _____

By: _____

Name and Title: _____

Business Address: _____

(Affix corporate seal if bid is by a corporation)

CERTIFICATE AS TO CORPORATE PRINCIPAL PROPOSAL

I, _____ certify that I
am the _____ of the corporation
named as Bidder in the above Proposal; that _____ who
signed the said Proposal on behalf of the Bidder was then _____ of said
Corporation; that I know his/her signature and his/her signature thereto is genuine; and that said
Proposal was duly signed, sealed and attested to for and in behalf of said Corporation by authority of
its governing body and is within the scope of its corporate powers.

(Corporate Seal)

ACKNOWLEDGMENT OF ADDENDA

Addendum No. _____ Date: _____

Addendum No. _____ Date: _____

Addendum No. _____ Date: _____

Addendum No. _____ Date: _____

Addendum No. _____ Date: _____

Addendum No. _____ Date: _____

Addendum No. _____ Date: _____

Addendum No. _____ Date: _____

Addendum No. _____ Date: _____

END OF SECTION 00300

SECTION 00310

BID BOND

KNOW ALL MEN BY THESE PRESENTS, THAT WE, THE UNDERSIGNED,

(Name of Principal)

as PRINCIPAL, and

(Name of Surety)

as SURETY, are held and are firmly bound unto **The City of Manchester, New Hampshire, Department of Aviation** hereinafter called the Owner, in the penal sum of

lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the Principal has submitted

the accompanying Bid, _____ for _____

(Enter Title and Number of Contract/Project)

NOW, THEREFORE, if the Principal shall not withdraw said bid within 90 calendar days after the opening thereof, and shall within seven (7) calendar days after the prescribed forms are presented to him/her for signature, enter into a written Contract with the Owner in accordance with the bid as accepted, and give bonds with good and sufficient Surety or sureties, as may be required, for the faithful performance and proper fulfillment of such Contract; or in the event of the withdrawal of said bid within the period specified, or the failure to enter into such Contract and give such bonds within the time specified, if the Principal shall pay the Owner the difference between the amount specified in said bid and the amount for which the Owner may procure the required work or supplies or both, if the latter amount be in excess of the former, then the above obligation shall be void and of no effect, otherwise to remain in full force and virtue.

IN WITNESS WHEREOF, the above named Principal and Surety have executed this instrument under their several seals this _____ day of _____, name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

In presence of:

Individual Principal SEAL

Business Address

Individual Principal SEAL

Business Address

Attest:

Corporate Principal

Business Address

**Affix
Corporate
Seal**

Attest:

By: _____

Corporate Surety

Business Address

**Affix
Corporate
Seal**

By: _____

Attorney-in-Fact

****Power-of-attorney for person(s) signing for surety company must be attached to this bond.***

CERTIFICATE AS TO CORPORATE PRINCIPAL BID BOND

I, _____,
certify that I am the _____ of _____ the
Corporation named as principal in the within bond; that _____
_____, who signed the said bond on behalf of the Principal was then _____
_____ of said Corporation; that I know his/her signature, and his/her signature thereto is
genuine, and that said bond was duly signed, sealed, and attested to for and in behalf of said
Corporation by authority of its governing body.

**Affix
Corporate
Seal**

By:

END OF SECTION 00310

SECTION 00500

AGREEMENT DOCUMENTS

DESCRIPTION

**MANCHESTER • BOSTON REGIONAL AIRPORT
PARKING GARAGE LEVEL-4 FLOOR & LEVEL-3 CEILING,
SEALANTS, WATERPROOFING, & MISCELLANEOUS REPAIRS
(FY22-805-50)**

This AGREEMENT, made this, by and between the City of Manchester, New Hampshire,
Department of Aviation herein called "Owner", and _

_____ a corporation* organized under the laws of the State
of _____, a partnership* or an individual* doing business
as _____ hereinafter called "Contractor".

(* strike out inapplicable terms)

WITNESSETH, that the Contractor and the Owner for the consideration stated herein mutually
agree as follows:

ARTICLE 1. STATEMENT OF WORK

The Contractor shall furnish all means and methods to perform and complete all work, including but
not necessarily limited to plant, labor, material, equipment, supplies and services including all extra
work directed, as required in strict accordance with all requirements stated or shown in the Contract
Documents including addenda to said Contract Documents which addenda are numbered and dated
as follows:

Addendum No.	Dated

The Owner shall pay the Contractor for this satisfactory performance of the Contract, in current funds, subject to additions and deductions as provided in the Contract Documents, the sum of

TOTAL CONTRACT AMOUNT: _____

_____ dollars
(Amount in words)

(\$ _____).
(Amount in figures)

ARTICLE 3. CONTRACT DOCUMENTS

The executed Contract Documents shall consist of the following component parts:

- a. This agreement
- b. Addenda as listed in Article 1
- c. Signed Copy of Proposal
- d. Required Certifications of Compliance
- e. Bid Forms and Contract Requirements
- f. Technical Specifications
- g. Drawings (as listed in the Schedule of Drawings)
- h. Performance and Payment Bonds

This instrument, together with the other documents enumerated in this Article 3, which said other documents are as fully a part of the Contract as if hereto attached or herein repeated, from the Contract. The various conditions in Addenda shall be construed in the order of preference of the component part of the Contract which each modified.

ARTICLE 4. SITE AVAILABILITY AND TIME FOR COMPLETION

The Contractor hereby acknowledges the following scheduled availability dates:

The Contractor agrees to complete the on-site work under this contract in 130 calendar days or less from the date of Notice To Proceed. The maximum duration (130 calendar day) construction period shall fall within the time frame dates specified below.

On-site work shall commence on or before May 23, 2022 and be complete on or before September 30, 2022, unless otherwise extended by the Owner to accomplish additional work.

ARTICLE 5. CERTIFICATES OF INSURANCE

The Contractor shall furnish Certificates of Insurance as described in Section 00822, INSURANCE REQUIREMENTS, and shall list the policies as follows:

Limits of Policy	Expiration			
Type of Insurance	Coverage	Number	Insurance Co.	Date
Workman's Compensation				
General Liability				
Automobile Liability				
Builder's Risk				

These Insurance Certificates as well as Performance and Payment Bonds must be furnished at or before the time of the execution of this document, or the Contract shall not be valid until all in-process outstanding bonding requirements are executed and received by the Owner. Insurance certificate shall be re-issued annually thereafter. Such certificates shall, with respect to comprehensive general liability and auto liability insurance, name the City of Manchester, Department of Aviation, and City of Manchester, Department of Risk Management, and AECOM Technical Services, Inc. as an additional insured (except worker's compensation).

IN WITNESS WHEREOF, the parties to these presents have executed this Contract in seven (7) counterparts each of which shall be deemed an original, as of the year and day first above mentioned.

(Corp. Seal)
ATTEST:

_____	By: _____
<i>Witness</i>	Contractor Date
_____	By: _____
<i>Witness</i>	Dept. Of Aviation Date

END OF SECTION 00500

SECTION 00510

PERFORMANCE BOND

DESCRIPTION

FORM OF PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS

That we, _____, an individual*, a partnership*, a corporation organized under the laws of the State of _____* having a usual place of business in the State of _____ as Principal, and _____

_____ a corporation organized under the laws of the State of _____ and having a usual place of business in the State of _____ as Surety, are holden and stand firmly bound and obligated unto the City of Manchester, New Hampshire, Department of Aviation (hereinafter the Owner), its successors and assigns, in the sum of _____ Dollars (\$ _____) lawful money of the United States of America, to and for the true payment whereof, we bind ourselves and each of us, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents. WHEREAS, the said Principal has by means of a written agreement dated _____, 20____, entered into a Contract with the Owner for:

The Manchester • Boston Regional Airport Parking Garage: Level-4 Floor & Level-3 Ceiling, Sealants, Waterproofing, & Miscellaneous Repairs FY22-805-5

_____ a copy of which Contract is attached hereto and by reference made a part hereon.

***Strike out inapplicable terms.**

NOW, THEREFORE, THE CONDITION of this obligation is such that if the said Principal and his/her subcontractors shall well and truly keep and perform all the agreements, terms and conditions in said Contract set forth and specified to be by said Principal kept and performed, and shall well and truly indemnify and save harmless the Owner against all counsel fees paid or incurred by the Owner as a result of a breach of any condition of this bond, and against all claims and suits for damage to person or property arising from carelessness or want of due care, or any act or omission on the part of said Principal during the performance of said Contract, then this obligation shall be void; otherwise, it shall remain in full force and virtue.

PROVIDED, FURTHER, that said Surety, for value received, hereby stipulates and agrees that no extension of time, or change in, alteration or addition to the terms of the Contract or to the work to be performed there under or the Contract Documents accompanying the same and no failure or refusal of the Owner to withhold any monies from the Principal shall in any way affect its obligations on this bond, and it does hereby waive notice of any such extension of time, change, alterations or addition to the terms of the Contract or the work or to the Contract Documents.

In the event that the Contract is abandoned by the Principal, or is terminated by the Owner under the provisions of said Contract, said Surety hereby further agrees that said Surety shall, if requested in writing by the Owner, take action as is necessary to complete said Contract.

This bond shall become effective at the same time as the Contract annexed hereto for the work hereinbefore mentioned.

IN WITNESS WHEREOF, we have set our hands and seals to this bond, this _____ day of _____, 20____ In presence of:

Witness

Individual Principal SEAL

Business Address

Individual Principal SEAL

Business Address

Attest:

Corporate Principal SEAL

By: _____

Attest:

Corporate Surety SEAL

Business Address

By: _____

Countersigned:

By: _____

**CERTIFICATE AS TO CORPORATE
PRINCIPAL PERFORMANCE BOND**

I, _____, certify that I am the _____
_____ of the Corporation named as Principal in the within
bond; that, _____ who
signed the said bond on behalf of the principal was then _____, of said
Corporation; that I know his/her signature and his/her signature thereto is genuine; and that said
bond was duly signed, sealed and attested to for and in behalf of said Corporation by authority of
its governing body and is within the scope of its corporate powers.

_____ SEAL

(Power of attorney of person(s) signing Bond for Surety Company must be attached.)

NOTE: Date of Bond must not be prior to date of Contract. If Principal is Partnership, all partners must execute bond.

END OF SECTION 00510

SECTION 00520

PAYMENT BONDS

FORM OF PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS

That we, _____, an
individual *, a partnership*, a corporation organized under the laws of the State of _____
_____ * having a usual place of business in the State of _____, as
Principal, and _____, a
corporation organized under the laws of the State of _____, and
having a usual place of business in the State of _____, as
Surety, are holden and stand firmly bound and obligated unto the City of Manchester, New
Hampshire, Department of Aviation (hereinafter the Owner), its successors and assigns, in the sum
of _____
_____ Dollars (\$ _____), lawful money of the United States of America,
to and for the true payment whereof, we bind ourselves and each of us, our heirs, executors,
administrators, successors, and assigns, jointly and severally, firmly by these presents.

WHEREAS, the said Principal has by means of a written agreement dated _____
_____, 20_____ entered into a Contract with the Owner for: _____

**The Manchester • Boston Regional Airport Parking Garage: Level-4 Floor & Level-3
Ceiling, Sealants, Waterproofing, & Miscellaneous Repairs, Project No. FY22-805-50**

a copy of which Contract is attached hereto and by reference made a part hereof.

*** Strike out inapplicable terms**

PROVIDED, FURTHER, that said Surety, for value received, hereby stipulates and agrees (1) that no extension of time, or change in, alteration or addition to the terms of the Contract or to the work to be performed thereunder or the Contract Documents accompanying the same and no failure or refusal of the Owner to withhold any monies from the Principal shall in any way affect its obligations on this bond, and it does hereby waive notice of any such extension of time, change, alterations, or addition to the terms of the Contract or the work or to the Contract Documents; (2) that in case of liabilities not covered by said Section 16 of Chapter 447 RSA, as amended, but covered by this bond, then the provisions of this bond shall control.

In addition to the obligations of the undersigned enumerated above, the bond is also made for the use and benefit of all persons, firms and corporations, who may furnish any material or perform any labor on account of said Contract, or rent or hire out any appliances or equipment used or employed in the execution of said Contract and they and each of them are hereby made Obligees hereunder the same as if their own proper respective names were written herein as such, and they and each of them may proceed or sue hereon, and in case of failure of said Principal to carry out the foregoing provisions made for the use and benefit of any said persons, firms and corporations, the Owner as an additional remedy may maintain an action against the undersigned in its own name, but in trust for and for the benefit of said persons, firms and corporations

This bond shall become effective at the same time as the Contract annexed hereto for the work hereinbefore mentioned.

_____, 20____ In presence of:

Attest:

By: _____

Attest:

Business Address

By: _____

By: _____

**CERTIFICATE AS TO CORPORATE
PRINCIPAL PAYMENT BOND**

I, _____, certify that I
am the _____ of the Corporation
named as Principal in the within bond; that, _____ who
signed the said bond on behalf of the principal was then _____, of
said Corporation; that I know his/her signature and his/her signature thereto is genuine; and that
said bond was duly signed, sealed and attested to for and in behalf of said Corporation by authority
of its governing body and is within the scope of its corporate powers.

SEAL

By: _____

(Power of attorney of person(s) signing Bond for Surety Company must be attached.)

NOTE: Date of Bond must not be prior to date of Contract. If Principal is Partnership, all
partners must execute bond.

END OF SECTION 00520

SECTION 00710

DEFINITION OF TERMS

DESCRIPTION

Whenever the following terms are used in these specifications, in the contract, in any documents or other instruments pertaining to construction where these specifications govern, the intent and meaning shall be interpreted as follows:

AASHTO. The American Association of State Highway and Transportation Officials, the successor association to AASHTO.

ACCEPTANCE. "Acceptance" is when the Owner determines all of the contract requirements have been completed (based on the closeout procedures set forth herein). A copy of Owner acceptance will be sent to the Contractor. Upon receipt of the acceptance, the Contractor will be relieved of the duty of maintaining and protecting the work. After acceptance of the work, the Owner will initiate final settlement and payment in accordance with state statutes.

ACCESS ROAD. The right-of-way, the roadway and all improvements constructed thereon connecting the airport to a public highway.

ACT OF GOD. "Act of God" means an earthquake of magnitude 4.5 or greater on the Richter scale, flood, tornado, or other cataclysmic phenomenon of nature or rain, snowstorm, windstorm, high water, or other natural phenomenon in excess of the norm as established by NOAA weather data.

ADDENDUM. A document issued by the Owner during the bidding period, which modifies, supersedes, or supplements the original contract documents.

ADVERTISEMENT. A public announcement, as required by local law, inviting bids for work to be performed and materials to be furnished.

AIP. The Airport Improvement Program, a grant-in-aid program, administered by the Federal Aviation Administration.

AIR OPERATIONS AREA. For the purpose of these specifications, the term air operations area shall mean any area of the airport used or intended to be used for the landing, takeoff, or surface maneuvering of aircraft. An air operation area shall include such paved or unpaved areas that are used or intended to be used for the unobstructed movement of aircraft in addition to its associated runway, taxiway, or apron.

AIRPORT. Airport means an area of land or water, which is used or intended to be used for the landing and takeoff of aircraft, and includes its buildings and facilities, if any.

ARCHITECT/ENGINEER. The Architect/Engineer shall mean the Owner's duly authorized representative to the Contractor with respect to this project during construction and until the final completion of the Project.

ASTM. The American Society for Testing and Materials.

AUTHORITY. The term, where used herein, shall mean the Manchester•Boston Regional Airport (MHT).

AWARD. The acceptance, by the Owner, of the successful bidder's proposal.

AWARDING AUTHORITY OR AGENT OF CITY. The person or group authorized by the Owner to award the Contract.

BENEFICIAL OCCUPANCY. The right of the Owner to occupy all or any portion of the project prior to final completion of the work. Such occupancy does not constitute acceptance or substantial completion by the Owner of the work or any portion thereof, nor will it relieve the Contractor of the responsibility for correcting the defective work or materials at any time before acceptance of the work.

BID. The offer of the bidder to perform the work when made out and submitted on the prescribed bid form, properly executed and guaranteed (see PROPOSAL).

BID FORM. The approved form upon which the Owner requires a formal bid be prepared and submitted for the work (see PROPOSAL).

BIDDER. Any individual, partnership, firm, or corporation, acting directly or through a duly authorized representative, who submits a proposal for the work contemplated.

BUILDING AREA. An area on the airport to be used, considered, or intended to be used for airport buildings or other airport facilities or rights-of-way together with all airport buildings and facilities located thereon.

CALENDAR DAY. Every day shown on the calendar.

CHANGE ORDER. A written order to the Contractor covering changes in the plans, specifications, or proposal quantities and establishing the basis of payment and contract time adjustment, if any, for the work affected by such changes. This order may contain one or several Cost Proposals.

CONSTRUCTION CHANGE DIRECTIVE. The form and procedure established when the Owner and the Contractor are not in total agreement on the terms of a Cost Proposal Request. The Owner's Representative may issue a Construction Change Directive instructing the Contractor to proceed with the change in the Work, for subsequent inclusion in a Change Order.

CONTRACT. The written agreement covering the work to be performed.

CONTRACT BOND. The approved form of security furnished by the Contractor and his/her Surety as a guarantee of good faith and ability on the part of the Contractor to execute the work in accordance with the terms of the plans, specifications, and contract; this may include either or both a payment bond and a performance bond.

CONTRACT DOCUMENTS. All documents listed in the Contract Agreement as being component parts of the Contract Documents. Also, all applicable Federal and State laws, Municipal ordinances, and Rules and regulations of all authorities having jurisdiction over construction of the Project shall be deemed to be included in the Contract Documents the same as therein written out in full.

CONTRACT DRAWINGS. "Contract drawings" or "drawings" means and includes (a) all drawings which have been prepared on behalf of the Owner and are included in the Contract Documents and all modifying drawings issued by addenda thereto; (b) all drawings submitted pursuant to the terms of the Contract by the Contractor with his/her proposal to the Owner during the progress of the work which are accepted by the Owner; and (c) all drawings submitted by the Owner to the Contractor during the progress of the work.

CONTRACT ITEM (PAY ITEM). A specific unit of work for which a price is provided in the contract.

CONTRACT TIME. The number of calendar days or working days, stated in the proposal, allowed for completion of the contract, including authorized time extensions. If a calendar date of completion is stated in the proposal, in lieu of a number of calendar or working days, the contract shall be completed by that date.

CONTRACTOR. The individual, partnership, firm, or corporation primarily liable for the acceptable performance of the work contracted and for the payment of all legal debts pertaining to the work who acts directly or through lawful agents or employees to complete the contract work.

COST PROPOSAL. The form and procedure established to identify and communicate the cost related to changes in the Work for consideration and approval prior to inclusion in a Change Order.

CRITICAL PATH METHOD (CPM). "Critical path method" is a schedule technique.

DAY. "Day" or "working day" means calendar day and shall include every day including Saturdays, Sundays, and legal holidays.

DIRECTED. "Directed," "designated," "permitted," "required," "accepted," and words of like import, wherever and in whatever manner used, with or without reference to the Owner, means as directed, designated, permitted, required, and accepted by the Owner.

DRAINAGE SYSTEM. The system of pipes, ditches, and structures by which surface or subsurface waters are collected and conducted from the airport area.

EQUIPMENT. All machinery, together with the necessary supplies for upkeep and maintenance, and also all tools and apparatus necessary for the proper construction and acceptable completion of the work.

EXTRA WORK. An item of work not provided for in the awarded contract as previously modified by change order or supplemental agreement, but which is found by the Owner's Representative to be necessary to complete the work within the intended scope of the contract as previously modified.

FAA. The Federal Aviation Administration of the U.S. Department of Transportation. When used to designate a person, FAA shall mean the Administrator or his/her duly authorized representative.

FEDERAL SPECIFICATIONS. The Federal Specifications and Standards, and supplements, amendments, and indices thereto prepared and issued by the General Services Administration of the Federal Government.

FIELD INSTRUCTION. Is an instruction given during the course of the work.

FINAL COMPLETION. "Final completion" is that point in the contract as determined by the Owner through a final inspection that the Contractor has completed all physical work and is ready to prepare for final closeout and acceptance as prescribed herein. All work is complete, accessible, operable, and usable by the Owner, all parts, systems and site work are 100% complete and cleaned for the Owner's use. The Owner will issue a certificate of final completion.

GENERAL NOTES. The written instructions, provisions, conditions, or other requirements appearing on the drawings, and so identified thereon, which pertain to the performance of the work.

HEREIN. "Herein," "hereinafter," and words of similar import shall refer to the contract documents.

INFORMATION NOTICE. The form and procedure established to transmit information to the Contractor from the Owner to clarify or interpret the contract documents and to notify the Contractor of changes in the work.

INSPECTOR / RESIDENT ENGINEER. An authorized representative of the Owner assigned to make all necessary inspections and/or tests of the work performed or being performed, or of the materials furnished or being furnished by the Contractor.

INSTALL. "Install," wherever and in whatever manner used, shall mean the installation complete in place of any item or equipment or material.

INTENTION OF TERMS. Whenever, in these specifications or on the plans, the words "directed", "required", "permitted", "ordered", "designated", "prescribed", or words of the like import are used, it shall be understood that the direction, requirement, permission, order, designation, or prescription of the Owner is intended; and similarly, the words "approved", "acceptable", "satisfactory", or words of like import, shall mean approved by, or acceptable to, or satisfactory to the Owner's Representative, subject in each case to the final determination of the Owner.

Any reference to a specific requirement of a numbered paragraph of the contract specifications or a cited standard shall be interpreted to include all general requirements of the entire section, specification item, or cited standard that may be pertinent to such specific reference.

LABORATORY. The official testing laboratories of the Owner or such other laboratories as may be designated by the Program Manager.

LESSEE. A person, company or corporation leasing space at the Airport from the Manchester Airport Authority, City of Manchester Department of Aviation.

LIGHTING. A system of fixtures providing or controlling the light sources used on or near the airport or within the airport buildings. The field lighting includes all luminous signals, markers, floodlights, and illuminating devices used on or near the airport or to aid in the operation of aircraft landing at, taking off from, or taxiing on the airport surface.

LIQUIDATED DAMAGES. The amount prescribed in the Contract to be paid to the Owner or to be deducted from any payments due or to become due the Contractor for each day's delay in completing the whole or any specified portion of the work beyond the time allowed in the Contract plus approved time extensions.

MAJOR AND MINOR CONTRACT ITEMS. A major contract item shall be any item that is listed in the proposal, the total cost of which is equal to or greater than 20 percent of the total amount of the award contract. All other items shall be considered minor contract items.

MATERIALS. Any substance specified for use in the construction of the contract work.

MAY. "May," wherever and in whatever manner used, is permissive.

NETWORK. The graphic representation of the construction Project Schedule prepared using the Critical Path Method. The Network shows the sequence and interdependence of activities, and planned and actual progress by activity, required for complete performance of the Work.

NOTAM. Notice to Airmen.

NOTICE OF AWARD. A written notice to the successful bidder stating that his/her bid has been accepted and that, in accordance with the terms of the notice and the specifications, he is required to execute the contract and furnish satisfactory contract bond.

NOTICE TO PROCEED. A written notice to the Contractor to begin the actual contract work on a previously agreed to date. If applicable, the Notice to Proceed shall state the date on which the contract time begins.

OTHERS. Other Contractors, this Contractor under another contract agreement, organizations not connected with this Contractor which are performing functions in relation to this project, or personnel retained by the Owner.

OWNER. City of Manchester, or the Owner's Representative with respect to this project and its administration (see Program Manager).

OWNER'S REPRESENTATIVE. Whosoever the Owner may designate as his/her representative.

PAVEMENT. The combined surface course, base course, and subbase course, if any, considered as a single unit.

PAYMENT BOND. The approved form of security furnished by the Contractor and his/her Surety as a guaranty that he will pay in full all bills and accounts for materials and labor used in the construction of the work.

PERFORMANCE BOND. The approved form of security furnished by the Contractor and his/her Surety as a guaranty that the Contractor will complete the work in accordance with the terms of the contract.

PLANS. The official drawings or exact reproductions which show the location, character, dimensions and details of the airport and the work to be done and which are to be considered as a part of the contract, supplementary to the specifications.

PROGRAM MANAGER. Owner representative as used under this contract, shall be assigned by the Owner. The Program Manager or Owner's Representative will be the Owner's duly authorized representative to the Contractor with respect to this project during construction and until the final completion.

PROJECT. The agreed scope of work for accomplishing specific airport development with respect to a particular airport.

PROPOSAL. The written offer of the bidder (when submitted on the approved proposal form) to perform the contemplated work and furnish the necessary materials in accordance with the provisions of the Contract Documents.

PROPOSAL GUARANTEE. The security furnished with a proposal to guarantee that the bidder will enter into a contract if his/her proposal is accepted by the Owner.

PROVIDE. "Provide," wherever and in whatever manner used, shall be understood to mean provide complete in place, that is, furnish and install.

REQUEST FOR CHANGE. Shall mean any detailed request for a contract change or equitable adjustment.

REQUEST FOR INFORMATION. The form and procedure established, for requesting information, between the Contractor and Owner to clarify or interpret the contract documents or discover conflicts, omissions, or errors in these documents. In addition, the Request for Information may be a precursor to Cost Proposals and Change Orders.

RIGHT-OF-WAY. All lands or other property interests provided or acquired for the development and operation of an airport and its appurtenances.

RUNWAY. The area on the airport prepared for the landing and takeoff of aircraft.

SHALL OR WILL. "Shall" or "will," whenever used to stipulate anything is mandatory, means shall or will be done or be performed by either the Contractor or the Owner and means that the Contractor or the Owner has thereby entered into a covenant with the other party to do or perform the same.

SHOWN. "Shown," "indicated," "detailed," and words of like import, wherever and in whatever manner used, with or without reference to the drawings, means shown, indicated, or detailed on the drawings (or other documents).

SITE. An area or areas on the Airport provided to the Contractor in which to work, store materials and/or equipment, and perform other activities associated with performing the Work.

SPECIALIST. The term "Specialist" as used in the contract specification shall mean an individual or firm of established reputation (or, if newly organized, whose personnel have previously established a reputation in the same field), which is regularly engaged in, and which maintains a regular work force of workmen skilled in either (as applicable) manufacturing or fabricating items required by the contract, installing items required by the contract, or otherwise performing work required by the contract. Where the contract specifications require installation by a specialist, that term shall also be deemed to mean either the manufacturer of the item, an individual or firm licensed by the manufacturer, or an individual or firm who will perform the work under the manufacturer's direct supervision.

SPECIFICATIONS. A part of the contract documents containing the written directions and requirements for completing the contract work. Standards for specifying materials or testing which are cited in the contract specifications by reference shall have the same force and effect as if included in the contract physically.

SPECIFIED. "Specified," "described," or "noted," wherever and in whatever manner used, means as specified, described, shown or noted in the contract documents.

SPONSOR (OWNER). For AIP contracts, the term sponsor shall have the same meaning as the term OWNER.

STRUCTURES. Airport facilities such as bridges, culverts, catch basins, inlets, retaining walls, cribbing; storm and sanitary sewer lines; water lines; underdrains; electrical ducts, manholes, handholes, lighting fixtures and bases; transformers; flexible and rigid pavements; navigational aids; buildings; vaults; and, other manmade features of the airport that may be encountered in the work and not otherwise classified herein.

SUBCONTRACTOR. A person, firm or corporation supplying labor and materials or only labor for work at the site of the project for, approved by the owner, and under separate contract or agreement with, the Contractor.

SUBGRADE. The soil which forms the foundation.

SUBMITTALS. The term "submittals" shall include shop drawings, calculations, samples, schedules, procedures, manufacturer's brochures, pamphlets, catalog cuts, color charts, or other descriptive data, clearly defining the article, material, equipment, or device proposed for use in the work. The shop drawings are the drawings and diagrams showing details of fabrication and erection which the Contractor is required to submit to the Owner's authorized representative.

SUBMITTED. "Submitted," wherever and in whatever manner used, means submitted to the Owner for review or acceptance.

SUBSTANTIAL COMPLETION. "Substantial completion" is when the Owner determines the contract work can be used for its intended purpose as prescribed by the closeout procedures contained herein. The Contractor will be so notified when the work is substantially complete and it is the point at which guarantees or warranties begin. Substantial completion does not constitute acceptance or final completion of the work. Remaining omissions and defects must be completed prior to final completion and acceptance.

SUFFICIENT. "Sufficient," "necessary," "proper," "acceptable," "satisfactory," "desirable," and words of like import wherever and in whatever manner used, with or without reference to the Owner, means sufficient, necessary, proper, acceptable, satisfactory, and desirable in the judgment of the Owner.

SUPERINTENDENT. The Contractor's executive representative who is present on the work site during progress, authorized to receive and fulfill instructions from the Program Manager, and who shall supervise and direct the construction.

SUPPLEMENTAL AGREEMENT. A written agreement between the Contractor and the Owner which amends or supplements the original agreement. (1) work that would increase or decrease the total amount of the awarded contract, or any major contract item, by more than 25 percent, such increased or decreased work being within the scope of the originally awarded contract; or (2) work that is not within the scope of the originally awarded contract.

SUPPLIER. "Supplier" shall mean an individual, partnership, firm, or corporation, or legally constituted Joint Venture entering into an agreement with the Owner, Contractor or subcontractor for furnishing materials or equipment to be incorporated in the work by the Owner, Contractor or Subcontractor.

SURETY. The corporation, partnership, or individual, other than the Contractor, executing payment or performance bonds which are furnished to the Owner by the Contractor.

TAXIWAY. For the purpose of this document, the term taxiway means the portion of the air operations area of an airport that has been designated by competent airport authority for movement of aircraft to and from the airport's runways or aircraft parking areas.

WORK. The furnishing of all plant labor, materials, tools, equipment, supplies, services, and incidentals necessary or convenient to the Contractor's performance of all duties and obligations imposed by the contract documents, plans, and specifications.

WORKING DAY. Any calendar day.

END OF SECTION 00710

SECTION 00720

CONDITIONS RELATING TO THE SCOPE OF WORK

DESCRIPTION

1. INTENT OF CONTRACT

The intent of the contract documents is to provide for construction and completion, in every detail, of the work described. It is further intended that the Contractor shall furnish all plant, labor, materials, equipment, tools, transportation, services, and supplies required to complete the work in accordance with the contract documents,

2. ALTERATION OF WORK AND QUANTITIES

The Owner reserves and shall have the right to make such alterations in the work as may be necessary or desirable to complete the work originally intended in an acceptable manner. Unless otherwise specified herein, the Owner's Representative shall be and is hereby authorized to make such alterations in the work as may increase or decrease the originally awarded contract quantities which shall not invalidate the contract nor release the Surety, and the Contractor agrees to accept payment for such alterations as if the altered work had been a part of the original contract. "Change Orders" issued by the Owner's Representative shall cover alterations, which are for work not within the general scope of the contract. Change orders for altered work shall include extensions of contract time where, in the Owner's Representative's opinion, such extensions are commensurate with the added work.

If the alterations or changes in quantities significantly change the character of the work under the contract, whether or not changed by any such different quantities or alterations, an adjustment, excluding loss of anticipated profits, will be made to the contract. The basis for the adjustment shall be agreed upon prior to the performance of the work. If a basis cannot be agreed upon, then an adjustment will be made either for or against the Contractor in such amount as the Engineer may determine to be fair and equitable. The term "significant change" shall be construed to apply only to the following circumstances:

- a. When the character of the work as altered differs materially in kind or nature from that involved or included in the original proposed construction

3. OMITTED WORK

The Owner's Representative may, in the Owner's best interest, omit any work. Work may be omitted by a supplemental agreement and shall not invalidate any other contract provision or requirement. Should any contract work be omitted or otherwise ordered to be non-performed, the Contractor shall be paid for all work performed toward completion of such item prior to the date of

the order to omit such item. Payment for work performed shall be in accordance with the Section 01270, "Unit Prices."

4. EXTRA WORK

Should acceptable completion of the contract require the Contractor to perform an item of work for which no basis of payment has been provided in the original contract or previously issued change orders or supplemental agreements, the same shall be called Extra Work. Extra work that is within the general scope of the contract shall be covered by written change order. Change orders for such extra work shall contain agreed prices for performing the change order work in accordance with the requirements specified in the order, and shall contain any adjustment to the contract time that, in the Program Manager's opinion, is necessary for completion of such extra work.

Extra work that is necessary for acceptable completion of the project, but is not within the general scope of the work covered by the original contract shall be covered by a Supplemental Agreement as hereinbefore defined in Section 00710, DEFINITIONS.

Any claim for payment of extra work that is not covered by written agreement (change order or supplemental agreement) shall be rejected by the Owner.

5. MAINTENANCE OF TRAFFIC

It is the explicit intention of the contract that the safety of aircraft, as well as the Contractor's equipment and personnel, is the most important consideration. It is understood and agreed that the Contractor shall provide for the free and unobstructed movement of pedestrians/vehicles in traffic areas of the airport with respect to his/her own operations and the operations of all his/her subcontractors as specified in the subsection titled LIMITATION OF OPERATIONS of Section 00760. It is further understood and agreed that the Contractor shall provide for the uninterrupted operation of visual and electronic signals (including power supplies thereto) used in the guidance of pedestrians and *vehicles* while operating to, from, and upon the airport as specified in the subsection titled CONTRACTOR'S RESPONSIBILITY FOR UTILITY SERVICE AND FACILITIES OF OTHERS in Section 00750.

With respect to his/her own operations and the operations of all his/her subcontractors, the Contractor shall provide marking, lighting, and other acceptable means of identifying: personnel; equipment; vehicles; storage areas; and any work area or condition that may be hazardous to the operation of aircraft, traffic, fire-rescue equipment, or maintenance vehicles at the airport.

The contract requires the maintenance of vehicular traffic on an existing road, street, or highway and parking lots during the Contractor's performance of work that is otherwise provided for in the contract, plans, and specifications, the Contractor shall keep such road, street, or highway open to all traffic and shall provide such maintenance as may be required to accommodate traffic. The Contractor shall furnish, erect, and maintain barricades, warning signs, flagmen, guards, and other traffic control devices in reasonable conformity with the Manual of Uniform Traffic Control Devices for Streets and Highways (published by the United States Government Printing Office),

unless otherwise specified herein. The Contractor shall also construct and maintain in a safe condition any temporary connections necessary for ingress to and egress from abutting property or intersecting roads, streets or highways. Unless otherwise specified herein, the Contractor will not be required to furnish snow removal for such existing road, street, or highway.

The Contractor shall make his/her own estimate of all labor, materials, equipment, and incidentals necessary for providing the maintenance of aircraft and vehicular traffic as specified in this subsection.

The Owner can assess a monetary fine of up to \$2,500 per day for the non-conformance of any aspect of this section.

The cost of maintaining the pedestrian and vehicular traffic specified in this subsection shall not be measured or paid for directly, but shall be included in the contract amount.

6. REMOVAL OF EXISTING STRUCTURES

Should the Contractor encounter an existing structure (above or below ground) in the work for which the disposition is not indicated on the plans, the Owner's Representative shall be notified prior to disturbing such structure. The disposition of existing structures so encountered shall be immediately determined by the Owner's Representative in accordance with the provisions of the contract.

Except as provided in the subsection titled RIGHTS IN AND USE OF MATERIALS FOUND IN THE WORK of this section, it is intended that all existing materials or structures that may be encountered (within the lines, grades, or grading sections established for completion of the work) shall be utilized in the work as otherwise provided for in the contract and shall remain the property of the Owner when so utilized in the work.

7. RIGHTS IN AND USE OF MATERIALS FOUND IN THE WORK

Should the Contractor encounter any material such as (but not restricted to) sand, stone, gravel, slag, or concrete slabs within the established lines, grades, or grading sections, the use of which is intended by the terms of the contract to be either embankment or waste, he may at his/her option either:

- a. Use such material in another contract item, providing such use is approved by the Owner's Representative and is in conformance with the contract specifications applicable to such use; or,
- b. Remove such material from the site, upon written approval of the Owner's Representative; or
- c. Use such material for his/her own temporary construction on site; or,
- d. Use such material as intended by the terms of the contract.

It is understood and agreed that the Contractor shall make no claim for delays by reason of his/her exercise of option a., b., c., or d.

The Contractor shall not excavate, remove, or otherwise disturb any material, structure, or part of a structure which is located outside the lines, grades, or grading sections established for the work, except where such excavation or removal is provided for in the contract, plans, or specifications.

8. PROTECTION OF WORK AND PROPERTY

The Contractor shall at all times safely guard the Owner's property from injury or loss in connection with this contract. He shall at all times safely guard and protect his own work, and that of adjacent property from damage. The Contractor shall replace or make good any such damage, loss or injury unless such be caused directly by errors contained in the Contract or by the Owner, or the Owner's duly authorized representatives.

In case of an emergency which threatens loss or injury of property, and/or safety of life, the Contractor will be allowed to act, without previous instructions from the Owner, in a diligent manner. He shall notify the Owner immediately thereafter. Any claim for compensation by the Contractor due to such extra work shall be promptly submitted to the Owner for approval.

Where the Contractor has not taken action but has notified the Owner of an emergency threatening injury to persons or damage to the work or any adjoining property, he shall act as instructed or authorized by the Owner.

The amount of reimbursement claimed by the Contractor on account of any emergency action shall be determined in the manner provided in subsection entitled EXTRA WORK of this section.

9. FINAL CLEANING UP

Upon completion of the work (in each Phase, if Multi-Phased) and before acceptance and final payment will be made, the Contractor shall remove from the site all machinery, equipment, surplus and discarded materials, rubbish, temporary structures, and stumps or portions of trees. He shall cut all brush and woods within the limits indicated and shall leave the site in a neat and presentable condition. Material cleared from the site and deposited on adjacent property will not be considered as having been disposed of satisfactorily, unless the Contractor has obtained the written permission of such property owner. Additional clean-up requirements are shown in Division 1 of the Contract Documents.

END OF SECTION 00720

SECTION 00730

CONDITIONS RELATING TO CONTROL OF WORK

DESCRIPTION

1. AUTHORITIES AND LIMITATIONS

- a. The City of Manchester alone shall have the power to exercise the rights, responsibilities, authorities, and functions vested therein by the contract documents, except that it shall have the right to designate authorized representatives to act for them. Wherever any provision in this contract specifies an individual (such as, but not limited to, Program Manager, Resident Engineer, Inspector, Custodian or other agent or other representative) or organization, whether governmental or private, to perform any act on behalf of or in the interests of the Owner, that individual or organization shall be deemed to be the City of Manchester authorized representative under this contract but only to the extent so specified. The Owner may, at any time during the performance of this contract, vest in any such authorized representatives additional power and authority to act for him/her or designate additional representatives, specifying the extent of their authority to act for him/her; a copy of each document vesting additional authority in an authorized representative or designating an additional authorized representative shall be furnished to the Contractor.
- b. The Owner shall provide an Operations Coordinator who shall have the authority to open and close facilities and to coordinate with airport users. At the completion of work each day and prior to the opening of the facility area to parking operations, the Operations Coordinator and the Contractor superintendent shall inspect the facility to be opened to insure it is free of debris, properly marked and ready for use. The Contractor shall immediately correct any deficiencies to the satisfaction of the Operations Coordinator in accordance with these specifications.
- c. The Contractor shall perform the contract in accordance with any order (including, but not limited to, instruction, direction, interpretation, or determination) issued by an authorized representative in accordance with his/her authority to act for the Owner but the Contractor assumes all the risk and consequences of performing the contract in accordance with any order (including but not limited to instruction, direction, interpretation, or determination) of anyone not authorized to issue such order.

2. CONFORMITY WITH PLANS AND SPECIFICATIONS

All work and all materials furnished shall be in reasonably close conformity (*meet industry standards*) with the lines, grades, grading sections, cross sections, dimensions, material requirements, and testing requirements that are specified (including specified tolerances) in the contract, plans or specifications.

If the Owner finds the materials furnished, work performed, or the finished product are not in reasonably close conformity with the plans and specifications and have resulted in an unacceptable finished product, the affected work or materials shall be removed and replaced or otherwise corrected by and at the expense of the Contractor in accordance with the Owner's written orders.

If the Owner's Representative finds the materials furnished, work performed, or the finished product not within reasonably close conformity with the plans and specifications but that the portion of the work affected will, in his/her opinion, result in a finished product having a level of safety, economy, durability, and workmanship acceptable to the Owner, he will advise the Owner of his/her determination that the affected work be accepted and remain in place. In this event, the Owner's Representative will document his/her determination and recommend to the Owner a basis of acceptance which will provide for an adjustment in the contract price for the affected portion of the work. The Owner's Representative's determination and recommended contract price adjustments will be based on good engineering judgment and such tests or retests of the affected work as are, in his/her opinion, needed. Changes in the contract price shall be covered by contract modifications (change order or supplemental agreement) as applicable.

For the purpose of this subsection, the term "reasonably close conformity" shall not be construed as waiving the Contractor's responsibility to complete the work in accordance with the contract, plans, and specifications. The term shall not be construed as waiving the Owner's right to insist on strict compliance with the requirements of the contract, plans, and specifications during the Contractor's prosecution of the work, when, in the Owner's opinion, such compliance is essential to provide an acceptable finished portion of the work.

For the purpose of this subsection, the term "reasonably close conformity" is also intended to provide the Owner with the authority to use good engineering judgment in his/her determinations as to acceptance of work that is not in strict conformity but will provide a finished product equal to or better than that intended by the requirements of the contract, plans and specifications.

3. COORDINATION OF CONTRACT, PLANS, AND SPECIFICATIONS

The contract, plans, specifications, and all referenced standards cited are essential parts of the contract requirements. A requirement occurring in one is as binding as though occurring in all. They are intended to be complementary and to describe and provide for a complete work.

The Contractor shall not take advantage of any apparent error or omission on the plans or specifications. In the event the Contractor discovers any apparent error or discrepancy, he shall immediately submit a **Request for Information** to the Owner's Representative for his/her interpretation and decision, and such decision shall be final.

The entire work provided in these technical specifications and on the drawings shall be constructed and finished in every respect. All parts necessary for the proper and complete execution of the work whether the same may have been specifically mentioned or not, or

indicated on the drawings, shall be done and furnished and installed in a manner corresponding with the rest of the work as if the same were particularly described and specifically provided for herein. It is not intended that the drawings shall show every detailed piece of material or equipment, but such parts and pieces as may be necessary to satisfactorily complete any system in accordance with the best practices and regulatory requirements, even though not shown, shall be furnished and installed.

4. COOPERATION OF CONTRACTOR

The Contractor will be supplied with two (2) copies each of the plans and specifications. He shall have available on the work site at all times, one copy each of the plans and specifications. Additional copies of plans and specifications may be obtained by the Contractor from the Owner's Representative for the cost of reproduction.

The Contractor shall supervise and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the work in accordance with the Contract Documents. The Contractor shall cooperate with the Owner's Representative and his/her inspectors and with other contractors in every way possible. The Owner's Representative shall allocate the work and designate the sequence of construction in case of controversy between contractors. The contractor shall have a competent superintendent on the work site at all times who is fully authorized as his/her agent to supervise and direct the work. The superintendent shall be capable of reading and thoroughly understanding the plans and specifications and shall receive and fulfill instructions from the Owner's Representative. The superintendent shall not be replaced without written notice to and approval by the Owner. The superintendent shall speak and fully understand the English language.

The Contractor shall be solely responsible for the means, methods, techniques, sequences and procedures of the construction of the work. The Contractor shall be responsible to see that all completed work complies with the Contract Documents.

5. COOPERATION BETWEEN CONTRACTORS

The Owner reserves the right to contract for and perform other or additional work on or near the work covered by this contract.

When separate contracts are let within the limits of any one project, each Contractor shall conduct his/her work so' as not to interfere with or hinder the progress of completion of the work being performed by other Contractors. Contractors working on the same project shall cooperate with each other as directed.

Each Contractor involved shall assume all liability, financial or otherwise, in connection with his/her contract and shall protect and save harmless the Owner and Program Manager from any and all damages or claims that may arise because of inconvenience, delays, or loss experienced by him/her because of the presence and operations of other Contractors working within the limits of the same project.

The Contractor shall arrange his/her work and shall place and dispose of the materials being used so as not to interfere with the operations of the other Contractors within the limits of the same project; He shall join his/her work with that of the others in an acceptable manner and shall perform it in proper sequence to that of the others.

In the event, should a conflict arise between contractors, that a coordination dispute cannot be resolved by the contractors, the Owner's Representative will decide the conflict and his decision will be final.

6. AUTOMATICALLY CONTROLLED EQUIPMENT

Whenever batching or mixing plant equipment is required to be operated automatically under the contract and a breakdown or malfunction of the automatic controls occurs, the equipment may be operated manually or by other methods for a period 48 hours following the breakdown or malfunction, provided this method of operations will produce results which conform to all other requirements of the contract.

7. AUTHORITY AND DUTIES OF INSPECTORS

Inspectors employed by the Owner's Representative shall be authorized to inspect all work done and all material furnished. Such inspection may extend to all or any part of the work and to the preparation, fabrication, or manufacture of the materials to be used. Inspectors are not authorized to revoke, alter, or waive any provision of the contract. Inspectors are not authorized to issue instructions contrary to the contract documents, plans and specifications or to act as foreman for the Contractor.

Inspectors employed by the Owner's Representative are authorized to notify the Contractor or his/her Representatives of any failure of the work or materials to conform to the requirements of the contract documents, plans, or specifications and to reject such nonconforming materials in question until such issues can be referred to the Owner for his/her decision.

8. INSPECTION OF THE WORK

All materials and each part or detail of the work shall be subject to inspection by the Owner's Representative. The Owner's Representative shall be allowed access to all parts of the work and shall be furnished with such information and assistance by the Contractor as is required to make a complete and detailed inspection.

If the Owner's Representative requests it, the Contractor, at the time of the request or at a time acceptable to both parties, shall remove or uncover such portions of the finished work as may be directed. After examination, the Contractor shall restore said portions of the work to the standard required by the specifications. Should the work thus exposed or examined prove acceptable, the uncovering, or removing, and the replacing of the covering or making good of the parts removed will be paid for as extra work; but should the work so exposed or examined prove unacceptable, the uncovering, or removing, and the replacing of the covering or making good of the parts removed will be at the Contractor's expense.

Any work done or materials used without supervision or inspection by an authorized representative of the Owner may be ordered removed and replaced at the Contractor's expense unless the Owner's representative failed to inspect after having been given reasonable notice in writing that the work was to be performed.

Should the contract work include relocation, adjustment, or any other modification to existing facilities, not the property of the Owner, authorized representatives of the owners of such facilities shall have the right to inspect such work. Such inspection shall in no sense make any facility owner a party to the contract, and shall in no way interfere with the rights of the parties to this contract.

9. REMOVAL OF UNACCEPTABLE AND UNAUTHORIZED WORK

All work which does not conform to the requirements of the contract, plans, and specifications will be considered unacceptable, unless otherwise determined acceptable by the Owner as provided in the subsection titled **CONFORMITY WITH PLANS AND SPECIFICATIONS** of this section.

Unacceptable work, whether the result of non-conformance, poor workmanship, use of defective materials, damage through carelessness, or any other cause found to exist prior to the final acceptance of the work, shall be removed immediately and replaced in an acceptable manner in accordance with the provisions of the subsection titled **CONTRACTOR'S RESPONSIBILITY FOR WORK**, Article 11 of Section 00750.

Work done contrary to the instructions of the Owner's Representative, work done beyond the lines shown on the plans or as given, except as herein specified, or any extra work done without authority, will be considered as unauthorized and will not be paid for under the provisions of the contract. Work so done may be ordered removed or replaced at the Contractor's expense.

Upon failure on the part of the Contractor to comply with any order of the Owner's Representative made under the provisions of this subsection, the Owner's Representative will have authority to cause unacceptable work to be remedied or removed and replaced and unauthorized work to be removed and to deduct the costs incurred by the Owner from any monies due or to become due the Contractor.

10. LOAD RESTRICTIONS

The Contractor shall comply with all legal load restrictions in the hauling of materials on public roads beyond the limits of the work. A special permit will not relieve the Contractor of liability for damage which may result from the moving of material or equipment.

The operation of equipment of such weight or so loaded as to cause damage to structures or to any other type of construction will not be permitted. Hauling of materials over the base course or surface course under construction shall be limited as directed. No loads will be permitted on a concrete pavement, base, or structure before the expiration of the curing period. The

Contractor shall be responsible for all damage done by his/her hauling equipment and shall correct such damage at his/her own expense.

11. MAINTENANCE DURING CONSTRUCTION

The Contractor shall maintain the work during construction and until the work is accepted. This maintenance shall constitute continuous and effective work prosecuted day by day, with adequate equipment and forces so that the work is maintained in satisfactory condition at all times.

In the case of a contract for the placing of a course upon a course or subgrade previously constructed, the Contractor shall maintain the previous course or subgrade during all construction operations.

All costs of maintenance work during construction and before the project is accepted shall be included in the bid and the Contractor will not be paid an additional amount for such work.

12. FAILURE TO MAINTAIN THE WORK

Should the Contractor at any time fail to maintain the work as provided in the subsection titled MAINTENANCE DURING CONSTRUCTION of this section, the Owner's Representative shall immediately notify the Contractor of such noncompliance. Such notification shall specify a reasonable time within which the Contractor shall be required to remedy such unsatisfactory maintenance condition. The time specified will give due consideration to the situation that exists.

Should the Contractor fail to respond to the Owner's Representative's notification, the Owner's Representative may suspend any work necessary for the Owner to correct such unsatisfactory maintenance condition, depending on the situation that exists. Any maintenance cost incurred by the Owner, shall be deducted from monies due or to become due the Contractor.

13. PARTIAL ACCEPTANCE

If at any time during the prosecution of the project the Contractor substantially completes a usable unit, phase or portion of the work, the occupancy of which will benefit the Owner, he may request the Owner to make final inspection of that unit. If the Owner finds upon inspection that the unit has been satisfactorily completed in compliance with the contract, he may accept it as being completed, and the Contractor may be relieved of further responsibility for that phase. Such partial acceptance and beneficial occupancy by the Owner shall not void or alter any provision of the contract. Partial acceptance must be made in writing to the Contractor.

14. FINAL ACCEPTANCE

Upon due notice from the Contractor of substantial completion of each phase, the Owner's Representative and Owner will make an inspection. If all construction provided for and

contemplated by the contract is found to be completed in accordance with the contract, plans, and specifications, such inspection shall constitute the final inspection.

If, however, the inspection discloses any work, in whole or in part, as being unsatisfactory, the Owner's Representative will give the Contractor the necessary instructions for correction of same and the Contractor shall immediately comply with and execute such instructions. Upon correction of the work, another inspection will be made which shall constitute the final inspection, provided the work has been satisfactorily completed. In such event, the Owner or Owner's Representative will make the final acceptance and notify the Contractor of this acceptance as of the date of final inspection

15. CLAIMS FOR ADJUSTMENT AND DISPUTES

If for any reason the Contractor deems that additional compensation is due him/her for work or materials not clearly provided for in the contract, plans, or specifications or previously authorized as extra work, he shall notify the Owner's Representative in writing of his/her intention to claim such additional compensation before he begins the work on which he bases the claim. If such notification is not given or the Owner is not afforded proper opportunity by the Contractor for keeping strict account of actual cost as required, then the Contractor hereby agrees to waive any claim for such additional compensation. Such notice by the Contractor and the fact that the Owner's Representative has kept account of the cost of the work shall not in any way be construed as proving or substantiating the validity of the claim. When the work on which the claim for additional compensation is based has been completed, the Contractor shall, within 10 calendar days, submit his/her written claim to the Owner's Representative who will present it to the Owner for consideration in accordance with local laws or ordinances.

Nothing in this subsection shall be construed as a waiver of the Contractor's right to dispute final payment based on differences in measurements or computations. Additional details and procedures for claims and disputes are shown in Section 00850.

16. ADDITIONAL INSTRUCTIONS AND DETAIL DRAWINGS

The Contractor will be furnished additional instructions and detail drawings if necessary to carry out the work included in the contract. Any such additional drawings shall become part of the Contract and shall be as binding upon the parties hereto as if they were enumerated herein.

17. SHOP DRAWINGS AND SAMPLES

a. General

The Owner may require shop drawings and/or samples for any materials or equipment to be furnished or for any construction methods to be employed. No work will be allowed to proceed for which shop drawings or samples have been requested until such drawings or samples have been provided by the Contractor and approved by the Owner. (Reference Section 01330.)

b. Contractor's Responsibilities

All materials and construction shall be in accordance with finally reviewed shop drawings, material tests, or the like as required. The purchase of, manufacture, or delivery to the site of any materials before final approval of applicable shop drawings, material tests, etc. will be entirely at the risk of the Contractor.

The Contractor shall be solely responsible for the correctness of all shop drawings, material quantities, and for the correct fitting of the members and parts shown on the shop drawings. The Owner's review shall be only for conformance with the design concepts of the Contract work and for conformance with the information given in the plans and specifications. The Owner's review of separate items shall not be taken as an approval of any complete assembly in which the separate items are incorporated.

It shall be understood that the Owner's review of shop drawings does not in any way relieve the Contractor of his/her sole responsibility for completing all work in strict accordance with the plans and specifications nor of his/her sole responsibility to see that all parts of the work fit with each other so that the completed work is entirely satisfactory to the Owner's Representative and Owner.

c. Submission to Owner

Before submittal to the Owner, the Contractor shall check all shop drawings or samples for conformance with the Contract Documents, including the plans and specifications, for suitability and satisfactory incorporation in the completed Contract work, and for correct dimensions, ratings and assembly, and shall note legibly on each drawing or sample that he has verified its acceptability and that he approves it. If there are any deviations in the shop drawings or samples from the plans and specification, the Contractor shall so note it legibly on the shop drawings or samples and also inform the Owner separately in writing of any such deviation. The Contractor shall submit shop drawings and samples in orderly sequence matched to the construction work, with sufficient completeness to enable review, with reasonable promptness, and allowing sufficient time for the Owner to review them. All shops drawings related to building finishes shall be submitted at one time, so that all finishes may be reviewed simultaneously; All shop drawings and samples shall be properly identified as to their location and application in the Contract work and as to their association with various parts of the plans and specifications.

d. Form of Shop Drawings

Shop drawings may include general, assembly and detail drawings, diagrams, illustrations, material and equipment schedules with manufacturer's name and catalog numbers and description, performance charts, catalog cuts, brochure and such other information and data as is necessary and required by the Owner for any part of the Contract work.

e. Re-submittal

If shop drawings or samples are not accepted by the Owner, the Contractor shall correct or make changes as noted and shall resubmit revised shop drawings or new samples until accepted by the Owner.

f. Shop Drawings Required

The Owner's Representative may require, and the Contractor shall provide, shop drawings giving information on any part of the Contract work which in the opinion of the Owner's Representative are necessary or desirable to evaluate conformance to the plans and specifications.

18. RECORD DRAWINGS

A complete set of drawings shall be kept updated at the job site, shall have all approved changes clearly and accurately marked on them by the Contractor and shall indicate the word as-built. **This complete set of drawings shall be delivered by the Contractor, in good condition, to the Owner at the completion of the work before the time when the final payment shall be due and payable. The Contractor, at all times during the Project shall make available the updated mark-up set for review and/or verification by Owner on a monthly basis. Failure to provide updated RECORD DRAWINGS can delay Payment Application.** (Reference Section 01720.) The Owner shall be entitled to rely upon the completeness and accuracy of the record drawing information provided by the Contractor without further verification.

END OF SECTION 00730

SECTION 00731

SPECIFICATIONS AND DRAWINGS

DESCRIPTION

1. SPECIFICATIONS AND DRAWINGS

For convenience, the specifications are arranged into several sections, but such separation shall not be considered as the limits of the work required of any separate trade. The terms and conditions of such limitations are wholly between the Contractor and his/her subcontractors. Requirements contained in any section are required as if contained in all sections and are the responsibility of the Contractor. The Contractor, prior to awarding subcontracts, will assure the work required as a whole has been coordinated among the subcontracts.

2. SUMMARY OF THE ORDER OF PRECEDENCE

In case of conflicts between the contract documents the order of precedence shall be as follows:

- a. Modifications or changes last in time are first in precedence.
- b. Addenda.
- c. Bid Form & Contract Requirements Specifications.
- d. Technical Specifications.
- e. Drawings.
- f. In the event where provisions of codes, safety orders, contract documents, referenced manufacturer's specifications or industry standards are in conflict, the more restrictive and higher quality shall govern.

*Note: Should there be conflict among the Bid Form and Contract Requirements, Technical Specifications and Plans, the more restrictive will apply. *Should there be a conflict between the Technical Specifications and the Front End Specifications, the Front End Specifications will govern.*

END OF SECTION 00731

SECTION 00750

LEGAL REGULATIONS AND RESPONSIBILITY TO PUBLIC

DESCRIPTION

1. LAWS TO BE OBSERVED

The Contractor shall keep fully informed of all Federal, State and Airport laws, all local laws, ordinances, and regulations and all orders and decrees of bodies or tribunals having any jurisdiction or authority, which in any manner affect those engaged or employed on the work, or which in any way affect the conduct of the work. He/she shall at all times observe and comply with all such laws, ordinances, regulations, orders, and decrees; and shall protect and indemnify the Owner and all his/her officers, agents, representatives or servants against any claim or liability arising from or based on the violation of any such law, ordinance, regulation, order, or decree, whether by himself/herself or his/her representatives, employees, subcontractors, suppliers, or material men. Confirm and adhere to Airport Security Directives.

2. PERMITS, LICENSES, AND TAXES

The Contractor shall procure all permits and licenses, pay all charges, fees, and taxes, and give all notices necessary and incidental to the due and lawful prosecution of the work.

3. PATENTED DEVICES, MATERIALS, AND PROCESSES

If the Contractor is required or desires to use any design, device, material, or process covered by letters of patent or copyright, he shall provide for such use by suitable legal agreement with the patentee or owner and shall pay all appropriate license fees, royalties and all costs incident to the use in performance of the work. The Contractor and the Surety shall indemnify and save harmless the Owner and Owner's Representative, any third party, or political subdivision from any and all claims for infringement by reason of the use of any such patented design, device, material or process, or any trademark or copyright, and shall indemnify the Owner and Owner's Representative for any costs, expenses, and damages which it may be obliged to pay by reason of an infringement, at any time during the prosecution or after the completion of the work.

4. RESTORATION OF SURFACES DISTURBED BY OTHERS.

The Owner reserves the right to authorize the construction, reconstruction, or maintenance of any public or private utility service, or a utility service of another government agency at any time during the progress of the work.

Should the owner of a public or private utility service, or a utility service of another government agency be authorized to construct, reconstruct, or maintain such utility service or facility during the progress of the work, the Contractor shall cooperate with such owners by arranging and performing the work in this contract so as to facilitate such construction,

reconstruction or maintenance by others. When ordered as extra work by the Owner, the Contractor shall make all necessary repairs to the work which are due to such authorized work by others, unless otherwise provided for in the contract, plans, or specifications. It is understood and agreed that the Contractor shall not be entitled to make any claim for damages due to such authorized work by others or for any delay to the work resulting from such authorized work.

5. SANITARY, HEALTH, AND SAFETY PROVISIONS

Before beginning its work, the Contractor shall notify the Owner in writing that the Contractor has prepared a Contractor's safety program that implements all of the Contractor's responsibilities hereunder. The Contractor shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the work. The Contractor shall take all necessary precautions for the safety of and shall provide the necessary protection to prevent damage, injury or loss to:

- a. All employees on the Project and other persons and organizations who may be affected thereby;
- b. All the work and materials and equipment to be incorporated therein, whether in storage on or off the site; and
- c. Other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities and underground facilities not designated for removal, relocation or replacement in the course of construction.

The Contractor shall comply with all applicable laws and regulations of any public body having jurisdiction for the safety of persons or property or to protect them from damage, injury or loss and shall erect and maintain all necessary safeguards for such safety and protection.

In emergencies affecting the safety or protection of persons or the work or property at the site or adjacent thereto, the Contractor, without special instruction or authorization from the Owner, is obligated to act to prevent threatened damage, injury or loss. The Contractor shall give the Owner prompt written notice if the Contractor believes that any significant changes in the work or variations from the Contract Documents have been caused thereby.

The Contractor shall designate a responsible representative at the site whose duty shall be the prevention of accidents. The person shall be designated in writing by the Contractor to and accepted by the Owner.

6. PUBLIC CONVENIENCE AND SAFETY

The Contractor shall control his/her operations and those of his/her subcontractors and all suppliers, to assure the least inconvenience to the traveling public. Under all circumstances safety shall be the most important consideration.

The Contractor shall maintain the free and unobstructed movement of aircraft and vehicular traffic with respect to his/her own operations and those of his/her subcontractors and all suppliers in accordance with the subsection titled MAINTENANCE OF TRAFFIC of Section

00720 hereinbefore specified and shall limit such operations for the convenience and safety of the traveling public as specified in the subsection titled CONTROL OF OPERATIONS of Section 00760 hereinafter.

7. PROTECTION AND RESTORATION OF PROPERTY AND LANDSCAPE

The Contractor shall be responsible for the preservation of all public and private property, and shall protect carefully from disturbance or damage all land monuments and property markers until the Owner has witnessed or otherwise referenced their location and shall not move them until directed. The Contractor shall notify owners of adjacent property and of underground facilities and utility owners when prosecution of the work may affect them and shall cooperate with them in the protection, removal, relocation and replacement of their property.

The Contractor shall be responsible for all damage or injury to property of any character, during the prosecution of the work, resulting from any act, omission, neglect, or misconduct in his/her manner or method of executing the work, or at any time due to defective work or materials, and said responsibility will not be released until the project shall have been completed and accepted.

When or where any direct or indirect damage or injury is done to public or private property by or on account of any act, omission, neglect, or misconduct in the execution of the work, or in consequence of the non-execution thereof by the Contractor, he shall restore, at his/her own expense, such property to a condition similar or equal to that existing before such damage or injury was done, by repairing, or otherwise restoring as may be directed, or he shall make good such damage or injury in an acceptable manner.

8. RESPONSIBILITY FOR DAMAGE CLAIMS

The Contractor shall indemnify, defend and hold harmless the Owner's Representative, the Architect/Engineer, and the Owner and their officers, employees, representatives, and agents from all suits, actions, claims, damages or costs (including attorneys' fees and costs) of any character brought because of any injuries or damage received or sustained by any person, persons, or property on account of the operations of the Contractor; or on account of or in consequence of any neglect in safeguarding the work; or through use of unacceptable materials in constructing the work; or because of any act or omission, neglect, or misconduct of said Contractor; or because of any claims or amounts recovered from any infringements of patent, trademark, or copyright; or from any claims or amounts arising or recovered under the "Workmen's Compensation Act", or any other law, ordinance, order, or decree. Money due the Contractor under and by virtue of his/her contract as may be considered necessary by the Owner for such purpose may be retained for the use of the Owner or, in case no money is due, his/her Surety may be held until such suit or suits, action or actions, claim or claims for injuries or damages as aforesaid shall have been settled and suitable evidence to that effect furnished to the Owner, except that money due the Contractor will not be withheld when the Contractor produces satisfactory evidence that he is adequately protected by public liability and property damage insurance.

9. THIRD PARTY BENEFICIARY CLAUSE

It is specifically agreed between the parties executing the contract that it is not intended by any of the provisions of any part of the contract to create in the public or any member thereof a third party beneficiary of any right created by the Contract Documents or by operation of law.

10. OPENING: SECTIONS OF THE WORK TO TRAFFIC

Should it be necessary for the Contractor to complete portions of the contract work for the beneficial occupancy of the Owner prior to completion of the entire contract, such "phasing" of the work shall be specified herein and indicated on the plans. When so specified, the Contractor shall complete such portions of the work on or before the date specified or as otherwise specified. The Contractor shall make his/her own estimate of the difficulties involved in arranging his/her work to permit such beneficial occupancy by the Owner.

Upon completion of any portion of the work to allow beneficial occupancy by the Owner, such portion shall be accepted by the Owner in accordance with the subsection titled PARTIAL ACCEPTANCE of Section 00730.

No portion of the work may be opened by the Contractor for public use until ordered by the Owner in writing. Should it become necessary to open a portion of the work to public traffic on a temporary or intermittent basis, such openings shall be made when, in the opinion of the Owner, such portion of the work is in an acceptable condition to support the intended traffic. Temporary or intermittent openings are considered to be inherent in the work and shall not constitute either acceptance of the portion of the work so opened or a waiver of any provision of the contract. Any damage to the portion of the work so opened that is not attributable to traffic which is permitted by the Owner shall be repaired by the Contractor at his/her expense. The Contractor shall make his/her own estimate of the inherent difficulties involved in completing the work under the conditions herein described and shall not claim any added compensation by reason of delay or increased cost due to opening a portion of the contract work.

11. CONTRACTOR'S RESPONSIBILITY FOR WORK

Until the Owner's final written acceptance of the entire completed work, excepting only the portions of the work accepted in accordance with the subsection titled PARTIAL ACCEPTANCE of Section 00730, the Contractor shall have the charge and care thereof and shall take every precaution against injury or damage to any part due to the action of the elements or from any other cause, whether arising from the execution or from the non-execution of the work. The Contractor shall rebuild, repair, restore, and make good all injuries or damages to any portion of the work occasioned by any of the above causes before final acceptance and shall bear the expense thereof except damage to the work due to unforeseeable causes beyond the control of and without the fault or negligence of the Contractor, including but not restricted to acts of God such as earthquake, tidal wave, tornado, hurricane or other cataclysmic phenomenon of nature, or acts of the public enemy or of government authorities.

If the work is suspended for any cause whatever, the Contractor shall be responsible for the work and shall take such precautions necessary to prevent damage to the work. The Contractor shall provide for normal drainage and shall erect necessary temporary structures, signs, or other facilities at his/her expense. The Contractor is responsible for maintaining the integrity of all sediment and erosion controls throughout the life of a project, including when work is temporarily suspended, unless otherwise directed by the Owner or the Owner's Representative. During such period of suspension of work, the Contractor shall properly and continuously maintain in an acceptable growing condition all living material in newly established planting, seedlings, and soddings furnished under his/her contract, and shall take adequate precautions to protect new tree growth and other vegetative growth against injury.

12. CONTRACTOR'S RESPONSIBILITY FOR UTILITY SERVICE AND FACILITIES OF OTHERS

As provided in the subsection titled RESTORATION OF SURFACES DISTURBED BY OTHERS of this section, the Contractor shall cooperate with the owner of any public or private utility service, FAA, or a utility service of another government agency that may be authorized by the Owner to construct, reconstruct or maintain such utility services or facilities during the progress of the work. In addition, the Contractor shall control his/her operations to prevent the unscheduled interruption of such utility services and facilities.

To the extent that such public or private utility services, FAA facilities, or utility services of another governmental agency are known to exist within the limits of the contract work, the approximate locations may be indicated on the plans.

It is understood and agreed that the Owner does not guarantee the accuracy or the completeness of the location information relating to existing utility services, facilities, or structures that may be shown on the plans or encountered in the work. Any inaccuracy or omission in such information shall not relieve the Contractor of his/her responsibility to protect such existing features from damage or unscheduled interruption of service.

It is further understood and agreed that the Contractor shall, upon execution of the contract, notify the owners of all utility services or other facilities of his/her plan of operations. A copy of each notification shall be given to the Owner.

In addition to the general written notification hereinbefore stated it shall be the responsibility of the Contractor to keep such individual owners and/or tenants advised of changes in his/her plan of operations that would affect such owners or tenants.

Prior to commencing the work in the general vicinity of an existing utility service or facility, the Contractor shall again notify each such owner or tenant of his/her plan of operation. If, in the Contractor's opinion, the Owner's assistance is needed to locate the utility service or facility or the presence of a representative of the Owner is desirable to observe the work, such advice should be included in the notification. The Contractor shall furnish a written summary of the notification to the Owner's Representative.

The Contractor's failure to give two (2) business days' notice herein above provided shall be cause for the Owner to suspend the Contractor's operations in the general vicinity of a utility service or facility.

Where the outside limits of an underground utility service have been located and staked on the ground, the Contractor shall be required to use excavation methods acceptable to the Owner within 3 feet (90 cm) of such outside limits at such points as may be required to ensure protection from damage due to the Contractor's operations.

Should the Contractor damage or interrupt the operation of a utility service or facility by accident or otherwise, he shall immediately notify the proper authority and the Owner and shall take all reasonable measures to prevent further damage or interruption of service. The Contractor, in such events, shall cooperate with the utility service or facility owner and the Owner continuously until such damage has been repaired and service restored to the satisfaction of the utility or facility owner.

The Contractor shall bear all costs of damage and restoration of service to any utility service or facility due to his/her operations whether or not due to negligence or accident. The Owner reserves the right to deduct such costs from any monies due or which may become due the Contractor, or his/her Surety.

13. FURNISHING RIGHTS-OF-WAY

The Owner will be responsible for furnishing all rights-of-way upon which the work is to be constructed in advance of the Contractor's operations.

14. PERSONAL LIABILITY OF PUBLIC OFFICIALS

In carrying out any of the contract provisions or in exercising any power or authority granted to him/her by this contract, there shall be no liability upon the Owner's Representative, his/her authorized representatives, or any officials of the Owner either personally or as an official of the Owner. It is understood that in such matters they act solely as agents and representatives of the Owner.

15. NO WAIVER OF LEGAL RIGHTS

Upon completion of the work, the Owner will expeditiously make final inspection and notify the Contractor of final acceptance. Such final acceptance, however, shall not preclude or stop the Owner from correcting any measurement, estimate, or certificate made before or after completion of the work, nor shall the Owner be precluded or stopped from recovering from the Contractor or his/her Surety, or both, such overpayment as may be sustained, or by failure on the part of the Contractor to fulfill his/her obligations under the contract. A waiver on the part of the Owner of any breach of any part of the contract shall not be held to be a waiver of any other or subsequent breach.

The Contractor, without prejudice to the terms of the contract, shall be liable to the Owner for latent defects, fraud, or such gross mistakes as may amount to fraud, or as regards the Owner's rights under any warranty or guaranty.

16. ENVIRONMENTAL PROTECTION

The Contractor shall be knowledgeable of, and comply with all federal, state, and local laws and regulations controlling pollution of, or undue harm to, the environment. The Contractor shall take all necessary precautions to prevent air pollution, water pollution, and non-permitted damage to regulated natural and cultural resources in accordance with these laws and regulations.

Air Pollution

- Control of dust and other airborne particulates shall be the responsibility of the Contractor, and the Contractor will adhere to specifications found in the Federal Aviation Administration (FAA) Advisory Circular (AC) 150/5370-10A, “Standards for Specifying Construction of Airports” in order to control or minimize construction-related particulate emissions.
- Additionally, the Contractor will exercise Best Management Practices (BMPs) relating to dust control as described in the New Hampshire Department of Environmental Services’ (NHDES) “Stormwater Management and Erosion and Sediment Control Handbook for Urban and Developing Areas in New Hampshire”, August of 1992 (known informally as the “Green Book”). This information is found within Chapter 7, on pages 7-257 and 7-258.

Water Pollution

- The Contractor will be held to be in compliance with all applicable environmental regulations and permit conditions. This includes following all performance objectives set forth in Manchester Airport’s Stormwater Pollution Prevention Plan (SWPPP) in accordance with the regulations governing such plans in the US Environmental Protection Agency’s (US EPA) National Pollutant Discharge Elimination System (NPDES) construction general permit.
- The Contractor will adhere to conditions set forth in the permit issued for New Hampshire Administrative Rules Env-Ws 415 of NH State Statute RSA 485-A:17 (known as the “Alteration of Terrain Permit Program”, or the “Site Specific Permit Program”), with reference to the BMP and all permit specifications (Application #).
- The Contractor will be expected to meet conditions specified in the New Hampshire Water Quality Certificate issued under Section 401 of the Clean Water Act, as amended.
- In following the Stormwater Pollution Prevention Plan (SWPPP) performance objectives, the Contractor will abide by all Best Management Practices (BMP) so indicated for the project within the SWPPP. These will include, but are not limited to: US Department of Transportation “Best Management Practices for Erosion and Sediment Control” Report Number FHWA-FLP-94-005, June 1995; and its reliance upon American Association of State Highway and Transportation Officials (AASHTO) “Guidelines for

- The Contractor shall also be aware of erosion and sediment control language within section 4.07 (Storm Drain Plans) of the Town of Londonderry, New Hampshire “Site Plan Regulations”; and VI.5 (Surface Water Drainage) within the Manchester, New Hampshire “Subdivision and Site Plan Regulations”
- Any staging areas utilized by the Contractor during construction operations and meeting the definition of a support activity area (as defined in the US Environmental Protection Agency’s [US EPA] National Pollutant Discharge Elimination System [NPDES] construction general permit for New Hampshire) will be subject to BMP’s and other guidance specified in the SWPPP that the Contractor is responsible for implementing. It should be noted that these staging areas do not have to be located at the construction site in order to be covered under provisions of the SWPPP.

- The Contractor is responsible for the proper handling, storage, and/or disposal of hazardous materials used or generated during the course of the project. Such materials may include, but are not limited to motor vehicle fuels, waste oils and lubricants, paints, lacquers, paint thinners, and solvents. Should a spill or accidental release of hazardous materials occur during the course of the project, the Contractor shall be responsible for transmitting all pertinent data through the resident engineer, to the designated Airport contact. Under the direction of the Airport, the Contractor shall subsequently report the spill to the New Hampshire Department of Environmental Services (NHDES) and proceed under NHDES direction to effect such clean up measures as may be deemed necessary by the NHDES. The Contractor shall be responsible for cost of testing, removal, and proper disposal of any hazardous material released as a result of their actions, or those of their employees, consultants, or subcontractors. The designated Airport personnel will inspect hazardous material storage, including petroleum products. Hazardous materials should be properly labeled to identify contents, should be stored out of contact with storm water, and should not adversely affect water, soil, or air quality. In the event of a spill, the Contractor's EPA Generator Identification number will be used on all documents for all disposal/removal purposes. The Airport's EPA Generator number will not be used to identify the Airport as the generator of the hazardous waste on any documents.
- Should potentially hazardous materials other than that generated or released by the Contractor be encountered in soil, surface water, or groundwater at any time during the completion of the project, all work shall be ceased until such time as it can be determined that it is safe to proceed. Upon discovery of any suspected hazardous

material, the Contractor, through its resident engineer, shall notify the designated Airport contact. It will thereafter be the responsibility of the Airport or their designated consultant to determine the nature of the material, to notify the appropriate regulatory agencies, effect appropriate remedial measures, and approve the commencement of work activities.

- At no time shall any Contractor personnel work in a potentially hazardous environment unless certified to do so under 29 CFR 1910.
- At all times the Contractor shall be responsible for satisfying the City of Manchester Department of Aviation, State of New Hampshire, US Environmental Protection Agency, and the Occupational Safety and Health Administration requirements for handling, storage, and disposal of potentially hazardous materials.

Additional Considerations

- Aside from the environmental regulations and permit conditions specified above, the Contractor is responsible for understanding and following all other applicable federal, state, and local laws and regulations.
- Unless otherwise specified in this subsection, the Contractor is advised that the site of the work is not within any property, district, or site, and does not contain any building, structure, or object listed in the current National Register of Historic Places published by the United States Department of Interior.
- Should the Contractor encounter, during his/her operations, any building, part of a building, structure, or object which is incongruous with its surroundings, he shall immediately cease operations in that location and notify the Owner. The Owner will immediately investigate the Contractor's finding and will direct the Contractor to either resume his/her operations or to suspend operations as directed.
- Should the Owner order suspension of the Contractor's operations in order to protect an archaeological or historical finding, or order the Contractor to perform extra work, such shall be covered by an appropriate contract modification (change order or supplemental agreement) as provided in the subsection titled EXTRA WORK of Section 00720 and the subsection titled PAYMENT FOR EXTRA WORK AND FORCE ACCOUNT WORK of Section 01290. If appropriate, the contract modification shall include an extension of contract time in accordance with the subsection titled DETERMINATION AND EXTENSION OF CONTRACT TIME of Section 00760.

17. ADDITIONAL OR SUBSTITUTE BOND

If at any time the Owner for justifiable cause shall be or become dissatisfied with any Surety or sureties, then upon the Performance or Payment Bonds, the Contractor shall within five (5) days after notice from the Owner to do so, substitute an acceptable bond (or bonds) in such form and sum signed by such other surety or sureties as may be satisfactory to the Owner. The premiums on such bond shall be paid by the Contractor. No further payments shall be deemed due nor shall be made until the new surety or sureties shall have furnished such an acceptable bond to the Owner.

18. GENERAL GUARANTY

Neither the final certificate of payment nor any provision in the Contract Documents, nor partial or entire occupancy of the premises by the Owner, shall constitute any acceptance of work not done in accordance with the Contract Documents or relieve the Contractor of liability in respect to any express warranties or responsibility for faulty materials or workmanship. The Contractor shall remedy any defects in the work and pay for any damage to other work resulting therefrom, which shall appear within a period of one year from the date of final acceptance of the work unless a longer period is specified. The Owner will give notice of observed defects with reasonable promptness.

19. NOTICE AND SERVICE THEREOF

Any notice to any Contractor from the Owner relative to any part of the contract shall be in writing and considered delivered and the service thereof completed, when said notice is posted, by certified or registered mail, to the said Contractor at his last given address, or delivered in person to the said Contractor or his authorized representative on the work.

20. PRESS RELEASES

All press releases or other published information in any way concerning this Contract or the Work hereunder, which the Contractor or any of its subcontractors desires to make, shall be subject to approval by the Owner prior to release. Request for such releases shall be sent to the Owner's Representative for review and approval.

END OF SECTION 00750

SECTION 00760

PROSECUTION AND PROGRESS

DESCRIPTION

1. SUBLETTING OF CONTRACT

The Contractor shall at all times when work is in progress be represented either in person, by a qualified superintendent, or by other designated, qualified representative who is duly authorized to receive and execute orders of the Owner.

Should the Contractor elect to assign his/her contract, said assignment shall be concurred in by the Surety, shall be presented for the consideration and approval of the Owner, and shall be consummated only on the written approval of the Owner. In case of approval, the Contractor shall file copies of all subcontracts with the Owner.

2. NOTICE TO PROCEED

Issuance of a Work Order shall serve as the Notice to Proceed and shall state the date on which it is expected the Contractor will begin the construction and from which date contract time will be charged. The Contractor shall begin the work to be performed under the contract on the date set by the written Notice To Proceed and shall notify the Owner at least 72 hours in advance of the time actual construction operations will begin.

3. PROSECUTION AND PROGRESS

As specified in Section 01310, PROGRESS SCHEDULE, the Contractor shall submit his/her progress schedule for the Owner's approval on or before the effective date of the Notice to Proceed. The Contractor's progress schedule, when approved by the Owner, may be used to establish major construction operations and to check on the progress of the work. The Contractor shall provide sufficient materials, equipment, and labor to guarantee the completion of the project in accordance with the plans and specifications within the time set forth in the contract.

4. CHARACTER OF WORKERS, METHODS, AND EQUIPMENT

The Contractor shall, at all times, employ sufficient competent labor and equipment for prosecuting the work to full completion in the manner and time required by the contract, plans, and specifications.

All workers shall have sufficient skill and experience to perform properly the work assigned to them. Workers engaged in special work or skilled work shall have sufficient experience in such work and in the operation of the equipment required to perform the work satisfactorily. All equipment which is proposed to be used on the work shall be of sufficient size and in such

condition as to meet requirements of the work and to produce a satisfactory quality of work. Equipment used on any portion of the work shall be such that no injury to previously completed work, adjacent property, or existing airport facilities will result from its use.

The Contractor shall not proceed with any work not clearly and consistently defined in detail in the Contract Documents, but shall request additional drawings, specifications, or instructions from the Owner by means of a *Request for Information (RFI)*. If the Contractor proceeds with such work without obtaining further drawings or instructions, he shall assume full responsibility for the results thereof, and if such work is discovered to be incorrect he shall correct it at his/her own expense.

The Contractor shall supervise and direct the work, using the Contractor's best skill and judgment. The Contractor shall be solely responsible and have control over construction means, methods, techniques, sequences, procedures, safety precautions, and for coordinating all portions of the work under the Contract. Should the Contract Documents refer to particular construction means, methods, techniques, sequences or procedures, or indicate or imply that such are to be used on the work, such mention is intended only to indicate that the operations of the Contractor shall be such as to produce at least the quality of work implied by the operations described, but that the actual determination of whether or not the described operations may be safely and suitably employed on the work shall be the sole responsibility of the Contractor. All injury, loss, damage or cost of correcting defective work arising from the employment of any construction means, methods, techniques, sequences or procedures shall be the sole responsibility of the Contractor, notwithstanding that such construction means, methods, techniques, sequences or procedures are referred to, indicated or implied by the Contract Documents, unless the Contractor has given timely notice to the Owner in writing that such means, methods, techniques, sequences or procedures are not safe or suitable, and the Contractor has then been instructed in writing to proceed at the Owner's risk.

Any person employed by the contractor, any subcontractor and their agents who in the opinion of the Owner's Representative, does not perform the work in proper and skillful manner, is disorderly or disrespectful, argumentative, or otherwise deemed undesirable, shall, at the written request of the Owner's Representative, be removed forthwith by the contractor, subcontractor, or their agents employing such person and shall not be employed again in any portion of the work without prior approval of the Owner's Representative.

5. TEMPORARY SUSPENSION OF THE WORK

The Owner may suspend the work wholly, or in part, for such period or periods as he may deem necessary, due to unsuitable weather, or such other conditions as are considered unfavorable for the prosecution of the work, or for such time as is necessary due to the failure on the part of the Contractor to carry out orders given or perform any or all provisions of the contract.

In the event that the Contractor is ordered by the Owner, in writing to suspend work for some unforeseen cause not otherwise provided for in the contract documents and over which the

Contractor has no control, the Contractor may be reimbursed for actual money expended on the work during the period of shutdown. No allowance will be made for anticipated profits. The period of shutdown shall be computed from the effective date of the Owner's order to suspend work to the effective date of the Owner's order to resume the work. Claims for such compensation shall be filed with the Owner within the time period stated in the Owner's order to resume work. The Contractor shall submit with his/her claim information substantiating the amount shown on the claim. No provision of this article shall be construed as entitling the Contractor to compensation for delays due to inclement weather, for suspensions made at the request of the Contractor, or for any other delay provided for in the contract, plans, or specifications.

If it should become necessary to suspend work for an indefinite period, the Contractor shall store all materials in such manner that they will not become an obstruction nor become damaged in any way. He shall take every precaution to prevent damage or deterioration of the work performed and provide for normal drainage of the work. The Contractor is responsible for maintaining the integrity of all sediment and erosion controls throughout the life of the project, including when work is temporarily suspended, unless otherwise directed by the Owner or Owner's Representative. The Contractor shall erect temporary structures where necessary to provide for traffic on, to, or from the airport.

6. DETERMINATION AND EXTENSION OF CONTRACT TIME

The number of calendar or working days allowed for completion of the work is stated in the proposal and contract documents and will be known as the CONTRACT TIME.

Should the contract time require extension for reasons beyond the Contractor's control, it shall be adjusted as follows:

- a. CONTRACT TIME based on CALENDAR DAYS shall consist of the number of calendar days stated in the contract counting from the effective date of the notice to proceed and including all Saturdays, Sundays, holidays, and non-work days. All calendar days elapsing between the effective dates of the Owner's orders to suspend and resume all work, due to causes not the fault of the Contractor, shall be excluded.
- b. When the contract time is a specified completion date, it shall be the date on which all contract work shall be completed.

If the Contractor finds it impossible for reasons beyond his/her control to complete the work within the contract time as specified, or as extended in accordance with the provisions of this subsection, he/she may, at any time prior to the expiration of the contract time as extended, made a written request to the Owner for an extension of time setting forth the reasons which he/she believes will justify the granting of his/her request. The Contractor's pleas that insufficient time was specified is not a valid reason for extension of time. If the Owner finds that the work was delayed because of conditions beyond the control and without the fault of the Contractor, the Owner may extend the time for completion in such amount as the conditions justify. The extended time for completion shall then be in full force and effect, the same as though it were the original time for completion.

7. FAILURE TO COMPLETE ON TIME

For each calendar day or working day, as specified in the contract, that any work remains uncompleted after the contract time (including all extension and adjustments as provided in subsection 7 of this section, titled DETERMINATION AND EXTENSION OF CONTRACT TIME) the sum specified in the contract and proposal as liquidated damages will be deducted from any money due or to become due the Contractor or his/her Surety. Such deducted sums shall not be deducted as a penalty but shall be considered as liquidation of a reasonable portion of damages that will be incurred by the Owner should the Contractor fail to complete the work in the time provided in contract documents.

Permitting the Contractor to continue and finish the work or any part of it after the time allowed for its completion, or after the date to which the time for completion may have been extended, will in no way operate as a waiver on the part of the Owner of any of its rights under the contract documents.

8. DEFAULT AND TERMINATION OF CONTRACT

The Contractor shall be considered in default of his/her contract and such default will be considered as cause for the Owner to terminate the contract for any of the following reasons if the Contractor:

- a. Fails to begin the work under the contract within the time specified in the "Notice to Proceed"; or
- b. Fails to perform the work or fails to provide sufficient workers, equipment or materials to assure completion of work in accordance with the terms of the contract; or
- c. Performs the work unsuitable or neglects or refuses to remove materials or to perform anew such work as may be rejected as unacceptable and unsuitable; or
- d. Discontinues the prosecution of the work; or
- e. Fails to resume work which has been discontinued within a reasonable time after notice do so; or
- f. Becomes insolvent or is declared bankrupt, or commits any act of bankruptcy or insolvency; or
- g. Allows any final judgment to stand against him/her unsatisfied for a period of 10 days; or
- h. Makes an assignment for the benefit of creditors; or
- i. For any other cause whatsoever, fails to carry on the work in an acceptable manner.

Should the Owner consider the Contractor in default of the contract for any reason hereinbefore, he shall immediately give written notice to the Contractor and the Contractor's Surety as to the reasons for considering the Contractor in default and the Owner's intentions to terminate the contract.

If the Contractor or Surety, within a period of 10 days after such notice, does not proceed in accordance therewith, then the Owner will, upon written notification from the Owner's Representative of the facts of such delay, neglect, or default and the Contractor's failure to

comply with such notice, have full power and authority to take the prosecution of the work out of the hands of the Contractor. The Owner may appropriate or sue any or all materials and equipment that have been mobilized for use in the work and are acceptable and may enter into an agreement for the completion of said contract according to the terms and revisions thereof, or use such other methods as in the opinion of the Owner's Representative will be required for the completion of said contract in an acceptable manner.

All costs and charges incurred by the Owner, together with the cost of completing the work under contract, will be deducted from any monies due or which may become due the Contractor. If such expense exceeds the sum which would have been payable under the contract, then the Contractor and the Surety shall be liable and shall pay to the Owner the amount of each excess.

9. TERMINATION FOR NATIONAL EMERGENCIES

The Owner shall terminate the contract or portion thereof by written notice when the Contractor is prevented from proceeding with the construction contract as a direct result of an Executive Order of the President with respect to the prosecution of war or in the interest of national defense.

When the contract, or any portion thereof, is terminated before completion of all items of work in the contract, payment will be made for the actual number of units or items of work completed at the contract price or as mutually agreed for items of work partially completed or not started. No claims or loss of anticipated profits shall be considered.

Reimbursement for organization of the work, and other overhead expenses, (when not otherwise included in the contract) and moving equipment and materials to and from the job will be considered, the intent being that an equitable settlement will be made with the Contractor.

Acceptable materials, obtained or ordered by the Contractor for the work and that are not incorporated in the work shall, at the option of the Contractor, be purchased from the Contractor at actual cost as shown by receipted bills and actual cost records as such points of delivery as may be designated by the Owner.

Termination of the contract or a portion thereof shall neither relieve the Contractor of his/her responsibilities for the completed work nor shall it relieve his/her Surety of its obligation for and concerning any just claim arising out of the work performed.

10. TERMINATION FOR CONVENIENCE

The Owner may whenever the interests of the Owner so require, terminate this Contract, in whole or in part, for the convenience of the Owner. The Owner shall give written notice of the termination to the Contractor specifying the extent of termination and the effective date of termination.

- a. The Contractor shall incur no further obligations in connection with the terminated work, and, on the date set in the notice of termination, the Contractor shall stop work to the extent specified. The Contractor shall also terminate outstanding orders and subcontracts as they relate to the terminated work. With approval or ratification of the Owner, the Contractor shall settle the liabilities and claims arising out of the termination of subcontracts and orders connected with the terminated work. The Owner may direct the Contractor to assign the Contractor's right, title, and interest under the terminated orders of subcontracts to the Owner. The Contractor must still complete the work not terminated by the notice of termination and may incur obligations as are necessary to do so.
- b. The Owner may require the Contractor to transfer title and deliver to the Owner in the manner and to the extent directed by the Owner: (I) the fabricated or unfabricated parts, work in process, completed work, supplies, and other material produced or acquired for the work terminated; and (ii) the completed or partially completed plans, drawings, information, and other property that, if the Contract had been completed, would be required to be furnished to the Owner. The Contractor shall, upon direction of the Owner, protect and preserve property in the possession of the Contractor in which the Owner has an interest. If the Owner does not exercise this right, the Contractor shall use its best efforts to sell such supplies and manufacturing materials. The proceeds of any transfer or disposition will be applied to reduce any payments to be made by the Owner, credited to the price or cost of the Work, or paid in any other manner directed by the Owner.
- c. After termination, the Contractor shall submit a final termination settlement proposal to the Owner in the form and with the certification prescribed by the Owner. The Contractor shall submit the proposal promptly, but no later than four (4) months from the effective date of termination, unless extended in writing by the Owner upon written request of the Contractor within this 1-year period. However, if the Owner determines that the facts justify it, a termination settlement proposal may be received and acted on after four (4) months or any extension. If the Contractor fails to submit the proposal within the time allowed, the Owner may determine, on the basis of information available, the amount, if any, due the Contractor because of the termination and shall pay the amount determined.
- d. Subject to paragraph © above, the Contractor and the Owner may agree upon the whole or any part of the amount to be paid because of the termination. The amount may include a reasonable allowance for profit on work done. However, the agreed amount, whethe.
- e. under this paragraph (d), or paragraph (f) below, exclusive of costs shown in subparagraph (e)(2) below, may not exceed the total Contract price as reduced by (1) the amount of payments previously made and (2) the contract price of work not terminated. The Contract shall be amended, and the Contractor paid the agreed amount.
- f. If the parties are unable to agree on the amount of a termination settlement, the Owner shall pay the Contractor the following amounts:
 - 1) For Contract Work performed before the effective date of termination, the total (without duplication of any item) of:

- i. the cost of this work;
- ii. the cost of settling and paying termination settlement proposals under terminated subcontracts that are properly chargeable to the terminated portion of the Contract if not included in subparagraph (I) above; and
- iii. a sum, as profit on (I), above, determined by the Owner to be fair and reasonable; however, if it appears that the Contractor would have sustained a loss on the entire Contract had it been completed, the Owner shall allow no profit under this subparagraph (iii), and shall reduce the settlement to reflect the indicated rate of loss.

2) The reasonable costs of settlement of the work terminated, including:

- i. accounting, legal, clerical, and other expenses reasonable necessary for the preparation of termination settlement proposals and supporting data;
- ii. the termination and settlement of subcontracts (excluding the amounts of such settlements); and
- iii. storage, transportation, and other costs incurred, reasonably necessary for the preservation, protection, or disposition of the termination inventory.

11. FULFILLMENT OF CONTRACT

The contract will be considered fulfilled when all the work has been completed, and the final inspection acceptance has been made. The Contractor will then be released from further obligation except as may be required by law, by his/her Surety, and by the general guarantee provided for herein by subsection entitled GENERAL GUARANTY of Section 00750.

END OF SECTION 00760

SECTION 00822

INSURANCE REQUIREMENTS

DESCRIPTION

1.1 INSURANCE

CONTRACTOR AGREEMENT

INDEMNIFICATION AND INSURANCE REQUIREMENTS:

In consideration of the utilization of Contractor's services by the City of Manchester and other valuable considerations, the receipt of which is hereby acknowledged, Contractor agrees that all persons furnished by Contractor shall be considered the Contractor's employees or agents and that Contractor shall be responsible for payment of all unemployment, social security and other payroll taxes including contributions from them when required by law.

CONTRACTOR hereby agrees to protect, defend, indemnify and hold the Owner, Authority, Architect/Engineer and Owner's Representative and their respective employees, agents, officers and servants free and harmless from any and all losses, claims, liens, demands and causes of action of every kind and character including but not limited to, the amounts of judgments, penalties, interests, court costs, legal fees and all other expenses incurred by the Owner, Authority, Architect/Engineer or Owner's Representative arising in favor of any party, including claims, liens, debts, personal injuries, including employees of the Owner, Authority, Architect/Engineer or Owner's Representative, death or damages to property (including property of the Owner, Authority, /Engineer or Owner's Representative) and without limitation by enumeration, all other claims or demands of every character occurring or in any way incident to, in connection with or arising or directly indirectly out of this Contractor Agreement. CONTRACTOR agrees to investigate, handle, respond to, provide defense for and defend any such claims, demands or suits at the sole handle, of the CONTRACTOR. CONTRACTOR also agrees to bear all other costs and expense related thereto, even if the claim or claims alleged are groundless, false or fraudulent. This provision is not intended to create any cause of action in favor of any third party against Contractor or the City or to enlarge in any way the CONTRACTOR'S liability but is intended solely to provide for indemnification of the City from liability for damages or injuries to third persons or property arising from CONTRACTOR'S performance hereunder.

CONTRACTOR agrees to maintain in full force and effect:

- a. General Liability insurance written on occurrence form, including completed operations coverage, personal injury liability coverage, broad form property damage liability coverage, and contractual liability coverage insuring the agreements contained herein. The minimum limits of liability carried on such insurance shall be \$2,000,000 each occurrence and, where applicable, in the aggregate combined single limit for bodily injury and property damage liability; \$5,000,000 annual aggregate personal injury liability.

- b. Automobile liability insurance for owned, non-owned and hired vehicles. The minimum limit of liability carried on such insurance shall be \$1,000,000 each accident, combined single limits for bodily injury and property damage.
- c. Excess Liability Coverage, or Umbrella Coverage, for Commercial General Liability and Automobile Liability shall be \$ 5,000,000.
- d. Workers' Compensation insurance whether or not required by the New Hampshire Revised Statutes Annotated, with statutory coverage and including employer's liability insurance.
- e. Employer's Liability coverage shall be Bodily Injury by Accident \$500,000 (each accident), Bodily Injury by Disease \$500,000 (policy limit), Bodily Injury by Disease \$500,000 (each employee).
- f. The Contractor will provide All-Risks Builder's Risk Insurance in an amount equal to 100% of the insurable value of the work, Completed Value Form including materials delivered and labor performed. This policy will be written in the name of the City of Manchester, Department of Aviation, the Contractor, Sub-Contractors, and Sub-subcontractors as their interests may appear. Such policy will also be endorsed so that loss, if any, shall be adjusted with and made payable to the Owner as Trustee for the insureds as their interests may appear; such insurance shall be specific as to coverage and not contributing insurance with any permanent insurance maintained as the present premises. The All-Risks insurance includes full flood and earthquake coverage. Materials stored off-site and materials in transit will be covered up to \$100,000 per occurrence.
- g. Any and all deductibles on the above described insurance policies shall be assumed by and be for the account of, and at the sole risk of Contractor.
- h. Insurance companies utilized must be admitted to do business in New Hampshire or be on the Insurance Commissioner's list of approved non-admitted companies and shall have a rating of (A) or better in the current edition of Best's Key Rating Guide.
- i. CONTRACTOR agrees to furnish certificate(s) of the above mentioned insurance to the City of Manchester, Department of Aviation within fourteen (14) days from the date of this agreement and, with respect to the renewals of the current insurance policies, at least thirty (30) days in advance of each renewal date. Such certificates shall, with respect to comprehensive general liability and auto liability insurance, name the City of Manchester, Department of Aviation, Manchester•Boston Regional Airport, and City of Manchester Department of Risk Management, and the A/E Firm , AECOM Technical Services, Inc. as an additional insured (except workers' compensation) and, with respect to all policies

shall state that in the event of cancellation or material change, written notice shall be given to the City of Manchester, Office of Risk Management, One City Hall Plaza, Manchester, New Hampshire 03101 at least thirty (30) days in advance of such cancellation or change.

- j. CONTRACTOR shall re-issue insurance certificates annually.
- k. The purchase of the insurance required or the furnishing of the aforesaid certificate shall not be a satisfaction of CONTRACTOR'S liability hereunder or in any way modify the CONTRACTOR'S indemnification responsibilities to the Owner, Authority or Owner's Representative.
- l. It shall be the responsibility of CONTRACTOR to ensure that all subcontractors comply with the same insurance requirements that he is required to meet.

SPECIAL HAZARDS

The Contractor's and Subcontractor's Public Liability, Property Damage, Vehicle Liability, and Vehicle Property Damage insurance coverage shall provide adequate protection against the following special hazards:

- a. Damage or injury to automobiles or persons in automobiles operating on or near the project site, resulting from any operations under this Contract.
- b. Damage or injury resulting from the use, storage, handling or transportation of materials in connection with the Contract work.

END OF SECTION 00822

SECTION 00826

CLEAN AIR AND WATER POLLUTION CONTROL REQUIREMENTS

DESCRIPTION

1. Clean Air and Water Pollution Control Requirements for All Construction Contracts and Subcontractors Bonding \$100,000.

Contractors and subcontractors agree:

- a. That any facility to be used in the performance of the contract or to benefit from the contract is not listed on the Environmental Protection Agency (EPA) List of Violating Facilities.
- b. To comply with all the requirements of Section 114 of the Clean Air Act and Section 308 of the Federal Water Pollution Control Act and all regulations issued thereunder.
- c. That as a condition for award of a contract he will notify the awarding official of the receipt of any communication from the EPA indicating that a facility to be utilized for performance of or benefit from the contract is under consideration to be listed on the EPA List of Violating Facilities.
- d. To include or cause to be included in any contract or subcontract which exceeds \$100,000 the aforementioned criteria and requirements.

END OF SECTION 00826

SECTION 00840

LIQUIDATED DAMAGES AND EXTENSIONS

DESCRIPTION

1.1 LIQUIDATED DAMAGES

- A. If the Contractor fails to substantially complete the Work for the overall project within the times specified in the Contract or any extension, at the sole discretion of the Owner, the Contractor shall pay the Owner, or the Owner will deduct payments due under this Contract or any other contract with the Owner, as liquidated damages, in the sum of Five Hundred Dollars (\$500.00) for each calendar DAY of delay, or proportional part thereof.
- B. If repairs work is assigned inside the Parking Garage Entrance or Exit Ramps (Helixes) or if the Contractor's construction access or operations for the work included in the Contract necessitates or causes a planned or unplanned closure of one of the Parking Garage Entrance or Exit Ramps, and the Contractor fails to open the Parking Garage Entrance or Exit to public access at the time specified in the Contract, or as pre-arranged with the Owner during the coordination of the work during the project, then the Contractor shall pay the Owner, or the Owner will deduct payments due under this Contract or any other contract with the Owner, as liquidated damages, in the sum of Five Hundred Dollars (\$500.00) for each HOUR of delay, or proportional part thereof.

1.2 UNAVOIDABLE DELAYS

- A. Time Extension
 - 1. The Contractor will be granted an extension of time for completion of the work beyond that named in the Contract Documents, for delays which may result through causes beyond the control of the Contractor and which he could not have avoided by the exercise of care, prudence, foresight and diligence.
 - 2. The Contractor shall be allowed extensions of time in which to complete the-work equal to the sum of all unavoidable delays plus any adjustments of contract time due to contract change orders. During such extension of time liquidated damages shall not be charged to the Contractor.
 - 3. Unavoidable delays within the meaning of this section shall be those caused by acts or neglect of the Owner, its employees, or those under it by contract or otherwise; by Acts of God (including weather or of the public enemy, fire, epidemics, or strikes). Material shortages and delays in utility company connections may be classified as an unavoidable delay if the Contractor can produce satisfactory evidence that he acted in a timely manner. There will be no damages for delays caused by Acts of God, public enemy, fire, epidemics, strikes, material shortages, and utility companies.
 - 4. Delays in the prosecution of parts of the work which may in themselves be unavoidable, but do not necessarily prevent or delay the prosecution of other parts of the work nor the

completion of the work within the time specified, which do not necessarily prevent the completion of the whole work within the time herein specified, will not be considered as unavoidable delays within the meaning of the contract.

B. Weather

The Contractor will not be allowed a time extension for weather delay when the contract is bid to be constructed during a period that will normally include inclement weather. The Contractor will only be allowed a time extension for unusually severe weather if it results in precipitation or other conditions which in the amount, frequency, or duration is in excess of the norm at the location and time of the year in question as established by NOAA weather data. A day for day extension will only be allowed for those days proven to be in excess of the norm.

If the weather is unusually severe (or conditions resulting therefrom) in excess of the NOAA data norm and prevents the Contractor from beginning at the usual starting time, or prevents the Contractor from proceeding with seventy-five percent (75%) of the normal labor and equipment force towards completion of the day's current controlling item on the accepted schedule for a period of at least five hours, and the crew is dismissed as a result thereof, the Owner will designate such time as unavoidable delay and grant one (1) calendar-day extension.

C. Notice

Whenever the Contractor foresees any delay in the prosecution of the controlling (critical path) work activity, and in any event immediately upon the occurrence of any delay which he regards as an unavoidable delay, the Contractor shall notify the Owner in writing of such delay and its cause, in order that the Owner may take immediate steps to prevent, if possible, the occurrence or continuance of the delay, and may determine whether the delay is to be considered avoidable or unavoidable, how long it continues, and to what extent the prosecution and completion of the work are to be delayed thereby.

After the completion of any part or the whole of the work, the Owner, in calculating the amount of time due the Contractor, will assume that any and all delays which have occurred have been avoidable delays, except such delays as shall have been called to the attention of the Owner at the time of their occurrence and found by the Owner to have been unavoidable as substantiated by a change order. The Contractor will make no claims that any delay not called to the attention of the Owner at the time of its occurrence has been an unavoidable delay.

D. Request for Time Extension.

In the event the Contractor requests an extension of contract time for unavoidable delay, or for changes, such justification shall be submitted no later than seven (7) days after the initial occurrence of any such delay. When requesting time for proposed change orders they must be submitted with the proposed change order with full justification. If the Contractor fails to submit justification with the proposed change order they will waive their right to a time

extension at a later date. Such justification must be based on the official contract schedule as updated at the time of occurrence of delay or execution of work related to any changes to the scope of work. The justification must include, but is not limited to, the following information:

- a. The duration to perform the activity relating to the changes in the work and the resources (manpower, equipment, material, etc.) required to perform these activities within the stated duration.
- b. Logical ties to the contract schedule for the proposed changes and/or delay showing the activity/activities in the schedule whose start or completion dates are affected by the change and/or delay.

The Owner, after receipt of such justification and supporting evidence, shall make its finding of fact. The Owner's decision shall be final and conclusive and the Owner will advise the Contractor in writing of such decision. If the Owner finds that the Contractor is entitled to any extension of contract time, the Owner's determination as to the total number of days of extension shall be based upon the latest updated version of the contract schedule. Such data will be included in the next monthly updating of the schedule.

END OF SECTION 00840

SECTION 00850

DISPUTES/CLAIMS

DESCRIPTION

1.1 GENERAL

"Dispute" or "Claim," as used in this section, means a written demand or written assertion by one of the contracting parties seeking, as a matter of right, the payment of money in a sum certain, the adjustment or interpretation of contract terms, or other relief arising under or relating to this contract. A claim arising under a contract, unlike a claim relating to that contract, is a claim that can be resolved under a contract clause that provides for the relief sought by that claimant. A voucher, invoice, or other routine request for payment that is not in dispute when submitted is not a claim or dispute under the contract. The submission may be converted to a claim under the contract, by complying with the submission requirements of this clause, if it is disputed either as to liability or amount.

Disputes under this agreement shall not be submitted to arbitration. Should any dispute arise respecting the true value of any work done, of any work omitted, or of any extra work which said Contractor may be required to do, or respecting the size of any payment to said Contractor during the performance of this contract, said dispute shall be decided by the Owner and the decision of the latter shall be final and conclusive.

A claim by the Contractor shall be made in writing and submitted to the Owner for a written decision. A claim by the Owner against the Contractor shall be provided to the Contractor in writing.

1.2 PROCEDURE

Contractor and Owner shall make good-faith attempts to resolve any and all claims/disputes that may from time to time arise during the performance of the work covered by this contract. If the Contractor considers any work demanded of him/her to be outside the requirements of the contract, or if he considers any instruction, meaning, requirement, ruling, or decision of the Owner or its representative to be unauthorized, he shall, within seven (7) calendar days after such demand is made, or instruction is given, file a written protest (dispute) with the Owner stating clearly and in detail his/her objections, and reasons therefore. The Contractor shall promptly comply with the work demanded of him/her even though a written protest has been filed. If a written protest is not issued within seven days, the Contractor shall waive his/her right to further claim on the specific issue.

The Owner, with consultation by the Owner's Representative, will review the Contractor's written protest (dispute) and recommend a resolution from which the Owner will make a decision. If, after receiving the decision, the Contractor still considers the work demanded of him/her to be outside the requirements of the contract, he shall so notify the Owner in writing within

seven days after receiving the decision that a formal claim will be submitted. Within thirty (30) days of receiving the decision the Contractor shall submit his/her claim and all arguments, justification, cost or estimates, CPM schedule analysis, and detailed documentation supporting his/her position. Failure to provide notification within (7) seven days and all justifying documentation within (30) thirty days will result in the Contractor waiving his/her right to the subject claim.

Upon receipt of the Contractor's formal claim including all arguments, justification, cost or estimates, CPM schedule analysis, and documentation supporting his/her position as outlined above, the Owner or his/her designer will review the issue and within thirty (30) days from receipt of the Contractor's claim render a final determination.

1.3 CERTIFICATION

The Contractor (and subcontractors) shall submit with the claim a certification that:

- a. The claim is made in good faith;
- b. Supporting data are accurate and complete to the best of the Contractor's knowledge and belief.
- c. The amount requested accurately reflects the contract adjustment for which the Contractor believes the Owner is liable.
- d. If the Contractor is an individual, the certification shall be executed by that individual.
- e. If the Contractor is not an individual, the certification shall be executed by an officer or general partner of the Contractor having overall responsibility for the conduct of the Contractor's affairs.

Failure to provide certification in accordance with paragraph 3(e) above will result in the Contractor waiving the right to the subject claim. If a false claim is submitted it will be considered fraud and the contractor may be subject to criminal prosecution.

1.1 CLAIMFORMAT

The Contractor will submit the claim justification in the following format:

- a. Summary of claim merit and quantum plus clause under which the claim is made.
- b. List of documents relating to claim:
 - 1) Specifications
 - 2) Drawings
 - 3) Clarifications INFORMATION NOTICES (IN) - REQUEST FOR INFORMATION (RFI).

- 4) CONSTRUCTION CHANGE DIRECTIVES (CCD)
 - 5) COST PROPOSAL (CP).
 - 6) Other
- c. Chronology of events and correspondence.
- d. Analysis of claim merit.
- e. Analysis of claim cost.
- f. Cover letter and certification.
- g. Attachments:
 - 1) Relevant Specifications
 - 2) Relevant Drawings
 - 3) Relevant Clarifications
 - 4) Relevant Correspondence
 - 5) Other

END OF SECTION 00850

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Manchester • Boston Regional Airport Project Documents

City of Manchester - Department of Aviation

Division 01: GENERAL CONDITIONS

**PARKING GARAGE: LEVEL-4 FLOOR & LEVEL-3 CEILING
SEALANTS, WATERPROOFING, & MISCELLANEOUS REPAIRS**

FY22-805-50



APRIL 2022

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SECTION 01100

SUMMARY

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Bid Forms and Contract Requirements and other Division 1 Specification Sections, apply to this Section.

1.2 WORK COVERED BY CONTRACT DOCUMENTS

- A. Project Identification: Manchester•Boston Regional Airport Parking Garage: Level-4 Floor & Level-3 Ceiling, Sealants, Waterproofing, & Miscellaneous Repairs FY22-805-50
 - 1. Project Location: Manchester•Boston Regional Airport, One Airport Road, Manchester, NH 03103
 - 2. Owner: City of Manchester, NH, Department of Aviation
- B. Engineer Identification: The Contract Documents were prepared for Project by AECOM Technical Services, Inc. (AECOM) , 1155 Elm Street, Manchester , NH 03101
- C. The **Parking Garage: Level-4 Floor & Level-3 Ceiling, Sealants, Waterproofing, & Miscellaneous Repairs Project** consists of a multi-phase repairs program for certain areas of the existing 4,800 space, six-level parking facility at Manchester•Boston Regional Airport, in Manchester, New Hampshire. The areas to receive the work will include the Level-4 deck and the Level-3 ceiling, and any other localized areas of the garage as may be designated by the Engineer during the progression of the overall work for the project.

The majority of the parking structure will remain fully open for use by garage patrons during the construction period, including Level-1, Level-2, Level-5, and Level-6. The Contractor will be required to perform his work in such a manner as to accommodate the continued operation of the facility.

The Level-4 floor repairs and the Level-3 ceiling repairs (underside of Level-4 deck) will require phasing as half of the garage floor at a time in a North/South manner as indicated in the Plans unless directed otherwise by the Engineer. The Owner will capture the work areas prior to the Contractor's mobilization date and the Owner will install traffic control devices including barrels and roping and directional signage to delineate areas that may be opened to public parking if deemed necessary by the Owner during the construction period. The Owner intends to keep both Levels fully closed if possible dependent on garage operational requirements and customer service considerations. The Contractor shall coordinate the work tasks accordingly and with the Engineer.

- The Deck Repairs will be performed throughout the entirety of Level-4 and essentially affecting 100% of the floor area.

The floor repairs will vary in location, type, size, and quantity, as shown on the Plans and directed by the Engineer depending on the existing conditions observed and will generally consist of, but is not limited to, all or some of the following work, some of which is subsidiary to other Work Items or the overall project:

- Removal and Replacement of sealants in precast concrete double-tee floor element joints and/or other joints or locations as directed by the Engineer.
 - Removal and disposal of existing concrete bollards on Level-3.
 - Removal of deteriorated precast and cast in place concrete.
 - Blast cleaning w/ abrasive media.
 - Epoxy coating of reinforcing steel .
 - Furnish and install replacement/supplementary reinforcing steel.
 - Installation of galvanic corrosion protection anodes.
 - Application of concrete patching mortar materials.
 - Repair of cracked concrete with pressure injection of epoxy resin.
 - Shot-blast cleaning of floor surfaces including pavement marking paint removal as directed by the Engineer.
 - Application of vehicular traffic bearing waterproofing membrane coatings and supplementary wearcoat on existing traffic coatings.
 - Application of penetrating concrete sealer with migrating corrosion inhibitor to concrete surfaces.
 - Furnish and install traffic delineator devices on Level-3.
 - Deck repairs at the north and south ends of the garage on Level-4 where circulating traffic drives across the column row bays near the ends of the parking garage which may be referred to as Drive Bays, where the ends of the precast concrete double tee floor elements are joined. The drive bay repairs consist of concrete sawcutting and removal of portions of the 2” thick cast in place concrete topping slab along the jointlines, forming and placing concrete patch material to create a cavity for installation of a heavy duty expanding fjoint material, installing the joint material, and application of traffic-bearing waterproofing coatings in the drive bay areas.
 - Other subsidiary work as required.
 - Other miscellaneous Field Item Allowance work as directed by the Engineer or Owner’s representative.
- The Ceiling Repairs will be performed along the column rows in the north/south direction where the ends of the precast concrete double tee floor elements are joined together. Ceiling repairs are planned for the Level-3 ceiling, and, if available funding, scheduling, operations, and work processes coordination allows, other potential additional areas in the garage, including localized areas of the Level-5 ceiling or other areas in the garage as may be captured by the Owner and designated

for selected ceiling repairs as directed by the Engineer.

The ceiling repairs will vary from area to area in type, size, and quantity, as directed by the Engineer depending on the existing conditions observed and will generally consist of, but is not limited to, all or some of the following work, some of which is subsidiary to other Work Items or the overall project:

- Removal of deteriorated concrete.
 - Blast cleaning w/ abrasive media.
 - Epoxy coating of reinforcing steel.
 - Installation of galvanic corrosion protection anodes.
 - Application of overhead and/or vertical concrete patching mortar materials.
 - Repair of cracked concrete with pressure injection of epoxy resin.
 - Application of penetrating corrosion inhibitor to concrete surfaces.
 - Installation of glass fiber reinforced polymer (GFRP) fabric wrap.
 - Other subsidiary work as required.
 - Other miscellaneous Field Item Allowance work as directed by the Engineer or Owner's representative.
- The Pedestrian Bridge Pier-B Grade Stairs & Ramp repairs will be performed in an area that cannot be closed to public access during regular business hours. The Contractor shall perform at least some of the work during overnight hours as described in the Technical Specifications. Work during normal business hours will require the Contractor to provide and erect barricades and/or other appropriate protection for nearby pedestrians. Some of the work to be performed in this area will be performed under the Unit Cost Contract Work Items and the remainder of the work and all incidental and temporary work shall be included in the Contractor's Lump Sum Bid Price for Item 9.1.

The repairs will vary in type, size, and quantity, as directed by the Engineer depending on the existing conditions and will generally consist of, but is not limited to, all or some of the following work, some of which is subsidiary to other Work Items or the overall project:

- Removal of existing troweled-on protective coating(s) from the concrete surfaces of the walls and stairway sides (overnight work if means and methods produce significant dust & noise disruptive to the general traveling public or other Airport operations).
 - Selective demolition of deteriorated concrete
 - Abrasive blasting of concrete surfaces receiving repairs and where the coatings were removed and traffic coatings are to be applied (overnight work).
 - Surface preparation and application of protective coatings to exposed existing reinforcing steel.
 - Installation of cathodic protection anodes
 - Forming and placement of horizontal concrete repairs
 - Vertical/overhead concrete patching

- Removal and installation of elastomeric cove sealants
- Installation of traffic coatings
- Other subsidiary work as required.
- Other miscellaneous Field Item Allowance work as directed by the Engineer or Owner's representative.

Only pre-qualified Contractors will be allowed to bid on this City of Manchester, NH, Department of Aviation contract for Level-4 Floor & Level-3 Ceiling, Sealants, Waterproofing, and Miscellaneous Repairs.

1.3 CONTRACT

- A. The Project will be constructed in accordance with the documents contained within the Project Plans and Specifications and/or as directed by the Engineer.

1.4 WORK SEQUENCE

- A. The Level-4 Floor Repairs and the Level-3 Ceiling Repairs shall commence at approximately the same time upon the Contractor's mobilization to the site and shall progress concurrently and continuously. It is anticipated that the ceiling repairs would be completed before the completion of all the floor repairs work. Coordination of work processes (demolition / patching / sealants & coatings applications, etc) between the floor repairs and ceiling repairs in overlapping locations will be necessary to ensure adequate undisturbed cure times for materials and overall integrity of the work.
- B. The Engineer will designate the Work Area Phase Sequence (North vs. South) during the pre-construction coordination after contract award.
- C. The Contractor shall commence work on the date indicated on the Notice to Proceed. Should the prosecution of the Work for any reason be discontinued, the Contractor shall notify the Engineer at least twenty-four (24) hours in advance of resuming operations.
- D. It is the purpose and intent of the Owner to complete the Work in the shortest time possible and for the work to be consistent with approved construction. To this end, Contractors will be required to use improved methods and equipment for doing the Work and various parts thereof. All equipment shall be complete and well designed, and the organization shall be efficient and effective.
- E. If, in the opinion of the Engineer and/or Owner, it is necessary at any time, the Contractor shall when directed, employ such forces and equipment for one or more additional shifts as will be required to insure the proper completion of the Work. The Contractor shall provide and maintain, including power and fuel, sufficient lights for the safety of his/her construction forces and to ensure the proper construction, inspection, and prosecution of the Work, in addition to any lights necessary to protect

the Work or the traveling public. The Contractor shall not receive any compensation therefore in addition to the Contract prices.

- F. The Owner may delay the commencement of the Work, or any part thereof, if the Owner shall deem it best for its interest to do so. The Contractor shall have no claim for damages on account of such delay, but shall be entitled to an equivalent extension of time in calendar days in which to complete the whole or any portion of the Work required under the Contract.

1.5 SCHEDULE

- A. It is essential that the Contractor performs fully, entirely, and in an acceptable manner the Work required within the time stated.

The Contract period has been carefully considered and has been established for reasons of importance to the Owner. This time limit for the duration of the work will be enforced and any prospective Bidder who is not willing to accept this Contract with the intention of complying with the time limit is cautioned not to submit a bid. No request for an extension of time that is based on any claim that the Contract period as originally established was inadequate will be considered.

1. All work on-site shall be performed within a 130 calendar day construction period from the contractor's start date stipulated in the written Notice to Proceed to be issued following the contract execution. The construction period shall take place within the following site availability dates:

Commencement of on-site operations: As soon as possible following Contract execution and Owner's NTP and on or before May 23, 2022.

Latest completion of work: September 30, 2022 or as extended at the discretion of the Owner to accomplish more ceiling repairs work.

- B. Grounds for Extension of Time. The time durations provided by this Contract for completion of the Work (or for completion of a designated part of the Work) shall be extended only if in the opinion of the Owner, the Contractor is necessarily delayed in completing the Work (or such designated part thereof) by such time solely and directly by a cause that meets the following conditions:

1. Such cause is beyond the Contractor's control and arises without his/her fault; and
2. Such cause comes into existence after the opening of proposals on the Contract and neither was nor could have been anticipated by investigation before such opening.

Variations in temperature and precipitation which are within normal limits for the particular month in question shall be conclusively deemed to have been anticipated

before the opening of proposals on this contract. Such normal limits shall be ascertained by reference to the official records of the United States Weather Bureau applicable to the particular locality for the previous three years.

1.6 USE OF PREMISES

- A. Contractor's use of premises will be limited to the areas as identified on the plans. The Contractor shall NOT store any tools or materials in walkways, the active stair towers, or the elevator structure. The Contractor shall limit operations and carry on work in such a manner and sequence as to insure the least possible interference with traffic and garage patrons and operations.
- B. The Contractor shall not prevent or impede the public use of the Entrance Helix or Exit Helix at any time outside of the specific times allowed in the Contract or as specifically approved by the Owner's Representative for the Contractor's work.

1.7 WORK UNDER OTHER CONTRACTS

- A. In the event Owner contracts other work on, or in the vicinity of the project, cooperate fully with separate Contractors so work on those contracts may be carried out smoothly, without interfering with, or delaying work under this or any other contract.

1.8 FUTURE WORK

- A. Future Contract: Owner may award separate contracts for additional work to be performed at or near the site after Substantial Completion.

1.9 SPECIFICATION FORMATS AND CONVENTIONS

- A. Specification Format: The Specifications are organized into Divisions and Sections using the 16-division format and CSI/CSC's "MasterFormat" numbering system.
 - 1. Section Identification: The Specifications use section numbers and titles to help cross-referencing in the Contract Documents. Sections in the Project Manual are in numeric sequence; however, the sequence is incomplete. Consult the table of contents at the beginning of the Project Manual to determine numbers and names of sections in the Contract Documents.
- B. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:

- 1. Abbreviated Language: Language used in the Specifications and other Contract

Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be inferred as the sense requires. Singular words shall be interpreted as plural, and plural words shall be interpreted as singular where applicable as the context of the Contract Documents indicates.

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

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

END OF SECTION 01100

SECTION 01140

WORK RESTRICTIONS

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Bid Forms and Contract Requirements and other Division 1 Specification Sections, apply to this Section.

1.2 USE OF PREMISES

- A. Use of Site: Limit use of premises to work in areas indicated. Do not disturb portions of site beyond areas in which the Work is indicated.
 - 1. Limit noise related activities to levels and hours allowed by City of Manchester Ordinances as well as Manchester•Boston Regional Airport Security Directives.
 - 2. Allow for continued operation of the Parking Garage and Rental Car Facilities, including unimpeded access to all areas outside the limits of construction.
 - 3. Driveways and Entrances: Keep driveways and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.
 - a. Schedule deliveries to minimize use of driveways and entrances.
 - b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.
- B. On-Site construction activities shall be conducted between the hours of 6 AM to 6 PM Mondays through Fridays except on State and Federal Holidays or as required to complete schedule sensitive work. Contractor shall receive written approval from the Owner prior to commencing with any work outside the time and days established above.
- C. Contractor's use of premises will be limited to the areas as designated on the Plans. The area on Level-4 and Level-3 will be closed to the general public for safety purposes as directed by the Owner due to the active work. Portions of those levels may be opened for public parking if deemed necessary by the Owner and as described on the phasing plans and related specifications including Work Item 1.1 in Specification Section 02000. The Contractor shall

NOT store any tools or materials in the stair towers or elevator lobby/stairwell structures. The elevators may NOT be used for transport of material, tools, or equipment between floors. The Contractor shall limit operations and carry on work in such a manner and sequence as to insure the least possible interference with traffic and garage patrons and operations.

- D. The Contractor shall not prevent or impede the public use of the Entrance Helix or Exit Helix at any time outside of the specific times allowed in the Contract for the Contractor's work, and the Contractor shall not store any tools or materials in the Entrance Helix or Exit Helix.
- E. The Contractor shall limit his operations and carry on work in such a manner and sequence as to insure the least possible interference with traffic and garage patrons and operations.

1.3 OCCUPANCY REQUIREMENTS

- A. Owner Occupancy: Owner will occupy the garage site to continue public parking and rental car activities on Level-1, Level-2, Level-5, and Level-6 and as specifically noted for supplemental parking use on the portion of Level-4 and/or Level-3 that is isolated from the contractor's phased operations, during the entire construction period. Perform the Work so as not to interfere with Owner's operations. The elevator lobbies and elevators, and stairway towers will remain open and available to the Owner and the general public for access to the garage and Airport Terminal. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

END OF SECTION 01140

SECTION 01250

CONTRACT MODIFICATION PROCEDURES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Bid Forms and Contract Requirements 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 include the following:
 - 1. Division 1 Section "Unit Prices" for administrative requirements for using unit prices.
 - 2. Division 1 Section "Product Requirements" for administrative procedures for handling requests for substitutions made after Contract award.

1.3 MINOR CHANGES IN THE WORK

- A. Engineer will issue supplemental instructions authorizing Minor Changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on AIA Document G710, "Engineer's Supplemental Instructions", or other formal directive documentation.

1.4 PROPOSAL REQUESTS

- A. Owner-Initiated Proposal Requests: Engineer will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
 - 1. Proposal Requests issued by Engineer are for information only. Do not consider them instructions either to stop work in progress or to execute the proposed change.
 - 2. Within 12 days after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.

- a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
 - b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 - c. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
- B. Contractor-Initiated Proposals: If latent or unforeseen conditions require modifications to the Contract, Contractor may propose changes by submitting a request for a change.
 1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
 2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
 3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 4. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
 5. Comply with requirements in Division 1 Section "Product Requirements" if the proposed change requires substitution of one product or system for product or system specified.
- C. Proposal Request Form: Use AIA Document G709 for Proposal Requests.
- D. Proposal Request Form: For Change Order Proposals, use forms provided by Owner. Sample copies are included at end of this Section.

1.5 CHANGE ORDER PROCEDURES

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

1.6 CONSTRUCTION CHANGE DIRECTIVE

- A. Construction Change Directive: Engineer may issue a Construction Change Directive on AIA Document G714. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
 - 1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.
- B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.
 - 1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

END OF SECTION 01250

SECTION 01270

UNIT PRICES

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Bid Forms and Contract Requirements and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for unit prices.
- B. Related Sections include the following:
 - 1. Division 1 Section “Contract Modification Procedures” for procedures for submitting and handling Change Orders.
 - 2. Division 1 Section “Quality Requirements” for general testing and inspecting requirements.

1.3 DEFINITIONS

- A. Unit price is an amount proposed by bidders, stated on the Bid Form, as a price per unit of measurement for materials, work items or services.
- B. Due to the ongoing nature of the deterioration and duration of the project, the quantities provided in the bid form are approximate quantities only. The quantities shall be used as a basis for the comparison of bids only. The Owner does not expressly or by implication agree with the actual quantities of the work and reserves the right to increase or decrease the amount of work that may be deemed necessary or expedient to the Owner. Where possible, accurate estimates have been provided for items of known and unchanging size, area or volume.

1.4 PROCEDURES

- A. Unit prices include all necessary material, plus cost for delivery, installation, insurance, applicable taxes, overhead, and profit.
- B. Measurement and Payment: Refer to individual Specification Sections for work that requires establishment of unit prices. Methods of measurement and payment for unit prices are specified in those Sections.
- C. Owner reserves the right to reject Contractor's measurement of work-in-place that involves use of established unit prices and to have this work measured, at Owner's expense, by an independent surveyor acceptable to Contractor.

- D. Compensation shall be made to the Contractor for each Work Order based on the approved Contract unit bid prices and the actual unit quantities of work performed as specifically directed by the Engineer. No compensation shall be made for unauthorized work performed by the Contractor.
- E. An increase or decrease in any quantity shall not be considered as cause for increase in the unit price, nor in the time allowed for the completion of the work.

The successful bidder will be determined based on the total Contract price as stated in the bid form.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

END OF SECTION 01270

SECTION 01280

ALLOWANCES

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Bid Forms and Contract Requirements and other Division 1 Specification Sections, apply to this Section.

1.2 DESCRIPTION

- A. All Allowances shall be included in the Base Bid and shall be carried by the Contractor.
- B. Allowance to be carried shall include:
 - a. Work Item 9.5 - Field Item Allowance – General
- C. The allowance for miscellaneous field items or other work under Work Item 9.5 shall be negotiated and agreed to between the Owner and the Contractor in advance of the work based on a written proposal from the Contractor. The work under Work Item 9.5 may be proposed as a Lump Sum Amount, Unit Cost, or Time & Material at the discretion of the Owner.
- D. The Contractor shall apply for payment under allowances in accordance with the requirements contained in the related Work Item Scope in Section 02000.
- E. Refer to related Drawings and Specifications for additional information regarding Work to be included as part of Allowances.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

END OF SECTION 01280

SECTION 01290

PAYMENT PROCEDURES

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Bid Forms and Contract Requirements 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 “Unit Prices”
 - 2. Division 1 Section “Contract Modification Procedures”
 - 3. Division 1 Section “Construction Progress Documentation”
 - 4. Division 1 Section “Allowances”

1.3 APPLICATIONS FOR PAYMENT

- A. Each Application for Payment shall be consistent with previous applications and payments as certified by Engineer and paid for by Owner.
 - 1. Initial Application for Payment and Final Application for Payment involve additional requirements.
- B. Payment Application Times: The due date for each progress payment is the 14th day of each month. The period covered by each Application for Payment shall be for the previous calendar month.
- C. Payment Application Forms: Use AIA Document G702 and AIA Document G703 Continuation Sheets as form for Applications for Payment.
 - 1. Each application shall include a summary of quantities spreadsheet (by period / pay application and cumulative total) and quantity installation plan worksheets (marked up PDF copies of the contract plans) indicating locations and measured quantities covered by the application.
- D. Application Preparation: Complete every entry on form. Submit a DRAFT / Pencil copy of the application with worksheets and backup as applicable to the Engineer for review. Following approval of the draft by the Engineer, 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 Contractor's Unit Price Bid Form.
 2. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
- E. Transmittal: Submit (3) three signed and notarized original copies of each Application for Payment to Engineer. 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 in previous application, after deduction for Retainage, on each item.
 2. When an application shows completion of an item, submit final or full waivers.
 3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
 4. Submit final Application for Payment with 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.
- G. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
1. List of subcontractors.
 2. List of Contractor's staff assignments.
 3. Permits.
 4. Certificates of insurance and insurance policies.
 5. Bonds.
- H. Final Payment Application: Submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:
1. Evidence of completion of Project closeout requirements.
 2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
 3. Updated final statement, accounting for final changes to the Contract Sum.
 4. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims."
 5. AIA Document G706A, "Contractor's Affidavit of Release of Liens."
 6. AIA Document G707, "Consent of Surety to Final Payment."

7. Evidence that claims have been settled.
8. Final meter readings for utilities, and similar data as of date when Owner took possession of and assumed responsibility for corresponding elements of the Work.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

END OF SECTION 01290

SECTION 01310

PROJECT MANAGEMENT AND COORDINATION

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Bid Forms and Contract Requirements and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

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

1. 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 1 Section "Summary of Work" for a description of the division of Work, Project Phasing, Work Orders, contracts and responsibility for coordination activities not in this Section.
2. Division 1 Section "Construction Progress Documentation" for preparing and submitting the Contractor's Construction Schedule.
3. Division 1 Section "Execution Requirements" for procedures for coordination and field-engineering services.
4. Division 1 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. Installation and removal of temporary facilities and controls.
 3. Delivery and processing of submittals.
 4. Weekly on-location construction progress meetings.
 5. Pre-installation conferences.
 6. Project closeout activities.
- D. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials.
1. Where possible, salvage materials and equipment involved in performance of, but not actually incorporated into, the Work.

1.4 SUBMITTALS

- A. Staff Names: At least five days prior to start of construction operations, submit a list of principal staff assignments, including Project Officer/Director, Project Manager, Superintendent, Site Foreman, and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including cellular and office telephone numbers for Project Manager and Superintendent. This list must be updated when staff assignments change.

1.5 PROJECT MEETINGS

- A. General: Schedule and conduct meetings and conferences.
1. Attendees: 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: Prepare the meeting agenda. Distribute the agenda to all invited attendees.

3. Coordinate time and location with Owner. Owner will make available meeting rooms convenient to the site for project meetings.
4. Minutes: Record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Engineer, within 3 business days of the meeting.

B. Preconstruction Conference: Schedule a preconstruction conference before starting construction, at a time convenient to Owner and Engineer. The Owner shall provide a convenient location to hold conferences.

1. Attendees: Authorized representatives of Owner, 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 (if any)
 - c. Work area capture status.
 - d. Critical work sequencing.
 - e. Designation of responsible personnel.
 - f. Procedures for processing field decisions and Change Orders.
 - g. Procedures for processing Applications for Payment.
 - h. Distribution of the Contract Documents.
 - i. Submittal procedures.
 - j. Preparation of Record Documents.
 - k. Use of the premises.
 - l. Responsibility for temporary facilities and controls.
 - m. Dust control and patron claims.
 - n. Parking availability.
 - o. Work and storage areas.
 - p. Equipment deliveries and priorities.
 - q. Safety incidents / First aid.
 - r. Security.
 - s. Progress cleaning.
 - t. Working hours.
 - u. Testing requirements.
 - v. Phase completion.

C. Progress Meetings: Conduct progress meetings weekly or at other appropriate regular intervals as directed by the Engineer. Coordinate dates of meetings with preparation of payment requests when possible.

1. Attendees: In addition to representatives of Owner, Engineer, 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 the 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: Contractor shall submit an updated Gant Chart schedule before each meeting. 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) Sequence of operations.
 - 2) Status of submittals.
 - 3) Deliveries.
 - 4) Off-site fabrication.
 - 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: 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.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

END OF SECTION 01310

SECTION 01320

CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Bid Forms and Contract Requirements and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
 - 1. Contractor's Construction Schedule.
 - 2. Daily construction reports.
 - 3. Material location reports.
 - 4. Field condition reports.
 - 5. Special reports.
 - 6. Construction photographs.
- B. Related Sections include the following:
 - 1. Division 1 Section "Payment Procedures" for submitting the Schedule of Values.
 - 2. Division 1 Section "Project Management and Coordination" for submitting and distributing meeting and conference minutes.
 - 3. Division 1 Section "Submittal Procedures" for submitting schedules and reports.
 - 4. Division 1 Section "Photographic Documentation" for submitting construction photographs.
 - 5. Division 1 Section "Quality Requirements" for submitting a schedule of tests and inspections.
 - 6. Division 1 Section "Closeout Procedures" for submitting photographic negatives as Project Record Documents at Project closeout.

1.3 DEFINITIONS

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

1. Critical activities are activities on the critical path. They must start and finish on the planned early start and finish times.
 2. Predecessor activity is an activity that must be completed before a given activity can be started.
- B. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of Project.
- C. Critical Path: The longest continuous chain of activities through the network schedule that establishes the minimum overall Project duration and contains no float.
- D. Event: The starting or ending point of an activity.
- E. Float: The measure of leeway in starting and completing an activity.
1. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the following activity.
 2. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.
- F. Fragnet: A partial or fragmentary network that breaks down activities into smaller activities for greater detail.
- G. Major Area: A story of construction, a separate building, or a similar significant construction element.
- H. Milestone: A key or critical point in time for reference or measurement.
- I. Network Diagram: A graphic diagram of a network schedule, showing activities and activity relationships.

1.4 SUBMITTALS

- A. Contractor's Construction Schedule: Upon receipt of a Construction Work Order and prior to commencement of phase work, submit 3 printed copies of initial schedule, large enough to show schedule for entire construction phase period.
- B. Construction Photographs: Submit one print of each photographic view within seven days of taking photographs in accordance with Section 01322 "Photographic Documentation".

- C. Daily Construction Reports: Submit one copy at monthly intervals.
- D. Special Reports: Submit two copies at time of unusual event.

1.5 COORDINATION

- A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors.
- B. Coordinate Contractor's Construction Schedule with subcontracts, Submittals Schedule, progress reports, payment requests, and other required schedules and reports.

PART 2 PRODUCTS

2.1 SUBMITTALS SCHEDULE

- A. Preparation: Upon Engineer's request, submit a schedule of submittal dates.
 - 1. Coordinate Submittals Schedule with list of subcontracts and Contractor's Construction Schedule.
 - a. At Contractor's option, show submittals on the Preliminary Construction Schedule, instead of tabulating them separately.

2.2 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

- A. Time Frame: Extend schedule from date established for the Notice of Award to date of Final Completion.
- B. 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 (if any)
 - 2. Work under More Than One Contract: Include a separate activity for each contract (if any)
 - 3. Work by Owner: Include a separate activity for each portion of the Work performed by Owner (if any).
 - 4. Products Ordered in Advance: Include a separate activity for each product. Include delivery date indicated as the earliest possible delivery date.
 - 5. Work Restrictions: Show the effect of the following items on the schedule:

- a. Limitations of continued occupancies.
 - b. Uninterruptible services.
 - c. Use of premises restrictions.
 - d. Seasonal variations.
 - e. Environmental control.
- 6. Work Stages: Indicate important stages of construction for each major portion of the Work, including, but not limited to, the following:
 - a. Submittals.
 - b. Purchases.
 - c. Mockups.
 - d. Fabrication.
 - e. Sample testing.
 - f. Deliveries.
 - g. Installation.
 - h. Tests and inspections.
 - i. Adjusting.
 - j. Curing.
 - k. Startup and placement into final use and operation.
- 7. 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. Permanent space enclosure.
 - c. Completion of mechanical installation.
 - d. Completion of electrical installation.
 - e. Substantial Completion.
- C. Milestones: Include milestones in schedule, including, but not limited to, the Notice to Proceed, capturing, membrane applications, concrete repair, traffic calming work, and Final Completion.
- D. Contract Modifications: For each proposed contract modification and concurrent with its submission, demonstrate the effect of the proposed change on the project phase schedule and where applicable, the overall project schedule.
- E. Computer Software: Prepare schedules using a program that has been developed specifically to manage construction schedules.

2.3 PRELIMINARY CONSTRUCTION SCHEDULE

- A. Bar-Chart Schedule: Submit preliminary horizontal bar-chart-type construction schedule for all project phases within 7 days of the initial Notice of Award.
- B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line. Include

skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.

2.4 CONTRACTOR'S CONSTRUCTION SCHEDULE (GANTT CHART)

- A. Gantt-Chart Schedule: Submit a comprehensive, fully developed, horizontal Gantt-chart- type, Contractor's Construction Schedule within two weeks of the Notice to Proceed for each phase. Base schedule on the Preliminary Construction Schedule and whatever updating and feedback was received since the start of Project.
- B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line.
 - 1. For construction activities that require 3 months or longer to complete, indicate an estimated completion percentage in percentage increments within time bar.

2.5 REPORTS

- A. Daily Construction Reports: Prepare a daily construction report recording the following applicable information concerning events at Project site:
 - 1. List of subcontractors at Project site.
 - 2. Approximate count of personnel at Project site.
 - 3. High and low temperatures and general weather conditions.
 - 4. Accidents.
 - 5. Meetings and significant decisions.
 - 6. Unusual events (refer to special reports).
 - 7. Stoppages, delays, shortages, and losses.
 - 8. Meter readings and similar recordings.
 - 9. Emergency procedures.
 - 10. Orders and requests of authorities having jurisdiction.
 - 11. Change Orders received and implemented.
 - 12. Construction Change Directives received.
 - 13. Services connected and disconnected.
 - 14. Equipment or system tests and startups.
 - 15. Partial Completions and occupancies.
 - 16. Substantial Completions authorized.
 - 17. Location, type, and approximate quantities of work completed.

Furnish copies of daily reports to the Engineer or Owner upon request.

- B. 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, include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

2.6 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: Update schedule to reflect actual construction progress and activities and issue schedule prior to or at 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. 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. Photographer: Engage a qualified and experienced person to take digital construction photographs in accordance with Section 01322 “Photographic Documentation”.

END OF SECTION 01320

SECTION 01322

PHOTOGRAPHIC DOCUMENTATION

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Bid Forms and Contract Requirements and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for the following:
 - 1. Preconstruction photographs.
 - 2. Periodic construction photographs.
 - 3. Final Completion construction photographs.
- B. Related Sections include the following:
 - 1. Division 1 Section "Submittal Procedures" for submitting construction photographs.
 - 2. Division 1 Section "Closeout Procedures" for submitting photographic negatives as Project Record Documents at Project closeout.

1.3 SUBMITTALS

- A. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. If requested by the Owner, include lists of completed projects with project names and addresses, names and addresses of engineers and owners, and other information specified.
- B. Key Plan: Submit key plan of Project site and building with notation of vantage points marked for location and direction for photographs which cannot be visually orientated. Include the same label information as the corresponding set of photographs.
- C. Construction Photographs: Submit one set of digital image files (.jpg) on a CD or electronic file transfer with within seven days of substantial completion.
 - 1. Format: .JPG electronic file with medium to high resolution.
 - 2. Identification: photograph file naming shall include:

- a. Name of Project (abbreviated)
- b. Name of Contractor (abbreviated)
- c. Date photograph was taken.
- d. Description of vantage point, indicating location, direction (by compass point), and elevation or story of construction.

1.4 QUALITY ASSURANCE

- A. Photographer Qualifications: Contractor shall be responsible for establishing an acceptable level of quality, recording, logging, labeling and submitting photos OR if photographic quality is deemed inadequate at Engineer's direction, employ an individual of established reputation who has been regularly engaged as a professional photographer for not less than three years.

1.5 EXTRA PRINTS

- A. Extra Prints: If requested by Engineer, Contractor shall prepare an extra CD of photograph electronic files.

PART 2 PRODUCTS

2.1 PHOTOGRAPHIC MEDIA

- A. Digital Images: Provide images in JPEG format, with minimum sensor size of 5 megapixels.

PART 3 EXECUTION

3.1 PHOTOGRAPHS, GENERAL

- A. Photographer: The Contractor shall engage qualified and experienced personnel to take construction photographs. Refer to "Quality Assurance" requirements identified in this Section.
- B. Retain one set of prints of progress photographs at Project site, available at all times for reference. Identify photographs the same as for those submitted to Engineer.

3.2 CONSTRUCTION PHOTOGRAPHS

- A. Preconstruction Photographs: Before starting construction, take color photographs of Project site and surrounding properties from different vantage points to show existing conditions adjacent to or adjoining the property to accurately record the physical conditions at the start of construction.

- B. Periodic Construction Photographs: Take weekly, or interim daily as work type necessitates, color photographs to best show status of construction and progress since the last photographs were taken.
- C. From time to time, Engineer will instruct Contractor/photographer about number and frequency of color photographs and general directions on vantage points. Photographer shall select actual vantage points and take photographs to best show the status of construction and progress since the last photographs were taken.
- D. Time-Lapse Sequence Construction Photographs: Take photographs on a weekly basis from same Vantage Point, to best show status of construction and progress since the last photographs were taken.
- E. Final Completion Construction Photographs: Take color photographs after date of Substantial Completion for submission as Project Record Documents.
- F. In emergency situations, photographer shall take additional photographs within 24 hours of request.
- G. Circumstances that could require additional photographs include, but are not limited to, the following:
 - 1. Special events planned at Project site.
 - 2. Immediate follow-up when on-site events result in construction damage or losses.
 - 3. Photographs to be taken at fabrication locations away from Project site. These photographs are not subject to unit prices or unit-cost allowances.
 - 4. Substantial Completion of a major phase or component of the Work.
 - 5. Extra record photographs at time of final acceptance.
 - 6. Owner's request for special publicity photographs.

END OF SECTION 01322

SECTION 01330

SUBMITTAL PROCEDURES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Bid Forms and Contract Requirements and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other miscellaneous submittals.
- B. Related Sections include the following:
 - 1. Division 1 Section "Payment Procedures" for submitting Applications for Payment.
 - 2. Division 1 Section "Project Management and Coordination" for submitting Coordination Drawings.
 - 3. Division 1 Section "Construction Progress Documentation" for submitting schedules and reports, including Contractor's Construction Schedule and the Submittals Schedule.
 - 4. Division 1 Section "Photographic Documentation" for submitting periodic construction photographs.
 - 5. Division 1 Section "Quality Requirements" for submitting test and inspection reports and Delegated-Design Submittals and for erecting mockups.
 - 6. Division 1 Section "Closeout Procedures" for submitting warranties Project Record Documents and operation and maintenance manuals.
 - 7. Division 1 Section "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.
 - 8. Division 2 Technical Specifications

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. General: Electronic copies of CAD Drawings of the Contract Drawings will not be provided for Contractor's use in preparing submittals.
- B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
 - 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 - 2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
 - a. 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 1 Section "Construction Progress Documentation" for list of submittals and time requirements for scheduled performance of related construction activities.
- D. Processing Time: Allow enough time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Engineer's receipt of submittal.
 - 1. Initial Review: Allow 5 days from the date of delivery to the Engineer for initial review of each submittal. Allow additional time if processing must be delayed to permit coordination with subsequent submittals. Contractor will be advised when a submittal being processed must be delayed for coordination.
 - 2. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing.

- 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 of Contractor.
 - d. Name of subcontractor.
 - e. Name 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. 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.
- G. 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. On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Engineer on previous submittals, and deviations from requirements of the Contract Documents, including minor variations and limitations. Include the same label information as the related submittal.
 2. Include Contractor's certification stating that information submitted complies with requirements of the Contract Documents.

3. Transmittal Form: Use AIA Document G810 format.
4. 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.
- H. 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.
- I. 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.
 1. Number of Copies: 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. Number of Copies: Submit copies of each submittal, as follows, unless otherwise indicated:
 - a. Initial Submittal: Submit a preliminary single copy of each submittal where selection of options, color, pattern, texture, or similar characteristics is required. Engineer will return submittal with options selected.
 - b. Final Submittal: Submit three copies, unless copies are required for operation and maintenance manuals. Submit five

copies where copies are required for operation and maintenance manuals. Engineer will retain two copies; remainder will be returned. Mark up and retain one returned copy as a Project Record Document.

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

1. If information must be specially prepared for submittal because standard printed data are not suitable for use, submit as Shop Drawings, not as Product Data.
2. Mark each copy of each submittal to show which products and options are applicable.
3. Include the following information, as applicable:
 - a. Manufacturer's written recommendations.
 - b. Manufacturer's product specifications.
 - c. Manufacturer's installation instructions.
 - d. Standard color charts.
 - e. Manufacturer's catalog cuts.
 - f. Wiring diagrams showing factory-installed wiring.
 - g. Printed performance curves.
 - h. Operational range diagrams.
 - i. Mill reports.
 - j. Standard product operating and maintenance manuals.
 - k. Compliance with recognized trade association standards.
 - l. Compliance with recognized testing agency standards.
 - m. Application of testing agency labels and seals.
 - n. Notation of coordination requirements.

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

1. Preparation: Include the following information, as applicable:
 - a. Dimensions.
 - b. Identification of products.
 - c. Fabrication and installation drawings.
 - d. Roughing-in and setting diagrams.
 - e. Wiring diagrams showing field-installed wiring, including power, signal, and control wiring.
 - f. Shop work manufacturing instructions.
 - g. Templates and patterns.
 - h. Schedules.

- i. Design calculations.
 - j. Compliance with specified standards.
 - k. Notation of coordination requirements.
 - l. Notation of dimensions established by field measurement.
 2. Wiring Diagrams: Differentiate between manufacturer-installed and field- installed wiring.
 3. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches but no larger than 24 by 36 inches.
 4. Number of Copies: Electronic PDF files of submittals shall be submitted by email. If hardcopy submittals are requested at the discretion of the Engineer then, at no additional cost, submit three black-line prints of each submittal. Engineer will return one print unless prints are required for operation and maintenance manuals.
- D. Coordination Drawings: Comply with requirements in Division 1 Section "Project Management and Coordination."
- E. Samples: Prepare physical units of materials or products if requested by the Engineer or Owner, at no additional cost, including the following:
1. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
 2. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from the same material to be used for the Work, cured and finished in manner specified, and physically identical with the product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
 3. 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.
- 4. Additional Information: On an attached separate sheet, prepared on Contractor's letterhead, provide the following:
 - a. Size limitations.
 - b. Compliance with recognized standards.
 - c. Availability.
 - d. Delivery time.
- 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: Unless indicated otherwise, submit two full sets of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Engineer may return samples with options selected or notify Contractor of selection.
- 7. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
- F. Contractor's Construction Schedule: Comply with requirements in Division 1 Section "Construction Progress Documentation".
- G. Submittals Schedule: Comply with requirements in Division 1 Section "Construction Progress Documentation."
- H. Application for Payment: Comply with requirements in Division 1 Section "Payment Procedures."
- I. Subcontract List: Prepare a written summary identifying individuals or firms

proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:

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

2.2 INFORMATIONAL SUBMITTALS

- A. General: Prepare and submit Informational Submittals required by other Specification Sections.
 1. Number of Copies: Submit three copies of each submittal, unless otherwise indicated.
 2. Certificates and Certifications: Provide a notarized statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
 3. Test and Inspection Reports: Comply with requirements in Division 1 Section "Quality Requirements."
- B. Contractor's Construction Schedule: Comply with requirements in Division 1 Section "Construction Progress Documentation."
- C. 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.
- D. Product Certificates: Prepare written statements on manufacturer's letterhead certifying that product complies with requirements.
- E. 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.
- F. Installer Certificates: Prepare written statements on manufacturer's letterhead certifying that Installer complies with requirements and, where required, is unauthorized installer for the product and this specific Project.

- G. Manufacturer Certificates: Prepare written statements on manufacturer's letterhead certifying that manufacturer complies with requirements. Include evidence of manufacturing experience where required.
- H. Material Certificates: Prepare written statements on manufacturer's letterhead certifying that material complies with requirements.
- I. Material Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements.
- J. Preconstruction Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements.
- K. Compatibility Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.
- L. Field Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements.
- J. Product Test Reports: Prepare written reports indicating current product produced by manufacturer complies with requirements. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
- K. Research/Evaluation Reports: Prepare written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:
 - 1. Name of evaluation organization.
 - 2. Date of evaluation.
 - 3. Time period when report is in effect.
 - 4. Product and manufacturers' names.
 - 5. Description of product.
 - 6. Test procedures and results.
 - 7. Limitations of use.

- L. Maintenance Data: Prepare written and graphic instructions and procedures for operation and normal maintenance of products and equipment. Comply with requirements in Division 1 Section "Closeout Procedures."
- M. 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.
- N. Manufacturer's Field Reports: Where required prepare written information documenting factory-authorized service representative's tests and inspections. Include the following, as applicable:
1. Name, address, and telephone number of factory-authorized service representative making report.
 2. Statement on condition of substrates and their acceptability for installation of product.
 3. Statement that products at Project site comply with requirements.
 4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
 5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
 6. Statement whether conditions, products, and installation will affect warranty.
 7. Other required items indicated in individual Specification Sections.
- O. 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.
- P. Construction Photographs: Comply with requirements in Division 1 Section "Photographic Documentation."
- Q. Material Safety Data Sheets: Submit information directly to Owner with cc to the Engineer. If submitted to Engineer, Engineer will not review this information but will return it with no action taken.

PART 3 EXECUTION

3.1 CONTRACTOR'S REVIEW

- A. Review each submittal and check for compliance with the Contract Documents. Note corrections and field dimensions. 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.

3.2 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 will review each submittal, make marks to indicate corrections or modifications required, and return it. Engineer will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action taken, as follows:
 - 1. Reviewed for general consistency with plans and specifications.
 - 2. Reviewed for general consistency, comments noted.
 - 3. Revise and Resubmit
- 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.
- D. Submittals not required by the Contract Documents will not be reviewed and may be discarded.

END OF SECTION 01330

SECTION 01400

QUALITY REQUIREMENTS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Bid Forms and Contract Requirements and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
 - 1. Specific quality-control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
 - 2. Specified tests, inspections, and related actions do not limit Contractor's quality-control procedures that facilitate compliance with the Contract Document requirements.
 - 3. Requirements for Contractor to provide quality-control services are not limited by provisions of this Section.
- C. Related Sections include the following:
 - 1. Division 1 Section "Construction Progress Documentation" for developing a schedule of required tests and inspections.
 - 2. Division 1 Section "Cutting and Patching" for repair and restoration of construction disturbed by testing and inspecting activities.
 - 3. Divisions 2 through 16 Sections for specific test and inspection requirements.

1.3 DEFINITIONS

- A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and ensure that proposed construction complies with requirements.
- B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that completed construction complies with requirements. Services do not include contract enforcement activities performed by Engineer.
- C. Mockups: Full-size, physical example assemblies to illustrate finishes and materials. Mockups are used to verify selections made under Sample submittals, to demonstrate aesthetic effects and, where indicated, qualities of materials and execution, and to review construction, coordination, testing, or operation; they are not Samples. Mockups establish the standard by which the Work will be evaluated.
- D. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.

1.4 PERFORMANCE DESIGN

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

1.5 SUBMITTALS

- A. Performance-Design Submittal: In addition to Shop Drawings, Product Data, and other required submittals, submit a statement, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed by a design professional, indicating that the products and systems are in compliance with performance and design criteria indicated. Include list of codes, loads, and other factors used in performing these services.
- B. Schedule of Tests and Inspections: Prepare in tabular form and include the following:
 - 1. Specification Section number and title.
 - 2. Description of test and inspection.
 - 3. Identification of applicable standards.
 - 4. Identification of test and inspection methods.
 - 5. Number of tests and inspections required.

6. Time schedule or time span for tests and inspections.
7. Entity responsible for performing tests and inspections.
8. Requirements for obtaining samples.
9. Unique characteristics of each quality-control service.

C. Reports: Prepare and submit certified written reports that include the following:

1. Date of issue.
2. Project title and number.
3. Name, address, and telephone number of testing agency.
4. Dates and locations of samples and tests or inspections.
5. Names of individuals making tests and inspections.
6. Description of the Work and test and inspection method.
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. Ambient conditions at time of sample taking and testing and inspecting.
11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
12. Name and signature of laboratory inspector.
13. Recommendations on retesting and re-inspecting.

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

1.6 QUALITY ASSURANCE

- A. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- B. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- C. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

- D. **Manufacturer Qualifications:** A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance.
- E. **Professional Engineer Qualifications:** A professional engineer who is legally qualified and registered to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or products that are similar to those indicated for this Project in material, design, and extent.
- F. **Specialists:** Certain sections of the Specifications require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.
 - 1. Requirement for specialists shall not supersede building codes and similar regulations governing the Work, nor interfere with local trade-union jurisdictional settlements and similar conventions.
- G. **Mockups:** Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:
 - 1. Build mockups in location and of size indicated or, if not indicated, as directed by Engineer.
 - 2. Notify Engineer seven days in advance of dates and times when mockups will be constructed.
 - 3. Demonstrate the proposed range of aesthetic effects and workmanship.
 - 4. Obtain Engineer's approval of mockups before starting work, fabrication, or construction.
 - 5. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
 - 6. Demolish and remove mockups when directed, unless otherwise indicated.

1.7 QUALITY CONTROL

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

1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of the types of testing and inspecting they are engaged to perform.
 2. Payment for these services will be made by Owner directly to testing agency.
 3. Costs for retesting and re-inspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted to reflect the changes.
- B. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing.
- C. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
1. Access to the Work.
 2. Incidental labor and facilities necessary to facilitate tests and inspections.
 3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
 4. Facilities for storage and field curing of test samples.
 5. Preliminary design mix proposed for use for material mixes that require control by testing agency.
 6. Security and protection for samples and for testing and inspecting equipment at Project site.
- D. Coordination: Coordinate sequence of activities to accommodate required quality assurance and quality control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
1. Schedule times for tests, inspections, obtaining samples, and similar activities.
- E. Schedule of Tests and Inspections: Contractor shall notify testing agency and Engineer no less than 48 hours in advance of required testing, sampling, required inspections and similar quality-control services required by the Contract Documents. In the event cancellation of any testing, sampling, inspection services is required, the Contractor shall provide no less than 24 hours notice of cancellation to testing agency and Engineer. Failure to do so

SECTION 01420

REFERENCES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Bid Forms and Contract Requirements and other Division 1 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": Operations at Project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.
- H. "Provide": Furnish and install, complete and ready for the intended use.
- I. "Installer": Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular

construction operation, including installation, erection, application, and similar operations.

1. Using a term such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to trades people of the corresponding generic name.
- J. "Experienced": When used with an entity, "experienced" means having successfully completed a minimum of five previous projects similar in size and scope to this Project; being familiar with special requirements indicated, and having complied with requirements of authorities having jurisdiction.
- K. "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. Conflicting Requirements: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to Engineer for a decision before proceeding.
 1. 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.
- D. Copies of Standards: Each entity engaged in construction on Project must be familiar with industry standards applicable to its construction activity. Copies

of applicable standards are not bound with the Contract Documents.

2. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source and make them available on request.

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

ADAAG	Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities Available from Access Board www.access-board.gov	(800)872-2253 (202)272-5434
CFR	Code of Federal Regulations Available from Government Printing Office www.access.gpo.gov/nara/cfr	(888) 293-6498 (202) 512-1530
CRD	Handbook for Concrete and Cement Available from Army Corps of Engineers Waterways Experiment Station www.wes.army.mil	(601) 634-2355
DOD	Department of Defense Specifications and Standards Available from Defense Automated Printing Service www.astimage.daps.dla.mil/online	(215) 697-6257
FED-STD	Federal Standard (See FS)	
FS	Federal Specification Available from Defense Automated Printing Service www.astimage.daps.dla.mil/online	(215) 697-6257
	Available from General Services Administration www.fss.gsa.gov/pub/fed-specs.cfm	(202) 619-8925
	Available from National Institute of Building Sciences www.nibs.org	(202) 289-7800
FTMS	Federal Test Method Standard (See FS)	

MILSPEC	Military Specification and Standards Available from Defense Automated Printing Service www.astimage.daps.dla.mil/online	(215) 697-6257
UFAS	Uniform Federal Accessibility Standards Available from Access Board www.access-board.gov	(800) 872-2253 (202) 272-5434

1.4 ABBREVIATIONS AND ACRONYMS

- A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in Gale Research's "Encyclopedia of Associations" or in Columbia Books' "National Trade & Professional Associations of the U.S."
- B. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web-site addresses are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

AA	Aluminum Association, Inc. (The) www.aluminum.org	(202)862-5100
AAADM	American Association of Automatic Door Manufacturers www.aaadm.com	(216) 241-7333
AABC	Associated Air Balance Council www.aabchq.com	(202) 737-0202
AAMA	American Architectural Manufacturers Association www.aamanet.org	(847) 303-5664
AAN	American Association of Nurserymen (See ANLA)	
AASHTO	American Association of State Highway and Transportation Officials www.aashto.org	(202) 624-5800
AATCC	American Association of Textile Chemists and Colorists (The) www.aatcc.org	(919) 549-8141
ABMA	American Bearing Manufacturers Association www.abma-dc.org	(202) 367-1155

ACI	American Concrete Institute/ACI International www.aci-int.org	(248) 848-3700
ACPA	American Concrete Pipe Association www.concrete-pipe.org	(972) 506-7216
AEIC	Association of Edison Illuminating Companies, Inc. (The) www.aeic.org	(205) 257-2530
AFPA	American Forest & Paper Association (See AF&PA)	
AF&PA	American Forest & Paper Association www.afandpa.org	(800) 878-8878 (202) 463-2700
AGA	American Gas Association www.aga.org	(202) 824-7000
AGC	Associated General Contractors of America (The) www.agc.org	(703) 548-3118
AHA	American Hardboard Association www.hardboard.org	(847) 934-8800
AHAM	Association of Home Appliance Manufacturers www.aham.org	(202) 872-5955
AI	Asphalt Institute www.asphaltinstitute.org	(859) 288-4960
AIA	American Institute of Architects (The)	(800) 242-3837
	www.aia.org	(202) 626-7300
AISC	American Institute of Steel Construction	(800) 644-2400
	www.aisc.org	(312) 670-2400
AISI	American Iron and Steel Institute www.steel.org	(202) 452-7100
AITC	American Institute of Timber Construction www.aitc-glulam.org	(303) 792-9559
ALCA	Associated Landscape Contractors of America	(800) 395-2522
	www.alca.org	(703) 736-9666
ALSC	American Lumber Standard Committee	(301) 972-1700
AMCA	Air Movement and Control Association International, Inc. www.amca.org	(847) 394-0150

ANLA	American Nursery & Landscape Association (Formerly: AAN - American Association of Nurserymen) www.anla.org	(202) 789-2900
ANSI	American National Standards Institute www.ansi.org	(202) 293-8020
AOSA	Association of Official Seed Analysts www.aosaseed.com	(505) 522-1437
APA	APA - The Engineered Wood Association www.apawood.org	(253) 565-6600
APA	Architectural Precast Association www.archprecast.org	(941) 454-6989
API	American Petroleum Institute www.api.org	(202) 682-8000
ARI	Air-Conditioning & Refrigeration Institute www.ari.org	(703) 524-8800
ASCA	Architectural Spray Coaters Association www.ascassoc.com	(609) 848-6120
ASCE	American Society of Civil Engineers www.asce.org	(800) 548-2723 (703) 295-6300
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers www.ashrae.org	(800) 527-4723 (404) 636-8400
ASME	ASME International (The American Society of Mechanical Engineers International) www.asme.org	(800) 843-2763 (212) 591-7722
ASSE	American Society of Sanitary Engineering www.asse-plumbing.org	(440) 835-3040
ASTM	ASTM International (American Society for Testing and Materials International) www.astm.org	(610) 832-9585
AWCMA	American Window Covering Manufacturers Association (See WCMA)	
AWI	Architectural Woodwork Institute www.awinet.org	(800) 449-8811 (703) 733-0600

AWPA	American Wood-Preservers' Association www.awpa.com	(817) 326-6300
AWS	American Welding Society www.aws.org	(800) 443-9353 (305) 443-9353
AWWA	American Water Works Association www.awwa.org	(800) 926-7337 (303) 794-7711
BHMA	Builders Hardware Manufacturers Association www.buildershardware.com	(212) 297-2122
BIA	Brick Industry Association (The) www.bia.org	(703) 620-0010
CCFSS	Center for Cold-Formed Steel Structures www.umn.edu/~ccfss	(573) 341-4471
CDA	Copper Development Association Inc. www.copper.org	(800) 232-3282 (212) 251-7200
CIMA	Cellulose Insulation Manufacturers Association www.cellulose.org	(888) 881-2462 (937) 222-2462
CISPI	Cast Iron Soil Pipe Institute www.cispi.org	(423) 892-0137
CLFMI	Chain Link Fence Manufacturers Institute	(301) 596-2583
CPPA	www.chainlinkinfo.org Corrugated Polyethylene Pipe Association www.cppa-info.org	(800) 510-2772 (202) 462-9607
CRSI	Concrete Reinforcing Steel Institute www.crsi.org	(847) 517-1200
CSA	CSA International (Formerly: IAS - International Approval Services) www.csa-international.org	(800) 463-6727 (416) 747-4000
CSI	Construction Specifications Institute (The) www.csinet.org	(800) 689-2900 (703) 684-0300
DHI	Door and Hardware Institute www.dhi.org	(703) 222-2010
EIA	Electronic Industries Alliance www.eia.org	(703) 907-7500

EJMA	Expansion Joint Manufacturers Association, Inc. www.ejma.org	(914) 332-0040
FCI	Fluid Controls Institute www.fluidcontrolsintitute.org	(216) 241-7333
FGMA	Flat Glass Marketing Association (See GANA)	
FM	Factory Mutual System (See FMG)	
FMG	FM Global (Formerly: FM - Factory Mutual System) www.fmglobal.com	(401) 275-3000
FSC	Forest Stewardship Council www.fscoax.org	52 951 5146905
GANNA	Glass Association of North America (Formerly: FGMA - Flat Glass Marketing Association) www.glasswebsite.com/ganna	(785) 271-0208
GTA	Glass Tempering Division of Glass Association of North America (See GANA)	
HI	Hydraulic Institute www.pumps.org	(888) 786-7744 (973) 267-9700
HMMA	Hollow Metal Manufacturers Association (See NAAMM)	
HPVA	Hardwood Plywood & Veneer Association www.hpva.org	(703) 435-2900
HPW	H. P. White Laboratory, Inc. www.hpwhite.com	(410) 838-6550
IAS	International Approval Services (See CSA)	
ICEA	Insulated Cable Engineers Association, Inc. www.icea.net	(770) 830-0369
ICRI	International Concrete Repair Institute, Inc. www.icri.org	(847) 827-0830

IEC	International Electrotechnical Commission www.iec.ch	41 22 919 02 11
IEEE	Institute of Electrical and Electronics Engineers, Inc. (The) www.ieee.org	(212) 419-7900
IESNA	Illuminating Engineering Society of North America www.iesna.org	(212) 248-5000
IGCC	Insulating Glass Certification Council www.igcc.org	(315) 646-2234
IGMA	Insulating Glass Manufacturers Alliance (The) www.igmaonline.org	(613) 233-1510
ISSFA	International Solid Surface Fabricators Association	(702) 567-8150
I3A	International Imaging Industry Association (Formerly: PIMA - Photographic & Imaging Manufacturers Association) www.pima.net	(914) 698-7603
ITS	Intertek Testing Services www.itsglobal.com	(800) 345-3851 (607) 753-6711
LPI	Lightning Protection Institute www.lightning.org	(800) 488-6864 (847) 577-7200
LSGA	Laminated Safety Glass Association (See GANA)	
MBMA	Metal Building Manufacturers Association www.mbma.com	(216) 241-7333
MFMA	Metal Framing Manufacturers Association www.metalframingmfg.org	(312) 644-6610
MHIA	Material Handling Industry of America www.mhia.org	(800) 345-1815 (704) 676-1190
ML/SFA	Metal Lath/Steel Framing Association (See SSMA)	
MPI	Master Painters Institute www.paintinfo.com	(888) 674-8937
MSS	Manufacturers Standardization Society of The Valve and Fittings Industry Inc. www.mss-hq.com	(703) 281-6613

NAAMM	National Association of Architectural Metal Manufacturers www.naamm.org	(312) 332-0405
NACE	NACE International (National Association of Corrosion Engineers International) www.nace.org	(281) 228-6200
NAMI	National Accreditation and Management Institute, Inc.	(304) 258-5100
NCMA	National Concrete Masonry Association www.ncma.org	(703) 713-1900
NECA	National Electrical Contractors Association www.necanet.org	(301) 657-3110
NeLMA	Northeastern Lumber Manufacturers' Association www.nelma.org	(207) 829-6901
NEMA	National Electrical Manufacturers Association www.nema.org	(703) 841-3200
NETA	InterNational Electrical Testing Association www.netaworld.org	(303) 697-8441
NFPA	National Fire Protection Association	(800) 344-3555
	www.nfpa.org	(617) 770-3000
NGA	National Glass Association www.glass.org	(703) 442-4890
NRCA	National Roofing Contractors Association	(800) 323-9545
	www.nrca.net	(847) 299-9070
NRMCA	National Ready Mixed Concrete Association	(888) 846-7622
NSA	www.nrmca.org National Stone Association (See NSSGA)	(301) 587-1400
NSF	NSF International (National Sanitation Foundation International) www.nsf.org	(800) 673-6275 (734) 769-8010
NSSGA	National Stone, Sand & Gravel Association (Formerly: NSA - National Stone Association) www.nssga.org	(800) 342-1415 (703) 525-8788
PCI	Precast/Prestressed Concrete Institute www.pci.org	(312) 786-0300

PDCA	Painting and Decorating Contractors of America www.pdca.com	(800) 332-7322 (703) 359-0826
PDI	Plumbing & Drainage Institute www.pdionline.org	(800) 589-8956 (508) 230-3516
PGI	PVC Geomembrane Institute //pgi-tp.ce.uiuc.edu	(217) 333-3929
RCSC	Research Council on Structural Connections www.boltcouncil.org	(800) 644-2400 (312) 670-2400
SAE	SAE International www.sae.org	(724) 776-4841
SDI	Steel Deck Institute www.sdi.org	(847) 462-1930
SDI	Steel Door Institute www.steeldoor.org	(440) 899-0010
SGCC	Safety Glazing Certification Council www.sgcc.org	(315) 646-2234
SIGMA	Sealed Insulating Glass Manufacturers Association (See IGMA)	
SJI	Steel Joist Institute www.steeljoist.org	(843) 626-1995
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association www.smacna.org	(703) 803-2980
SPFA	Spray Polyurethane Foam Alliance (Formerly: SPI/SPFD - The Society of the Plastics Industry, Inc.; Spray Polyurethane Foam Division) www.sprayfoam.org	(800) 523-6154
SPIB	Southern Pine Inspection Bureau (The) www.spib.org	(850) 434-2611
SSINA	Specialty Steel Industry of North America www.ssina.com	(800) 982-0355 (202) 342-8630
SSMA	Steel Stud Manufacturers Association (Formerly: ML/SFA - Metal Lath/Steel Framing Association) www.ssma.com	(312) 456-5590

SSPC	SSPC: The Society for Protective Coatings www.sspc.org	(877) 281-7772 (412) 281-2331
SWI	Steel Window Institute www.steelwindows.com	(216) 241-7333
SWRI	Sealant, Waterproofing, and Restoration Institute www.swrionline.org	(816) 472-7974
TIA/EIA	Telecommunications Industry Association/Electronic Industries Alliance www.tiaonline.org	(703) 907-7700
UL	Underwriters Laboratories Inc. www.ul.com	(800) 704-4050 (847) 272-8800
UNI	Uni-Bell PVC Pipe Association www.uni-bell.org	(972) 243-3902
WCLIB	West Coast Lumber Inspection Bureau www.wclib.org	(800) 283-1486 (503) 639-0651
WCSC	Window Covering Safety Council (Formerly: WCMA - Window Covering Manufacturers Association) www.windowcoverings.org	(800) 506-4636 (212) 661-4261
WDMA	Window & Door Manufacturers Association (Formerly: NWWDA - National Wood Window and Door Association) www.wdma.com	(800) 223-2301 (847) 299-5200

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

BOCA	BOCA International, Inc. www.bocai.org	(708)799-2300
IAPMO	International Association of Plumbing and Mechanical Officials (The) www.iapmo.org	(909) 595-449
ICBO	International Conference of Building Officials www.icbo.org	(800) 284-4406 (562) 699-0541

ICC	International Code Council, Inc. (Formerly: CABO - Council of American Building Officials) www.intlcode.org	(703) 931-4533
SBCCI	Southern Building Code Congress International, Inc. www.sbcci.org	(205)591-1853

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

CE	Army Corps of Engineers www.usace.army.mil	
CPSC	Consumer Product Safety Commission www.cpsc.gov	(800) 638-2772 (301) 504-0990
DOC	Department of Commerce www.doc.gov	(202) 482-2000
EPA	Environmental Protection Agency www.epa.gov	(202) 260-2090
FAA	Federal Aviation Administration www.faa.gov	(202) 366-4000
FDA	Food and Drug Administration www.fda.gov	(888) 463-6332
GSA	General Services Administration www.gsa.gov	(202) 708-5082
HUD	Department of Housing and Urban Development www.hud.gov	(202)708-1112
LBL	Lawrence Berkeley Laboratory (See LBNL)	
LBNL	Lawrence Berkeley National Laboratory www.lbl.gov	(510) 486-5605
NCHRP	National Cooperative Highway Research Program (See TRB)	

NIST	National Institute of Standards and Technology www.nist.gov	(301) 975-6478
OSHA	Occupational Safety & Health Administration www.osha.gov	(800) 321-6742 (202) 693-1999
PBS	Public Building Service (See GSA)	
RUS	Rural Utilities Service (See USDA)	(202) 720-9540
TRB	Transportation Research Board www.nas.edu/trb	(202) 334-2934
USDA	Department of Agriculture www.usda.gov	(202) 720-2791
USPS	Postal Service www.usps.com	(202) 268-2000

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

END OF SECTION 01420

SECTION 01500

TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Bid Forms and Contract Requirements and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes requirements for temporary facilities and controls, including temporary utilities, support facilities, and security and protection facilities.
- B. Temporary utilities include, but are not limited to, the following:
 - 1. Sewers and drainage.
 - 2. Water service and distribution.
 - 3. Sanitary facilities, including toilets, wash facilities, and drinking-water facilities.
 - 4. Heating and cooling facilities.
 - 5. Ventilation.
 - 6. Electric power service.
 - 7. Lighting.
 - 8. Telephone service.
- C. Support facilities include, but are not limited to, the following:
 - 1. Temporary roads.
 - 2. Project identification and temporary signs.
 - 3. Waste disposal facilities.
 - 4. Storage and fabrication sheds.
 - 5. Lifts and hoists.
 - 6. Construction aids and miscellaneous services and facilities.
- D. Security and protection facilities include, but are not limited to, the following:
 - 1. Environmental protection.
 - 2. Stormwater control.
 - 3. Barricades, warning signs, and lights.
 - 4. Temporary enclosures.
 - 5. Temporary partitions.
 - 6. Traffic controls.

7. Fire protection.
- E. Related Sections include the following:
1. Division 1 Section "Submittal Procedures" for procedures for submitting copies of implementation and termination schedule and utility reports.
 2. Division 1 Section "Execution Requirements" for progress cleaning requirements.
 3. Division 2 Section "Work Item Scopes" for temporary barricades and traffic controls.

1.3 USE CHARGES

- A. General: Cost or use charges for temporary facilities are not chargeable to Owner or Engineer and shall be included in the Contract Sum. Allow other entities to use temporary services and facilities without cost, including, but not limited to, the following:
1. Owner's construction forces.
 2. Occupants of Project.
 3. Engineer and Subconsultants.
 4. Testing agencies.
 5. Personnel of authorities having jurisdiction.
- B. Sewer Service: Pay sewer service use charges for sewer usage, by all parties engaged in construction, at Project site.
- C. Water Service: Pay water service use charges, whether metered or otherwise, for water used by all entities engaged in construction activities at Project site.
- D. Electric Power Service: Provide separate meter and electric power service use charges, for electricity used by all entities engaged in construction activities at Project site.

1.4 SUBMITTALS

- A. Temporary Utility Reports: Submit reports of tests, inspections, meter readings, and similar procedures performed on temporary utilities.
- B. Implementation and Termination Schedule: Include on Contractor's Construction Schedule, implementation and termination of each temporary utility.

1.5 QUALITY ASSURANCE

- A. Standards: Comply with ANSI A10.6, NECA's "Temporary Electrical Facilities," and NFPA 241.
 - 1. Trade Jurisdictions: Assigned responsibilities for installation and operation of temporary utilities are not intended to interfere with trade regulations and union jurisdictions.
 - 2. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
- B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

1.6 PROJECT CONDITIONS

- A. Conditions of Use: The following conditions apply to use of temporary services and facilities by all parties engaged in the Work
 - 1. Keep temporary services and facilities clean and neat.
 - 2. Relocate temporary services and facilities as required by progress of the Work.

PART 2 PRODUCTS

2.1 MATERIALS

- A. General: Provide new materials. Undamaged, previously used materials in serviceable condition may be used if approved by Engineer. Provide materials suitable for use intended.
- B. Tarpaulins: Fire-resistive labeled with flame-spread rating of 15 or less.
- C. Water: Potable.

2.2 EQUIPMENT

- A. General: Provide equipment suitable for use intended.

- B. Fire Extinguishers: Hand carried, portable, UL rated. Provide class and extinguishing agent as indicated or a combination of extinguishers of NFPA-recommended classes for exposures.
- C. Self-Contained Toilet Units: Single-occupant units of chemical, aerated recirculation, or combustion type; vented; fully enclosed with a glass-fiber-reinforced polyester shell or similar nonabsorbent material.
- D. Drinking-Water Fixtures: Containerized, tap-dispenser, bottled-water drinking-water units, including paper cup supply.
- E. Electrical Outlets: Properly configured, NEMA-polarized outlets to prevent insertion of 110- to 120-V plugs into higher-voltage outlets; equipped with ground-fault circuit interrupters, reset button, and pilot light.

PART 3 EXECUTION

3.1 INSTALLATION, GENERAL

- A. Owner shall provide a temporary staging area for storage of materials and equipment.
 - 1. Owner will select area. Job site trailer, storage of trucks or large sheds will not be permitted.
 - 2. Contractor shall provide fencing locks and provisions to secure temporary staging areas.

3.2 TEMPORARY UTILITY INSTALLATION

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

- B. Sewers and Drainage: Where applicable, provide temporary connections to remove effluent that can be discharged lawfully. If sewers are not available or cannot be used, provide drainage ditches, dry wells, stabilization ponds, and similar facilities. If neither sewers nor drainage facilities can be lawfully used for discharge of effluent, provide containers to remove and dispose of effluent off-site in a lawful manner.
1. Filter out excessive soil, construction debris, chemicals, oils, and similar contaminants that might clog sewers or pollute waterways before discharge.
 2. Provide temporary filter beds, settlement tanks, separators, and similar devices to purify effluent to levels acceptable to authorities having jurisdiction.
- C. Water Service: Install water service and distribution piping in sizes and pressures adequate for construction until permanent water service is in use. Sterilize temporary water piping before use.
- D. Sanitary Facilities: The Contractor's personnel may use the public restrooms at the Airport including toilets, wash facilities, and drinking-water fixtures.
1. Toilets: Use of Owner's existing public toilet facilities will be permitted.
 2. Disposable Supplies: Provide toilet tissue, paper towels, paper cups, and similar disposable materials for each facility. Maintain adequate supply. Provide covered waste containers for disposal of used material.
 3. Wash Facilities:
 - a. Provide safety showers, eyewash fountains, and similar facilities for convenience, safety, and sanitation of personnel.
- E. Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment from that specified that will not have a harmful effect on completed installations or elements being installed.
- F. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment from that specified that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to

produce ambient condition required and minimize energy consumption.

- G. Electric Power Service: Provide weatherproof, grounded electric power service and distribution system of sufficient size, capacity, and power characteristics during construction period. Include meters, transformers, overload-protected disconnecting means, automatic ground-fault interrupters, and main distribution switchgear as required.
 - 1. Connect temporary service, as directed by electric company officials.
 - 2. Provide waterproof connectors to connect separate lengths of electrical power cords if single lengths will not reach areas where construction activities are in progress. Do not exceed safe length-voltage ratio.
 - 3. Provide warning signs at power outlets other than 110 to 120 V.
 - 4. Provide 4-gang outlets, spaced so 100-foot extension cord can reach each area for power hand tools and task lighting. Provide a separate 125-V ac, 20-A circuit for each outlet.
- H. Electric Distribution: Provide receptacle outlets adequate for connection of power tools and equipment.
- I. Lighting: Where required provide temporary lighting with local switching that provides adequate illumination for construction operations and traffic conditions.
 - 1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.
 - 2. Provide one 100-W incandescent lamp per 500 sq. ft., uniformly distributed, for general lighting, or equivalent illumination.
 - 3. Install exterior-yard site lighting that will provide adequate illumination for construction operations, traffic conditions, and signage visibility when the Work is being performed.
- J. Telephone Service: Provide temporary telephone service throughout construction period for common-use by all personnel engaged in construction activities;
 - 1. Provide a portable cellular telephone for superintendent's use in making and receiving telephone calls.

3.3 SUPPORT FACILITIES INSTALLATION

- A. General: Comply with the following:
 - 1. Locate storage sheds, sanitary facilities, and other temporary construction and support facilities for easy access.
 - 2. Provide incombustible construction for shops, and sheds located within construction area. Comply with NFPA 241.
 - 3. Remove shops, sheds and temporary construction and support facilities before Substantial Completion.
- B. Traffic Controls: Provide temporary traffic controls as indicated in the contract documents or as directed by the Engineer. Include warning, information and directional signs for pedestrian and traffic controls.
- C. Project Identification and Temporary Signs: If requested by The Owner, at additional (change order) cost, and at the Engineers direction, prepare project identification sign 4ft x 8ft with project rendering, owner's, engineers names & logos, submit proposed project sign layout for engineers review. Install signs where indicated or directed. Prepare, provide and install pedestrian and vehicular traffic signs in and around construction site for directional information. Do not permit installation of unauthorized signs.
 - 1. Engage an experienced sign painter to apply graphics for Project identification signs.
 - 2. Prepare, provide, and install temporary signs to provide directional information to construction personnel and visitors.
 - 3. Construct signs of exterior-type Grade B-B high-density concrete form overlay plywood in sizes and thicknesses indicated. Support on posts or framing of preservative-treated wood or steel.
 - 4. Paint sign panel and applied graphics with exterior-grade alkyd gloss enamel over exterior primer. Colors shall conform to MUTCD for each sign type.
- D. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Containerize and clearly label hazardous, dangerous, or unsanitary waste materials separately from other waste. Comply with Division 1 Section "Execution Requirements" for progress cleaning requirements.
 - 1. If required by authorities having jurisdiction, provide separate containers, clearly labeled, for each type of waste material to be

deposited.

- E. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment involved, including temporary utility services. Sheds may be open shelters or fully enclosed spaces within building or elsewhere within the project site limits.
 - 1. Construct framing, sheathing, and siding using fire-retardant-treated lumber and plywood.
 - 2. Paint exposed lumber and plywood with exterior-grade acrylic-latex emulsion over exterior primer.
- F. Lifts and Hoists: Provide facilities for hoisting materials and personnel. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.
- G. Temporary Stairs: Until permanent stairs are available, provide temporary stairs where ladders are not adequate. Cover finished, permanent stairs with protective covering of plywood or similar material so finishes will be undamaged at time of acceptance.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects. Avoid using tools and equipment that produce harmful noise. Restrict use of noisemaking tools and equipment to hours that will minimize complaints from persons or firms near Project site. Reference section "Work Restrictions" for hours of work and noise limits.
- B. Security Enclosure and Lockup: Install substantial temporary enclosure around areas of storage and stockpile areas. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security.
- C. Barricades, Warning Signs, and Lights: Comply with standards and code requirements for erecting structurally adequate barricades. Paint with appropriate colors, graphics, and warning signs to inform personnel and public of possible hazard. Where appropriate and needed, provide lighting, including flashing red or amber lights.
 - 1. For safety barriers, and similar uses, provide minimum 5/8-inch-thick exterior plywood.

- D. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities.
 - 1. Where temporary wood or plywood enclosure exceeds 100 sq. ft. in area, use fire-retardant-treated material for framing and main sheathing.
- E. Temporary Fire Protection: Until fire-protection needs are supplied by permanent facilities, install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241.
 - 1. Provide fire extinguishers, installed on walls on mounting brackets, visible and accessible from space being served, with sign mounted above.
 - a. Other Locations: Class ABC dry-chemical extinguishers or a combination of extinguishers of NFPA-recommended classes for exposures.
 - b. Locate fire extinguishers where convenient and effective for their intended purpose; provide not less than one extinguisher on each floor at or near each usable stairwell.
 - 2. Store combustible materials in containers in fire-safe locations.
 - 3. Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire- protection facilities, stairways, and other access routes for firefighting. Prohibit smoking in hazardous fire-exposure areas.
 - 4. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition.
 - 5. Develop and supervise an overall fire-prevention and first-aid fire-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.

3.5 OPERATION, TERMINATION, AND REMOVAL

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

- B. Maintenance: Maintain facilities in good operating condition until removal. Protect from damage caused by freezing temperatures and similar elements.
1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
 2. Prevent water-filled piping from freezing.
- C. Termination and Removal: Remove each temporary facility when need for its service has ended. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
1. Materials and facilities that constitute temporary facilities are the property of Contractor. Owner reserves right to take possession of Project identification signs.
 2. Remove temporary paving not intended for or acceptable for integration into permanent paving. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that might impair growth of plant materials or lawns. Repair or replace street paving, curbs, and sidewalks at temporary entrances, as required by authorities having jurisdiction.
 3. Comply with final cleaning requirements in Division 1 Section "Closeout Procedures."

END OF SECTION 01500

SECTION 01540

SITE SECURITY

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Bid Forms and Contract Requirements and other Division 1 Specification Sections, apply to this Section.

1.2 DESCRIPTION

- A. Provide protection for materials, tools and equipment being employed on the Project including the tools of workers. The Owner shall not be held to have incurred any liability for loss of, and damage to, materials, tools and equipment of the Contractor, or of those employed by him, by contract or otherwise.
- B. The Contractor shall employ such security service as he may deem necessary to properly protect and safeguard the work. The Owner shall not in any way be liable or responsible for the damage or loss to the work due to trespass or theft.
- C. The Owner may provide such security service as he deems necessary to protect his interest during the progress of the work. Any protection provided by the Owner shall not in any way relieve the Contractor of the responsibility for the safety of the work and acceptance thereof.
- D. The Contractor shall be responsible for controlling access to the work area and insuring that airport security is maintained at all times, including set-back security clearances enforced at the Airport and Parking Garage. The TSA can impose fines of \$11,000.00 or more for security violations and incursions into active aircraft operation areas. The contractor shall pay all fines assessed against the airport due to violations caused by the Contractor and his personnel, subcontractors, and vendors.
- E. Parking of personal cars at the work sites will not be permitted, except in areas indicated on contract drawings or specifically authorized by the Engineer. The Contractor, as a subsidiary obligation shall provide adequate and safe transportation for his employees from the area where the cars are parked, to and from the work area. Employees and drivers of work vehicles will be instructed as to proper access roads and will be cautioned that unauthorized use of aircraft pavements or other areas outside the designated work area may lead to their arrest and subsequent payment of fines.

- F. All orders for material shall instruct the supplier of the procedures to be followed.
- G. The Contractor shall submit, if required by the Engineer, to the Owner within 10 days after signing of the contract a written Method of Operations detailing the precautions he proposes for the control of vehicle traffic including flagperson, signs, escorts and any other measures he proposes. After Owner approval of the Operations, the Contractor shall follow it explicitly. The Owner may close the work at any time this schedule is violated so as not to endanger airport or aircraft operations. Such closure shall not be considered a valid reason for extending the contract time or for any claim for extras by the Contractor.
- H. All security arrangements shall be subject to the approval of the Owner.
- I. The Contractor's personnel and vehicles will not have access to the entire Airport, but shall be limited to work areas and the staging area.
- J. The Contractor shall identify each motorized vehicle or piece of construction equipment in reasonable conformance to AC 150/5370-2.

1.3 PROTECTION

- A. Continuously maintain protection as necessary to protect the work as a whole and in part, and adjacent property and improvements from accidents, injuries or damage.
- B. Properly protect the work:
 - 1. With lights, guard rails, temporary covers, and barricades.
 - 2. Enclose excavations with proper barricades.
 - 3. Brace and secure all parts of the work against storm and accident.
 - 4. Provide such additional forms of protection which may be necessary under existing circumstances.
- C. Provide and maintain in good condition all protective measures required to adequately protect the public from hazards resulting from the work and to exclude unauthorized persons from the work. When regulated by Building Code, OSHA or other authority, such legal requirements for protection shall be considered as minimum requirements.

1.4 IDENTIFICATION OF EMPLOYEES

- A. The Contractor shall furnish and issue, to each of his employees and the employees of all subcontractors, an identification badge which the employees will be required to wear at all times on the site. The badge shall be a minimum of 2.5 inches by 4 inches, laminated in plastic or protective sleeve, and have a

clip for attaching to exterior of clothing or alternate as approved by the Owner. The badge shall have the following information:

1. Employee's Name (1/4" high lettering);
2. The Contractor's name (1/4" high lettering);
3. Subcontractor's name, if applicable (1/8" high lettering);
4. Manchester Airport (1/8" high lettering);
5. Badge Number (1/4" high lettering) as established by Contractor.

- B. Temporary badges may be issued for employees to be on the site less than one week. The temporary badges shall be as described above.
- C. The Contractor shall provide the Owner with a list of employees on the job site and their badge number. The list shall include subcontractors and employees. The list shall be updated and submitted weekly.

1.5 CONTROL OF SITE

- A. The Contractor shall ensure that no alcohol, firearm, weapon or controlled substance enters or is used at the Project site. The Contractor shall immediately remove from the site and terminate the employment of any employee found in violation of this provision.
- B. Install temporary enclosure of partially completed construction areas to prevent unauthorized entrance, vandalism and theft.
- C. Secure temporary storage areas as required to prevent theft.
- D. To the extent possible through reasonable control and protection methods, supervise performance of work in a manner and by means which will ensure that none of the work, whether completed or in progress, will be subjected to harmful, dangerous, damaging, or otherwise deleterious exposures during construction period. Such exposures include (where applicable, but not by way of limitation) static loading, dynamic loading, internal pressures, external pressures, high or low temperatures, thermal shock, high or low humidity, air contamination or pollution, water, solvents, chemicals, light, radiation, puncture, abrasion, heavy traffic, soiling, bacteria, insect infestation, combustion, electrical current, high speed operation, improper lubrication, unusual wear, misuse, incompatible interface, destructive testing, misalignment, excessive weathering, unprotected storage, improper shipping and handling, theft and vandalism.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

END OF SECTION 01540

SECTION 01545

SAFETY PROGRAM

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Bid Forms and Contract Requirements and other Division 1 Specification Sections, apply to this Section.

1.2 DESCRIPTION

- A. The Contractor (and his subcontractors) shall, at all times, exercise reasonable precautions for the safety of all persons. All rules, regulations, and laws concerning safety that are in effect at the work site, and in particular, all applicable regulations of the Occupational Safety and Health Administration (OSHA) of the U.S. Government, in addition to all the requirements of these specifications, shall be complied with in all respects.
- B. The Contractor shall provide adequate equipment and facilities as are necessary and required for first aid service to any person who may be injured in the prosecution the work under this contract whether they are his own personnel, his subcontractor's personnel, the owner's representative, or other persons who may for any reason enter within the limits of the contract work. Also the Contractor shall have standing arrangements for or have effective written procedure on site, to care, and for removal and hospital treatment of any person who may be injured. Such equipment or facilities and arrangements shall be satisfactory to the Owner.
- C. Attention shall be directed to the requirements that the Contractor comply with all pertinent provisions of the "Manual of Accident Prevention in Construction" issued by the Associated General Contractors of America, Inc.
- D. Within 7 days after Notice to Proceed, Contractor shall submit a Safety Program to the Owner for review. The Contractor shall be required to comply with the Safety Program and all applicable Federal, State, and local regulation codes, rules, laws and ordinances.
- E. Review of the Safety Program shall not relieve the Contractor of any responsibility for complying with all applicable safety regulations nor, by reviewing the Safety Program, will the Owner assume any of the Contractor's responsibilities for compliance with the said safety regulations.

- F. The Contractor further agrees to indemnify and hold the Owner harmless for, of and from any loss including but not limited to fines, legal fees, penalties and corrective measures. The Owner may sustain by reason of the Contractor's failure to comply with said laws, rules and regulations in connection with the performance of this Contract.
- G. It is essential that each Contractor and Subcontractor implement an effective and vigorous Safety and Health Program to cover his portion of the work. It shall be understood that the full responsibility for providing a safe place to work with respect to his portion of the work rests with each individual contractor.
- H. Contractor will establish and adhere to a Notification Procedure for both emergency and non-emergency information distribution with the Airport Administration, Airport Communications Center, ATCT, Police Department, CFR and Operations.

1.3 SAFETY REQUIREMENTS

- A. Standards: Maintain the Project in accordance with State and local safety and insurance standards.
- B. The wearing of non-conducting, hard, safety hats on the job is mandatory. The Contractor shall be responsible for and shall enforce the wearing of such safety hats by his personnel and the personnel of his subcontractors. The Contractor shall keep at least 5 safety hats at the work site for use by others inspecting or visiting the work site.
- C. All employees must wear approved safety shoes unless special shoes for the types of work are required.
- D. All tools and devices that require electric power shall be properly grounded.
- E. Safety glasses shall be worn by all workmen when performing operations hazardous to the eyes, and all welders shall be provided with suitable welding masks.
- F. Hazards Control:
 - 1. Store volatile wastes in covered metal containers, and remove from premises daily.
 - 2. Prevent accumulation of wastes which create hazardous conditions.
 - 3. Provide adequate ventilation during use of volatile or noxious substances.
 - 4. Cover trash bins and containers to discourage animals and prevent blow-away of debris.

- G. Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.
1. Do not burn or bury rubbish and waste materials on Project site.
 2. Do not dispose of volatile wastes such as mineral spirits, oil, or paint thinner in storm or sanitary drains.
 3. Dispose of all wastes in a legal manner.
- H. Provide accident information on the forms provided by the Owner. This information will be provided on the same day as the occurrence of said incident.
- I. The Owner will identify safety issues as they become apparent and will issue Notices of Noncompliance to the Contractor. These notices, however, do not relieve the Contractor of the sole responsibility for safety on the job site.
- J. In the event of any emergency constituting an immediate hazard to health or safety of Owner employees, property, or licensees, the Owner may undertake at the Contractor's expense, without prior notice, all work necessary to correct such hazardous conditions when it was caused by work of the Contractor not being in accordance with requirements of this contract.
- K. If at any time, in the sole judgment of the Owner, the work is not properly lighted, barricaded or in any other respects safe in regard to public travel, persons on or about the work, or public or private property, the Owner shall have the right to order such safeguards to be erected and such precautions to be taken as he deems advisable, and the Contractor shall comply promptly with such orders. If, under such circumstances, the Contractor does not or cannot immediately put the work and the safeguards into proper and approved condition or if the Contractor or his representative is not upon the site so that he can be notified immediately of the insufficiency of safety precautions, the Owner may put the work into such a condition that it shall be, in his opinion, in all respects safe.

The Owner has the right to shut down the job site if the Contractor does not comply with the Owner written requests of Non-Compliance in the form of a D/O. In such an occurrence the Contractor abandons his/her rights for claiming cost or schedule compensation for any related delays.

The Contractor shall pay all costs and expenses incurred by the Owner in so doing. Such action of the Owner, or their failure to take such action, shall in no way relieve or diminish the responsibility of the Contractor for any and all costs, expenses, losses, liability, suits, proceedings, judgments, awards or damages resulting from, by reason of or in connection with any failure to take safety precautions of the insufficiency or the safety precautions taken by him or by the Owner acting under authority of this paragraph.

- L. Fire Prevention: All operations in connection with the contract work shall be so performed that no fire hazards are needlessly created or permitted to exist. If the contract work involves a fire hazard, sufficient firefighting equipment with trained, capable operators shall be in the area to contain any fire until the local fire department is able to arrive. Particular care shall be exercised with regard to the disposition of waste materials, the nature of quality of which might create or increase a fire hazard. The Contractor shall make sure that persons employed directly or indirectly by him while working in connection with this contract comply with any fire prevention regulations of the Owner. The Contractor shall also have a procedure for promptly notifying local firefighting organizations in case of fire. The Contractor shall be responsible for compliance by personnel of his organization for their cooperation in fire prevention, fire reporting, and protective measures to minimize loss.

1.4 ENVIRONMENTAL CONTROL OFFICER

- A. The Contractor shall designate one of his staff as "Environmental Control Officer", whose duties shall include the responsibility for enforcing the environmental protection provisions of these Specifications including safety and health; the requirements of the Occupational Safety and Health Act; and other applicable Federal, State, and local standards. Contractor shall submit, for information his intended traffic flow plan, security plan, program for temporary structures, housecleaning plan, erosion control plan, demolition program, and safety and health plan.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

END OF SECTION 01545

SECTION 01600

PRODUCT REQUIREMENTS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Bid Forms and Contract Requirements and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following administrative and procedural requirements: selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; product substitutions; and comparable products.
- B. Related Sections include the following:
 - 1. Division 1 Section "References" for applicable industry standards for products specified.
 - 2. Division 1 Section "Closeout Procedures" for submitting warranties for contract closeout.
 - 3. Divisions 2 through 16 Sections for specific requirements for warranties on products and installations specified to be warranted.

1.3 DEFINITIONS

- A. Products: Items purchased for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
 - 1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation, shown or listed in manufacturer's published product literature that is current as of date of the Contract Documents.
 - 2. New Products: Items that have not previously been incorporated into another project or facility, except that products consisting of recycled-content materials are allowed, unless explicitly stated otherwise. Products salvaged or recycled from other projects are not considered new products.

3. Comparable Product: Product that is demonstrated and approved through submittal process, or where indicated as a product substitution, to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.
- B. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.
- C. Basis-of-Design Product Specification: Where a specific manufacturer's product is named and accompanied by the words "basis of design," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of other named manufacturers.
- D. Manufacturer's Warranty: Preprinted written warranty published by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
- E. Special Warranty: Written warranty required by or incorporated into the Contract Documents, either to extend time limit provided by manufacturer's warranty or to provide more rights for Owner.

1.4 SUBMITTALS

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

3. Initial Submittal: Within 5 days after date of commencement of the Work, submit 3 copies of initial product list. Include a written explanation for omissions of data and for variations from Contract requirements.
 - a. At Contractor's option, initial submittal may be limited to product selections and designations that must be established early in Contract period.
 4. Completed List: Within 15 days after date of commencement of the Work, submit 3 copies of completed product list. Include a written explanation for omissions of data and for variations from Contract requirements.
 5. Engineer's Action: Engineer will respond in writing to Contractor within 5 days of receipt of completed product list. Engineer's response will include a list of unacceptable product selections and a brief explanation of reasons for this action. Engineer's response, or lack of response, does not constitute a waiver of requirement that products comply with the Contract Documents.
- B. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
1. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
 - a. Statement indicating why specified material or product cannot be provided.
 - b. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.
 - c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
 - d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
 - e. Samples, where applicable or requested.
 - f. List of similar installations for completed projects with project names and addresses and names and addresses of engineers and owners.

- g. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
 - h. Research/evaluation reports evidencing compliance with building code in effect for Project, from a model code organization acceptable to authorities having jurisdiction.
 - i. Detailed comparison of Contractor's Construction Schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating lack of availability or delays in delivery.
 - j. Cost information, including a proposal of change, if any, in the Contract Sum.
 - k. Contractor's certification that proposed substitution complies with requirements in the Contract Documents and is appropriate for applications indicated.
 - l. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
2. Engineer's Action: If necessary, Engineer will request additional information or documentation for evaluation within one week of receipt of a request for substitution. Engineer will notify Contractor of acceptance or rejection of proposed substitution within five days of receipt of request, or five days of receipt of additional information or documentation, whichever is later.
- a. Form of Acceptance: Change Order.
 - b. Use product specified if Engineer does not render a decision on use of a proposed substitution within time allocated.

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

1.5 QUALITY ASSURANCE

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

1. Each contractor is responsible for providing products and construction methods compatible with products and construction methods of other contractors.
2. If a dispute arises between contractors over concurrently selectable but incompatible products, Engineer will determine which products shall be used.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft. Comply with manufacturer's written instructions.
 1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
 2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
 3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
 4. Inspect products on delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.
 5. Store products to allow for inspection and measurement of quantity or counting of units.
 6. Store materials in a manner that will not endanger Project structure.
 7. Store products that are subject to damage by the elements, under cover in a weather tight enclosure above ground, with ventilation adequate to prevent condensation.
 8. Comply with product manufacturers written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
 9. Protect stored products from damage.
- B. Storage: Provide a secure location and enclosure at Project site for storage of materials and equipment for Owner. Coordinate location with Owner.

1.7 PRODUCT WARRANTIES

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

relieve Contractor of obligations under requirements of the Contract Documents.

- B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution. Submit a draft for approval before final execution.
 - 1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
 - 2. Refer to Divisions 2 through 16 Sections for specific content requirements and particular requirements for submitting special warranties.
- C. Submittal Time: Comply with requirements in Division 1 Section "Closeout Procedures."

PART 2 PRODUCTS

2.1 PRODUCT OPTIONS

- A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged, and unless otherwise indicated, that are new at time of installation.
 - 1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
 - 2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
 - 3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
 - 4. Where products are accompanied by the term "as selected," Engineer will make selection.
 - 5. Where products are accompanied by the term "match sample," sample to be matched is approved sample.
 - 6. Descriptive, performance, and reference standard requirements in the Specifications establish "salient characteristics" of products.
 - 7. Or Equal: Where products are specified by name and accompanied by the term "or equal" or "or approved equal" or "or approved," comply with provisions in "Comparable Products" Article to obtain approval for use of an unnamed product.

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

1. Product: Where Specification paragraphs or subparagraphs titled "Product" name a single product and manufacturer, provide the product named.
 - a. Substitutions may be considered, unless otherwise indicated.
2. Manufacturer/Source: Where Specification paragraphs or subparagraphs titled "Manufacturer" or "Source" name single manufacturers or sources, provide a product by the manufacturer or from the source named that complies with requirements.
 - a. Substitutions may be considered, unless otherwise indicated.
3. Products: Where Specification paragraphs or subparagraphs titled "Products" introduce a list of names of both products and manufacturers, provide one of the products listed that complies with requirements.
 - a. Substitutions may be considered, unless otherwise indicated.
4. Manufacturers: Where Specification paragraphs or subparagraphs titled "Manufacturers" introduce a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements.
 - a. Substitutions may be considered, unless otherwise indicated.
5. Available Products: Where Specification paragraphs or subparagraphs titled "Available Products" introduce a list of names of both products and manufacturers, provide one of the products listed or another product that complies with requirements. Comply with provisions in "Comparable Products" Article to obtain approval for use of an unnamed product.
6. Available Manufacturers: Where Specification paragraphs or subparagraphs titled "Available Manufacturers" introduce a list of manufacturers' names, provide a product by one of the manufacturers listed or another manufacturer that complies with requirements. Comply with provisions in "Comparable Products" Article to obtain approval for use of an unnamed product.
7. Product Options: Where Specification paragraphs titled "Product Options" indicate that size, profiles, and dimensional requirements on Drawings are based on a specific product or system, provide either the specific product or system indicated or a comparable product or system by another manufacturer. Comply with provisions in "Product Substitutions" Article.
8. Visual Matching Specification: Where Specifications require matching an established Sample, select a product (and manufacturer) that complies with requirements and matches sample. Final decision

will be based on whether a proposed product matches satisfactorily.

- a. If no product available within specified category matches satisfactorily and complies with other specified requirements, comply with provisions of the Contract Documents on "substitutions" for selection of a matching product.
9. Visual Selection Specification: Where Specifications include the phrase "as selected from manufacturer's colors, patterns, textures" or a similar phrase, select a product (and manufacturer) that complies with other specified requirements.
- a. Standard Range: Where Specifications include the phrase "standard range of colors, patterns, textures" or similar phrase, Engineer will select color, pattern, or texture from manufacturer's product line that does not include premium items.
 - b. Full Range: Where Specifications include the phrase "full range of colors, patterns, textures" or similar phrase, Engineer will select color, pattern, or texture from manufacturer's product line that includes both standard and premium items.

2.2 PRODUCT SUBSTITUTIONS

- A. Timing: Engineer will consider requests for substitution if received within 10 days after commencement of the Work. Requests received after that time may be considered or rejected at discretion of Engineer.
- B. Conditions: Engineer will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Engineer will return requests without action, except to record noncompliance with these requirements:
 1. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Engineer for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
 2. Requested substitution does not require extensive revisions to the Contract Documents.
 3. Requested substitution is consistent with the Contract Documents and will produce indicated results.
 4. Substitution request is fully documented and properly submitted.
 5. Requested substitution will not adversely affect Contractor's Construction Schedule.
 6. Requested substitution has received necessary approvals of authorities having jurisdiction.
 7. Requested substitution is compatible with other portions of the Work.

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

2.3 COMPARABLE PRODUCTS

- A. Where products or manufacturers are specified by name, submit the following, in addition to other required submittals, to obtain approval of an unnamed product:
 1. Evidence that the proposed product does not require extensive revisions to the Contract Documents, that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
 2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
 3. Evidence that proposed product provides specified warranty.
 4. List of similar installations for completed projects with project names and addresses and names and addresses of engineers and owners, if requested.
 5. Samples, if requested.

PART 3 EXECUTION (Not Used)

END OF SECTION 01600

SECTION 01700

EXECUTION REQUIREMENTS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Bid Forms and Contract Requirements and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes general procedural requirements governing execution of the Work including, but not limited to, the following:
 - 1. Construction layout.
 - 2. Field engineering and surveying.
 - 3. General installation of products.
 - 4. Progress cleaning.
 - 5. Starting and adjusting.
 - 6. Protection of installed construction.
 - 7. Correction of the Work.
- B. Related Sections include the following:
 - 1. Division 1 Section "Project Management and Coordination" for procedures for coordinating field engineering with other construction activities.
 - 2. Division 1 Section "Submittal Procedures" for submitting surveys.
 - 3. Division 1 Section "Cutting and Patching" for procedural requirements for cutting and patching necessary for the installation or performance of other components of the Work.
 - 4. Division 1 Section "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION

3.1 EXAMINATION

- A. Existing Conditions: The existence and location of site improvements, utilities, and other construction indicated as existing are not guaranteed. Before beginning work, investigate and verify the existence and location of mechanical and electrical systems and other construction affecting the Work.
- B. 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. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- B. Existing Utility Information: Furnish information to local utility and owner that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.
- C. 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 Engineer and Owner not less than two days in advance of proposed utility interruptions.

2. Do not proceed with utility interruptions without Engineers or Owners written permission.
- D. 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.
- 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 INSTALLATION

- A. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- B. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- C. 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.
- D. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.
- E. Anchors and Fasteners: Provide anchors and fasteners as required to anchor each component securely in place, accurately located and aligned with other portions of the Work.
 1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Engineer.
 2. Allow for building movement, including thermal expansion and contraction.
 3. Power activated fasteners are not allowed.
- F. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.

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

3.4 OWNER-INSTALLED PRODUCTS

- A. Site Access: Provide access to Project site for Owner's construction forces.
- B. Coordination: Coordinate construction and operations of the Work with work performed by Owner's construction forces.
 - 1. Construction Schedule: Inform Owner of Contractor's preferred construction schedule for Owner's portion of the Work. Adjust construction schedule based on a mutually agreeable timetable. Notify Owner if changes to schedule are required due to differences in actual construction progress.
 - 2. Pre-installation Conferences: Include Owner's construction forces at pre-installation conferences covering portions of the Work that are to receive Owner's work. Attend pre-installation conferences conducted by Owner's construction forces if portions of the Work depend on Owner's construction.

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.
 - 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 STARTING AND ADJUSTING

- A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
- B. Adjust operating components for proper operation without binding. Adjust equipment for proper operation.
- C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

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

3.7 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.
- B. Comply with manufacturer's written instructions for temperature and relative humidity.

3.8 CORRECTION OF THE WORK

- A. Repair or remove and replace defective construction. Restore damaged substrates and finishes. Comply with requirements in Division 1 Section "Cutting and Patching."
 - 1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.
- B. Restore permanent facilities used during construction to their specified condition.
- C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.
- D. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.
- E. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION 01700

SECTION 01720

PROJECT RECORD DOCUMENTS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Bid Forms and Contract Requirements and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section describes the requirements for maintaining records of actual conditions in the field and for changes in the work.
- B. The purpose of final Project Record Documents is to provide factual information regarding all aspects of the work, both concealed and visible, to enable future modifications of the work to proceed without lengthy and expensive site measurements, investigation, and examination.
- C. The Owner shall have access to as-built record files at any time prior to final turn over to the Owner.
- D. This complete set of drawings shall be delivered by the Contractor, in good condition, to the Owner at the completion of the work before the time when the final payment shall be due and payable. The Contractor, at all times during the project shall make available the updated mark-up set for review and/or verification by Owner on a monthly basis. Failure to provide updated RECORD DRAWINGS can delay Payment Application.

1.3 SUBMITTALS

- A. Submit the complete set of Project Record Documents to the Owner 10-days after final inspection.
- B. Participate in review meetings with the Owner as required.
- C. Make the required changes and promptly deliver the final Project Record Documents to the Owner.

- D. Accompany submittal with transmittal letter as specified in Section 01330, "Submittal Procedures". Include a signed certification that each document, as submitted, is complete and accurate.
- E. Prior to final acceptance of the work, all Project Record Documents shall be turned over to the Engineer. Failure to submit Project Record Documents may result in withholding release of any portion of the final project retainage.

1.4 DOCUMENTS REQUIRED

- A. Upon the Owner's request, make the following record documents available for review:
 - 1. Drawings.
 - 2. Specifications and Addenda.
 - 3. Change Orders and other modifications to the Contract.
 - 4. Field Instructions and other written instructions from the Owner.
 - 5. Reviewed shop drawings, product data, and samples.
 - 6. Test and Special Reports.
 - 7. Requests for Information.
 - 8. General Correspondence.
 - 9. "As-Built" Drawings.
 - 10. Contractor's Daily Construction Reports

1.5 MAINTENANCE OF DOCUMENTS AND SAMPLES

- A. Store record documents and samples in Contractor's office. Provide files and racks for storage of documents.
- B. File documents and samples in a manner acceptable to the Owner.
- C. Make documents and samples available at all times for inspection by the Owner.
- D. Update the documents within 24-hours after receiving information that a change has occurred or clarification has been issued.

1.6 MARKING DEVICES

- A. Felt tip marking pens shall be used for recording information. Red marks shall be used for added items; green marks shall be used for deleted items; and yellow marks shall be used for unchanged items.

1.7 RECORDING

- A. Label each document "PROJECT RECORD" in neat, large, printed letters.

- B. Record information concurrently with the construction process.
 - 1. Do not conceal any work until required information is recorded.
 - 2. Completely, accurately, and legibly record, to the satisfaction of the Owner, all deviations in construction, especially pipe and conduit locations, and any deviations caused by approved changes and/or clarifications to the work.
 - 3. Use additional copies of prints, if necessary, to insure legible recording of data
 - 4. Date all entries.
 - 5. Call attention to the entry by drawing a 'cloud' around the area affected.
- C. Legibly mark drawings to record actual construction:
 - 1. Field changes of dimension and detail.
 - 2. Changes made reflecting approved changes to the work.
 - 3. Details not on original contract drawings.
- D. Legibly mark each Section of the Specifications to record:
 - 1. Manufacturer, trade name, catalog number, and supplier of each product and item of equipment installed.
 - 2. Changes made reflecting approved changes to the work.
- E. Maintain shop drawings as record drawings. Legibly annotate shop drawings to record changes made after approval.
- F. Prior to submitting each request for payment, secure approval from the Owner of the current status of record documents.
- G. PERIODIC PAYMENTS OR PORTIONS THEREOF TO THE CONTRACTOR MAY BE WITHHELD UNTIL THE OWNER VERIFIES THAT ALL AS-BUILT INFORMATION TO DATE HAS BEEN PROPERLY RECORDED ON PROJECT RECORD DOCUMENTS.

1.8 CONVERSION OF SCHEMATIC LAYOUTS

- A. In some cases on the drawings, arrangement of conduits, circuits, piping, ducts, and similar items are shown schematically and are not intended to portray precise physical layout. The final physical arrangement is determined by the Contractor, subject to the approval of the Owner, and shall be accurately recorded by the Contractor on the record documents.
- B. Show on the job set of record drawings, by dimension accurate to one-inch, the centerline of each run of all items specified in the preceding paragraph.

1. Clearly identify the item by accurate note such as "cast iron drain", or 'galvanized flashing", etc.
2. Show by symbol or note the vertical location of the item ("6-inches below slab", 'in ceiling plenum', "exposed", etc.
3. Make all identification sufficiently descriptive that it may be related reliably to the Specifications

1.9 FINAL PROJECT RECORD DOCUMENTS

- A. Contractor to provide certification that record documents represent a true and accurate record of work in place.
- B. After Completion of each phase, carefully transfer all data shown on the job set of Record Drawings to the corresponding transparencies, coordinating the information as required.
- C. Clearly indicate at each affected detail and other drawings a full description of changes made during construction, and the actual location of items as previously specified.
- D. "Cloud" all affected areas.
- E. Stamp each record drawing with the following information:
 1. Project Record Document.
 2. Prepared by: Contractor's name, permanent address.
 3. Date prepared.
 4. Contractor's (Principal of firm) signature.

1.10 RESPONSIBILITY

- A. The Contractor shall be fully responsible for the accuracy and completeness of as-built records and shall bear all costs of damages incurred by the Owner of any nature whatsoever due to inaccuracies or incompleteness of said as-built records, except to the extent that conditions are disturbed by subsequent construction.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

END OF SECTION 01720

SECTION 01730

SELECTIVE DEMOLITION

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Bid Forms and Contract Requirements and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section requires the selective removal and subsequent offsite disposal of all items identified or shown in the contract documents.

1.3 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
- B. Schedule indicating proposed sequence of operations of work for review prior to start of work. Include coordination for shutoff of utility services, together with details for dust and noise control protection as required.

Provide detailed sequence of demolition and removal work to ensure uninterrupted progress of Owner's on-site operations.

- C. Coordinate with Owner's continuing occupation of portions of existing building and with Owner's partial occupancy of completed new addition.
- D. Photographs of existing conditions of structure surfaces, equipment, and adjacent improvements that might be misconstrued as damage related to removal operations. File with Owner's Representative prior to start of work.

1.4 JOB CONDITIONS

- A. Occupancy: Owner will occupy portions of the building immediately adjacent to areas of selective demolition. Conduct selective demolition work in manner that will minimize need for disruption of Owner's normal operations. Provide minimum of 72 hours advance notice to Owner of demolition activities that will affect Owner's normal operations.
- B. Condition of Structures: Owner assumes no responsibility for actual condition of items or structures to be demolished.

Conditions existing at time of inspection for bidding purposes will be maintained by Owner insofar as practicable.

- C. Partial Demolition and Removal: Items indicated to be removed but of salvageable value to Contractor may be removed from structure as work progresses. Transport salvaged items from site as they are removed.

Storage or sale of removed items on site will not be permitted.

- D. Protections: Provide temporary barricades and other forms of protection to protect Owner's personnel and general public from injury due to selective demolition work.

Provide protective measures as required to provide free and safe passage of Owner's personnel and general public to portions of the garage remaining in service.

Protect from damage existing finish work that is to remain in place and becomes exposed during demolition operations.

Protect floors with suitable coverings when necessary.

Where work methods result in airborne dust deemed a hazard or nuisance to garage patrons and/or airport operations to the Owner. The Contractor shall demonstrate the ability to control dust within levels acceptable to the Owners through the use of equipment, vacuums, wetting surfaces, etc. Where dust is not able to be controlled within acceptable levels, construct temporary dustproof partitions where required to separate areas where noisy dirty, or dusty operations are performed.

The Contractor shall have provisions in place to address patron claims regarding dust, debris, and staining of patron vehicles. Patron complaints unsuccessfully settled by the Contractor within 14 days of original notification by complainant will be settled by the Owner and resultant costs deducted from the Contractors Mobilization Fee.

Excessively noisy demolition operations, as determined by the Program Manager, may be prohibited during normal operating hours. These operations, when designated, shall be completed during non-operational hours.

Provide temporary weather protection during interval between demolition and removal of existing construction on exterior surfaces and installation of new construction to ensure that no water leakage or damage occurs to structure or prepared areas.

Remove protections at completion of work.

E. Damages: Promptly repair damages caused to adjacent facilities by demolition work.

F. Traffic: Conduct selective demolition operations and debris removal to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities.

Do not close, block, or otherwise obstruct streets, walks, or other occupied or used facilities without written permission from authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.

G. Flame Cutting: Do not use cutting torches for removal until work area is cleared of flammable materials. At concealed spaces, such as interior of ducts and pipe spaces, verify condition of hidden space before starting flame-cutting operations. Maintain portable fire suppression devices during flame-cutting operations.

H. Utility Services: Maintain existing utilities indicated to remain in service and protect them against damage during demolition operations.

Do not interrupt utilities serving occupied or used facilities, except when authorized in writing by authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to governing authorities.

Maintain fire protection services during selective demolition operations.

I. Environmental Controls: Use water sprinkling, temporary enclosures, and other methods to limit dust and dirt migration. Comply with governing regulations pertaining to environmental protection.

Do not use water when it may create hazardous or objectionable conditions such as ice, flooding, and pollution.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION

3.1 PREPARATION

A. General: Cease operations and notify the Program Manager immediately if safety of structure appears to be endangered.

B. Cover and protect equipment and fixtures from dust, soilage or damage when

demolition work is performed in areas where such items have not been removed.

- C. Erect and maintain dust-proof partitions and closures as required to prevent spread of dust or fumes as directed under Section 1.4, Job Conditions.

Where selective demolition occurs immediately adjacent to occupied areas, or contractor's ability to control air borne dust to acceptable limits has failed, construct continuous dust-proof partitions consisting of minimum 4-inch studs, and heavy-duty poly sheeting.

Provide weatherproof closures for exterior openings.

- D. Locate, identify, stub off, and disconnect utility services that are not indicated to remain.

Provide bypass connections as necessary to maintain continuity of service to occupied areas of building. Provide minimum of 72 hours advance notice to Owner if shutdown of service is necessary during changeover.

3.2 DEMOLITION

- A. General: Perform selective demolition work in a systematic manner. Use such methods as required to complete work indicated on Drawings in accordance with demolition schedule and governing regulations.

Demolish concrete and masonry in small sections. Promptly remove debris to avoid imposing excessive loads on supporting floors or framing.

For interior slabs on grade, use removal methods that will not crack or structurally disturb adjacent slabs or partitions. Use power saw where possible.

If unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure both nature and extent of the conflict. Submit report to the Program Manager in written, accurate detail. Pending receipt of directive from the Program Manager, rearrange selective demolition schedule as necessary to continue overall job progress without undue delay.

3.3 SALVAGED MATERIALS

- A. Salvaged Items: Where indicated on Drawings as "Salvage - Deliver to Owner," carefully remove indicated items, clean, store, and turn over to Owner and obtain receipt.

Historic artifacts, including cornerstones and their contents, commemorative plaques and tablets, antiques, and other articles of historic significance, remain property of Owner. Notify Owner's Representative if such items are encountered and obtain acceptance regarding method of removal and salvage for Owner.

3.4 DISPOSAL OF DEMOLISHED MATERIALS

- A. Remove from site debris, rubbish, and other materials resulting from demolition operations. Transport and legally dispose off-site.

If hazardous materials are encountered during demolition operations, comply with applicable regulations, laws, and ordinances concerning removal, handling, and protection against exposure or environmental pollution.

Burning of removed materials is not permitted on project site.

3.5 CLEANUP AND REPAIR

- A. General: Upon completion of demolition work, remove tools, equipment, and demolished materials from site. Remove protections and leave interior areas broom clean.

Repair demolition performed in excess of that required. Return elements of construction and surfaces to remain to condition existing prior to start operations. Repair adjacent construction or surfaces soiled or damaged by selective demolition work.

END OF SECTION 01730

SECTION 01731

CUTTING AND PATCHING

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Bid Forms and Contract Requirements and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes procedural requirements for cutting and patching.
- B. Related Sections include the following:
 - 1. Division 1 Section "Selective Demolition" for demolition of selected portions of the building for alterations.
 - 2. Divisions 2 through 16 Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work.
 - a. Requirements in this Section apply to mechanical and electrical installations. Refer to Divisions 15 and 16 Sections for other requirements and limitations applicable to cutting and patching mechanical and electrical installations.

1.3 DEFINITIONS

- A. Cutting: Removal of existing construction necessary to permit installation or performance of other Work.
- B. Patching: Fitting and repair work required to restore surfaces to original conditions after installation of other Work.
- C.

1.4 SUBMITTALS

- A. Cutting and Patching Proposal: Submit a proposal describing procedures at least 10 days before the time cutting and patching will be performed, requesting approval to proceed. Include the following information:
 - 1. Extent: Describe cutting and patching, show how they will be performed, and indicate why they cannot be avoided.

2. Changes to Existing Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building's appearance and other significant visual elements.
3. Products: List products to be used and firms or entities that will perform the Work.
4. Dates: Indicate when cutting and patching will be performed.
5. Utilities: List utilities that cutting and patching procedures will disturb or affect. List utilities that will be relocated and those that will be temporarily out of service. Indicate how long service will be disrupted.
6. Structural Elements: Where cutting and patching involve adding reinforcement to structural elements, submit details and engineering calculations showing integration of reinforcement with original structure.
7. Engineers Approval: Obtain approval of cutting and patching proposal before cutting and patching. Approval does not waive right to later require removal and replacement of unsatisfactory work.

1.5 QUALITY ASSURANCE

- A. Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio.
- B. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that result in increased maintenance or decreased operational life or safety.
- C. Miscellaneous Elements: Do not cut and patch the following elements or related components in a manner that could change their load-carrying capacity that results in reducing their capacity to perform as intended, or that result in increased maintenance or decreased operational life or safety:
 1. Water, moisture, or vapor barriers.
 2. Membranes and flashings.
 3. Exterior wall construction.
 4. Equipment supports.
 5. Piping, ductwork, and equipment.
- D. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in Engineer's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

1. If possible, retain original Installer or fabricator to cut and patch exposed Work listed below. If it is impossible to engage original Installer or fabricator, engage another recognized, experienced, and specialized firm.
 - a. Precast concrete finishes.
 - b. Masonry.
 - c. Ornamental metal.
 - d. Preformed metal panels.
 - e. Roofing.
 - f. Window system.
 - g. Fluid-applied membranes.
 - h. HVAC enclosures, electrical cabinets, or covers.
- E. Cutting and Patching Conference: Before proceeding, meet at Project site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

1.6 WARRANTY

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

PART 2 PRODUCTS

2.1 MATERIALS

- A. General: Comply with requirements specified in other Sections of these Specifications.
- B. Existing Materials: Use materials identical to existing materials. For exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.
 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will match the visual and functional performance of existing materials.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine surfaces to be cut and patched and conditions under which cutting and

patching are to be performed.

1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Temporary Support: Provide temporary support of Work to be cut.
- B. Protection: Protect existing construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- C. Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.
- D. Existing Services: Where existing services are required to be removed, relocated, or abandoned, bypass such services before cutting to avoid interruption of services to occupied areas.

3.3 PERFORMANCE

- A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
 1. Cut existing construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Cutting: Cut existing construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
 1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 2. Existing Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
 3. Concrete: Cut using a cutting machine, such as an abrasive saw or a diamond core drill.
 4. Excavating and Backfilling: Comply with requirements in applicable Division 2 Sections where required by cutting and patching operations.

5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
 6. Proceed with patching after construction operations requiring cutting are complete.
- C. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections of these Specifications.
1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.
 2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
 3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove existing floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
 - a. Where patching occurs in a painted surface, apply primer and intermediate paint coats over the patch and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.
 4. Ceilings: Patch, repair, or re-hang existing ceilings as necessary to provide an even-plane surface of uniform appearance.
 5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weather tight condition.

END OF SECTION 01731

SECTION 01740

GUARANTEES / WARRANTIES AND BONDS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Bid Forms and Contract Requirements and other Division 1 Specification Sections, apply to this Section.

1.2 DESCRIPTION

- A. Requirements Included:
 - 1. Compile specified guarantees, warranties, bonds and certificates.
 - 2. Compile specified service and maintenance contracts.
 - 3. Co-execute submittals when so specified.
 - 4. Review submittals to verify compliance with Contract Documents.
 - 5. Submit for review and transmittal to Owner.

1.3 SUBMITTAL REQUIREMENTS

- A. Provide, list and assemble all guarantees, warranties, bonds, certificates and service and maintenance contracts, executed by the Contractor and each of the respective manufacturers, suppliers, and subcontractors.
- B. Number of original signed copies required: Two each.
- C. Table of Contents: Neatly typed, in orderly sequence. Provide complete information for each item. Product or work item. Firm, with name of principal, address and telephone number. Type and duration of guarantee or warranty.

1.4 FORM

- A. In addition to other requirements of the Contract Documents regarding the general one year warranty, as a condition preceding certifying final payment, the Contractor shall provide extended guarantees/warranties for certain work, as specified in the applicable Specification Sections, on the following form written on the Contractor's own letterhead. The guarantees/warranties shall commence on the Date of Final Acceptance of the Work of the last phase of each construction season, unless specifically indicated otherwise. Contractor shall issue one-year warranties for each construction season.

"Guarantee/Warranty for _____ (Phase or portion of work under warranty identified by Specification Section)

Project:

Address:

Date: _____ We hereby warrant and the Contractor guarantees that the _____ which we have installed in the _____ has been performed in accordance with the Drawings and Specifications and that the work as installed will fulfill the requirements of the guarantee/warranty included in the Specifications.

We agree to repair or replace any or all of our work, together with any or all other work which may be damaged or displaced by so doing, that may prove to be defective in its workmanship, materials, or failure to conform to Contract provisions and requirements within a period of one year from the Date of Final Acceptance of the above named project and project phases by the Owner without expenses whatever to the said Owner, ordinary wear and tear and unusual abuse or neglect excepted.

In the event of our failure to comply with the foregoing conditions within 10-days after being notified in writing by the Owner, we collectively or separately do hereby authorize the Owner to proceed to have said defects repaired and made good at our expense and we will honor and pay the costs and charges therefore upon demand.

Signed: _____ Date: _____
(Contractor)

Or

Signed: _____ Date: _____
(Subcontractor)

Countersigned: _____ Date: _____
(Contractor)

Include the following if specified:

Countersigned: _____ Date: _____

1.5 CORRECTION OF GUARANTEED/WARRANTED WORK

- A. Unless repair is agreed to by Owner, Contractor shall correct failed work by removal and replacement of the failed portions with new materials.
- B. In connection with Contractor's correction of warranted work which has failed, remove and replace other work of Project which has been damaged as a result of such failure, or which must be removed and replaced to provide access for correction of warranted work.
- C. Except as otherwise indicated or required by governing regulations, special Project warranties and product warranties are not extended to cover damage to building contents (other than work of Contract) which occurs as a result of failure of warranted work.
- D. Except as otherwise indicated, when work covered by a special Project warranty or product warranty has failed and has been corrected by replacement or restoration, reinstate warranty by written endorsement for the specified time period, starting on date of acceptance of replaced or restored work.
- E. Except as otherwise indicated, costs of replacing or restoring failing warranted units or products is Contractor's obligation, without regard for whether Owner has already benefited from use through a portion of anticipated useful service lives.
- F. Do not purchase, subcontract for, or allow others to purchase or sub-subcontract for materials or units of work for Project where a special Project warranty, specified product warranty, certification or similar commitment is required, until it has been determined by the Contractor that entities required to countersign such commitments are willing to do so.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

END OF SECTION 01740

SECTION 01770

CLOSEOUT PROCEDURES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Bid Forms and Contract Requirements and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
 - 1. Inspection procedures.
 - 2. Project Record Documents.
 - 3. Operation and maintenance manuals.
 - 4. Warranties.
 - 5. Instruction of Owner's personnel.
 - 6. Final cleaning.
- B. Related Sections include the following:
 - 1. Division 1 Section "Payment Procedures" for requirements for Applications for Payment for Substantial and Final Completion.
 - 2. Division 1 Section "Construction Progress Documentation" for submitting Final Completion construction photographs and negatives.
 - 3. Division 1 Section "Photographic Documentation" for submitting Final Completion construction photographs and negatives.
 - 4. Divisions 2 through 16 Sections for specific closeout and special cleaning requirements for products of those Sections.

1.3 COMPLETION BY PHASE

- A. Procedures: Before requesting inspection for determining date of Completion and Acceptance by Phase:
 - 1. Prior to the Contractor's demobilization from a project phase, Contractor shall notify Engineer at least seven days advance of completion of work.
 - 2. Engineer shall review work completed for defect, incompleteness, workmanship and final cleanup for determination of completeness. Engineer will notify Contractor of completed state or additional items identified by Engineer that must be completed or corrected before acceptance.

- a. Re-inspection: Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.
3. Upon notification from Engineer of completion, Contractor shall remove temporary barricades, signs, controls and facilities. Contractor shall release phase area for Owner's use.

1.4 FINAL COMPLETION

- A. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:
 1. Submit a final Application for Payment according to Division 1 Section "Payment Procedures."
 2. Comply with Engineer's completion inspection list of items to be completed or corrected (punch list) for the final phase.
 3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
 4. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration, training programs and any training videotapes.

1.5 PROJECT RECORD DOCUMENTS

- A. General: Do not use Project Record Documents for construction purposes. Protect Project Record Documents from deterioration and loss. Provide access to Project Record Documents for Engineer's reference during normal working hours.
- B. Record Drawings: Maintain and submit one set of blue- or black-line white prints of Contract Drawings and Shop Drawings.
 1. Mark Record Prints to show the actual installation and repair locations.
 - a. Give particular attention to information on concealed elements that cannot be readily identified and recorded later.
 - b. Accurately record information in an understandable drawing technique.
 - c. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.
 - d. Mark Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely and accurately. Where Shop Drawings are marked, show cross-reference on Contract Drawings.
 2. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at the same location.

3. Mark important additional information that was either shown schematically or omitted from original Drawings.
 4. Note Construction Change Directive numbers, Change Order numbers, alternate numbers, and similar identification where applicable.
 5. Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location. Organize into manageable sets; bind each set with durable paper cover sheets. Include identification on cover sheets.
- C. Record Product Data: Submit one copy of each Product Data submittal. Mark one set to indicate the actual product installation where installation varies substantially from that indicated in Product Data.
1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
 3. Note related Change Orders, Record Drawings, where applicable.
- D. Miscellaneous Record Submittals: Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

1.6 OPERATION AND MAINTENANCE MANUALS

- A. Assemble a complete set of operation and maintenance data indicating the operation and maintenance of each system, subsystem, and piece of equipment not part of a system. Include operation and maintenance data required in individual Specification Sections and as follows:
1. Operation Data:
 - a. Emergency instructions and procedures.
 - b. System and equipment descriptions, including operating standards.
 - c. Operating procedures, including startup, shutdown, seasonal, and weekend operations.
 - d. Description of controls and sequence of operations.
 2. Maintenance Data:
 - a. Manufacturer's information, including list of spare parts.
 - b. Name, address, and telephone number of Installer or supplier.
 - c. Maintenance procedures.
 - d. Maintenance and service schedules for preventative and routine maintenance.
 - e. Maintenance record forms.
 - f. Sources of spare parts and maintenance materials.
 - g. Copies of maintenance service agreements.

- h. Copies of warranties.
- B. Organize operation and maintenance manuals into suitable sets of manageable size. Bind and index data in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, with pocket inside the covers to receive folded oversized sheets. Identify each binder on front and spine with the printed title "OPERATION AND MAINTENANCE MANUAL," Project name, and subject matter of contents. Provide one electronic copy of the Operation and Maintenance manual in PDF (Portable Document Format) transmitted on CD and electronic file transfer.

1.7 WARRANTIES

- A. Submittal Time: Submit written warranties on request of Engineer for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.
- B. Partial Occupancy: Submit properly executed warranties within 15 days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.
- C. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.
 - 1. Bind warranties and bonds in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8- 1/2-by-11-inch paper.
 - 2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
 - 3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.
- D. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning

agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 EXECUTION

3.1 DEMONSTRATION AND TRAINING

- A. Instruction: Instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
 - 1. Provide instructors experienced in operation and maintenance procedures.
 - 2. Provide instruction at mutually agreed-on times. For equipment that requires seasonal operation, provide similar instruction at the start of each season.
 - 3. Schedule training with Owner with at least seven days' advance notice.
 - 4. Coordinate instructors, including providing notification of dates, times, length of instruction, and course content.
- B. Program Structure: Develop an instruction program that includes individual training modules for each system and equipment not part of a system, as required by individual Specification Sections. For each training module, develop a learning objective and teaching outline. Include instruction for the following:
 - 1. System design and operational philosophy.
 - 2. Review of documentation.
 - 3. Operations.
 - 4. Adjustments.
 - 5. Troubleshooting.
 - 6. Maintenance.
 - 7. Repair.

3.2 FINAL CLEANING

- A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
 - 1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:

- a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas of rubbish, waste material, litter, and other foreign substances.
- b. Sweep paved areas broom clean.
- c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
- d. Remove tools, construction equipment, machinery, and surplus material from Project site.
- e. Remove snow and ice to provide safe access to building.
- f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
- g. Remove debris and surface dust from limited access spaces, including roofs, equipment, manholes, and similar spaces.
- h. Sweep concrete floors broom clean in unoccupied spaces.
- i. Clean transparent materials, including windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Clean and polish glass, taking care not to scratch surfaces.
- j. Remove labels that are not permanent.
- k. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.
 - 1) Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.
- l. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
- m. Replace parts subject to unusual operating conditions.
- n. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
- o. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs, and those noticeably dimmed by hours of use, and defective and noisy starters to comply with requirements for new fixtures.
- p. Leave Project clean and ready for occupancy.

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

END OF SECTION 01770

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Manchester • Boston Regional Airport Project Documents

City of Manchester - Department of Aviation

Division 02: TECHNICAL SPECIFICATIONS

FY22-805-50

**PARKING GARAGE: LEVEL-4 FLOOR & LEVEL-3 CEILING
SEALANTS, WATERPROOFING, & MISCELLANEOUS REPAIRS**



APRIL 2022

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SECTION 02000

WORK ITEM SCOPES

1. GENERAL REQUIREMENTS

1.1 General Requirements – Mobilization and Supplementary General Conditions

A. Scope of Work

This section shall include the work required to be performed by the General Contractor as indicated in the Contract documents and drawings as Work Item 1.1 General Requirements – Mobilization and Supplementary General Conditions (Work Item 1.1) and shall be bid as a Lump Sum (LS) amount. This work shall include but not be limited to: mobilization, demobilization, and supplementary general conditions such as, shop drawings, miscellaneous dust control or safety protection barriers, traffic control, construction appurtenances as necessary to perform the work, and all other labor and material necessary to facilitate the construction activities, but not indicated as included in a separate Work Item on the Bid Form or on the Plans or Specifications.

1. Work Item 1.1 shall also include all work incidental to, and as described in Subsections 1.1.1, 1.1.2, and 1.1.3.
2. Miscellaneous Subsidiary Work to be included in Work Item 1.1 shall consist of any temporary or permanent work which must be accomplished to facilitate the Contractor's means and methods, and the completion of the overall project.
3. Contractor shall maintain As-Built Drawings on-site reflecting repair locations, modifications, and applications of new materials, with dimensions and appropriate information, clearly noted (in color ink) to describe and delineate the complete extent of the work performed. The Contractor shall submit one (1) photocopy set of As-Built / Record Status drawings to the Engineer for record at the end of each phase, and with monthly pay applications for repairs work.

B. Products

1. Products and materials provided for work under Mobilization and Supplementary General Conditions that are not specifically identified in the Contract Documents, shall be in accordance with applicable Codes, ASTM and other Materials Standards, The Manual of Uniform Traffic Control Devices, O.S.H.A., and general construction industry standard practices.

C. Procedures

Work provided under Mobilization and Supplementary General Conditions shall be paid on a lump sum basis in accordance with the following:

1. Initial partial payment requisition may be submitted as soon as one week after site mobilization provided work has begun to progress and may include up to 25 percent of the lump sum amount in the bid for Mobilization and Supplementary General Conditions.
2. Subsequent partial payment requisitions submitted with amounts for Mobilization and Supplementary General Conditions may include payment of a portion of the remaining balance of the supplementary general conditions lump sum amount, which shall be proportional to the amount of progress of the work as determined by the Engineer.
3. Should reasonable evidence exist that the Contractor is responsible for defective work, third party claim, failure to make Subcontractor payments properly, remaining work cannot be completed for the unpaid balance, damage to Owner, or work will not be completed within the Contract time, Engineer may as necessary to protect the Owner from loss, withhold a certificate of payment or portion thereof.

Prior to mobilization to the site, the Contractor shall submit a copy of a project-specific Safety Plan for the Airport's reference and file in accordance with Specification Section 01545

1.1.1 General Conditions – Work Zone Capture – Barricades & Temporary Construction Signage

- A. Scope of Work: Work Item 1.1 shall include all coordination, labor, materials, signage, and miscellaneous incidental work as required to facilitate the construction and vehicle and pedestrian traffic control, unless otherwise specifically noted herein or on the plans to be provided by the Owner in certain areas.
 1. The Owner will close the Level-4 and Level-3 Work Areas and Safety Areas prior to the start of construction operations for vehicle clearance by attrition and will provide and erect temporary barricades at the entrances from the helix ramps and the stair towers and half-floor work area isolation (barrels and ropes) as shown on the Plans. The Contractor shall coordinate and perform construction activities in a phased manner as necessary to allow public access through the work areas, when directed by the Owner and as indicated on the Plans, to the other half of a floor on both parking levels and to protect the general public and publicly accessible areas from exposure to work-related hazards.

2. The Contractor shall provide all additional barricades, traffic control devices, and/or warning signage in and around the work zones as may be incidentally or temporarily required in addition to that shown on the plans, to facilitate the safe performance of his work in all areas at no additional cost to the Owner, and subject to the approval by the Owner's Representative/Engineer.
3. The barricades, floor opening coverings, and other vehicle and pedestrian safety measures as appropriate for the Drive Bay Jointline Replacement Work Areas are not indicated on the Plans. The Contractor shall provide supplementary localized work area captures and safety area captures (below) and protection as necessary for the work and public safety. Capture areas on Level-4 and on Level-3 below the work shall be delineated with orange cones (30" tall minimum) and/or orange construction barrels, yellow rope and danger construction area (and/or overhead work) signs as appropriate and approved by the Owner's Representative/Engineer.
4. The Contractor shall install rigid and secure floor opening closures / coverings at all of the building column penetrations through the floor inside, and adjacent to, the entire (phased) work area on Level-3 floor as required to prevent dust and debris (from overhead concrete demolition, abrasive blasting, material applications, and other work) from falling/migrating to the occupied public parking level below. The Closures may be fabricated from wood, thick rigid-insulation board, or other material as proposed by the Contractor and approved by the Engineer/Owner. The floor opening closures shall be checked daily by the Contractor for stability and serviceability, with special attention in active work locations. Damage or injury from errant dust or debris that falls onto vehicles or pedestrians on Level-2 below shall be the Contractor's sole responsibility.
5. The Contractor shall furnish and install standard commercially available 12"x12" (not custom fabricated) "Danger – Construction Area" and/or Danger – Do Not Enter" warning signage at approximately 25 foot spacing around the work area(s) perimeter as directed by the Owner/Engineer and as required to sufficiently warn the general public of potentially hazardous areas and overhead work.
6. The Contractor shall meet with the Owner's Representative/Engineer onsite no later than 5 days prior to starting work in the captured areas to review and confirm that the erected work zone protection barricades, traffic control, and signage, are appropriate and sufficient to the Contractor and to the Owner for protection of the Contractor's work zones and safety of the general public.
7. The Contractor shall notify the Owner's Representative / Engineer at least

48 hours prior to performing any work that will require a modification to the established work zone barricades or signage as erected to protect the work and the general public.

8. The Contractor shall perform daily verifications of all barricades and signage prior to the start of each working day and at the end of each working day to ensure barricades and signage are in place and that the Contractor's work zone and the general public is protected in accordance with subsection C. Procedures.

B. Products

1. All miscellaneous materials and products provided for the Work included herein shall be of commercial and/or industrial grade and in conformance with sound construction industry standards as described in Subsection 1.1.B.

C. Procedures

1. The Contractor shall maintain a written record with the name/date/time of the superintendent or foreman who performs the daily barricade and signage checks at the start and end of each day.
2. The Contractor shall immediately notify the Engineer or the Owner's Representative upon any observation of any unauthorized change in condition of the work zone capture and vehicular and pedestrian traffic control barricades and signage, and the observer shall then correct the undesirable condition immediately if possible, to avoid any delay of work or unsafe condition.

1.1.2 General Conditions –Flagmen

A. Scope of Work

1. Work Item 1.1 shall also include all labor and materials required to post flagmen as needed to facilitate the Contractors operations or as directed in the field by the Owner or Engineer. These flagmen shall direct pedestrians and vehicular traffic as required to maintain safe public access and isolation of construction activity areas outside of the normal work zone limits if required by the Contractor's operations or work plans.

2. This item includes Incidental Task Flagmen that may be required to facilitate short duration miscellaneous construction activities such as material deliveries/lay-down, equipment deliveries, debris removal, temporary construction barricade removal and replacements, etc. All Anticipated and Incidental Task Flagmen shall be included in the general conditions under Work Item 1.1.

B. Products

1. All flagmen furnished under this Work Item shall be appropriately trained and have prior traffic flagging experience.
2. Each posted flagman shall be equipped with hardhat, reflective traffic safety vest, flashlight (in dim light conditions). Standard “Flagman Ahead” roadway warning sign, and standard 2-sided stop/slow sign shall be provided when appropriate in the judgment of the Owner’s Representative / Engineer.
3. Contractor to appropriately place warning signs for vehicles approaching flagman locations and any other safety measures necessary to adequately protect flagmen, pedestrians, and vehicular traffic.
4. Temporary relief flagmen for continuous duty posts will be subject to the same requirements as the primary flagman.

C. Procedures

1. All Flagmen shall be orientated to the site and adequately informed of the on-going construction operations and the traffic control requirements prior to posting.

1.1.3 General Conditions – Cleaning and Miscellaneous Subsidiary Work

A. Scope of Work

1. Work Item 1.1 shall also include all labor, materials, and disposal, required to provide all interim and final cleaning of work areas including but not limited to:
 - a. Work areas shall be kept continuously free of packaging materials and other debris that may become wind-blown across the garage and become lodged in the sidewall screens or displaced outside of the garage which may then become Airfield Foreign Object Debris (FOD). FOD may present a hazard to operating Aircraft and the Contractor will be held responsible for damage resulting from FOD originating from this project.

- b. Dust control during construction operations shall be provided by the Contractor as required to minimize fugitive wind-blown dust from exiting the garage, or from coating the adjacent facilities and parked vehicles. The Contractor will be required to clean significant dust residue resulting from the work in adjacent areas, as determined by the Owner's Representative / Engineer, including but not limited to glazing, lighting fixtures, doors, railing, etc. The Contractor shall halt construction operations creating heavy wind-blown dust conditions upon direction of the Owner's Representative / Engineer until conditions can be controlled and any resulting work delays shall not be the basis of claim for a contract change order.
 - c. Cleaning of the floor, floor drain baskets, and expansion joint glands in the work areas and affected adjacent areas, as directed by the Engineer on Level-4 and Level-3 shall be subsidiary to the overall project mobilization and shall not be measured or paid for separately.
 - d. Floor drains shall be protected with geotextile filter fabric and/or screening, as approved by the Engineer, during all operations that create dust and small debris that may be washed across the floor areas and enter the drains and accumulate in the drain piping. The floor areas shall be cleaned of heavy dust and debris on a daily basis and before impending rain events to prevent windblown debris or migration into the drainage system.
 - e. If required by the Engineer, localized areas or the entire floor area shall be cleaned as necessary including surface grinding, power-broom, air blast, power washing, solvent wipe, and/or abrasive media brush blasting to provide final floor surface cleanliness as appropriate for the application of pavement marking paint (by Owner) as approved by the Engineer. The Contractor shall power wash the entire floor, including column shafts, beams, and/or other surfaces that may have accumulated construction dust/laitance, on each work area after completion of concrete patching and miscellaneous repairs and before shot blasting of the deck is performed for penetrating sealer surface preparation.
2. Work Item 1.1 shall also include provision of access to overhead work for the Engineer and/or Owner's use:
- a. The Contractor shall provide one (1) spare single-level rolling 6-foot-tall x 6-foot-long x 2.5-foot-wide (professional grade Baker Type) scaffold to remain onsite for dedicated daily use by the Engineer and/or Owner to be utilized as needed for observing the elevated ceiling repairs work. The Contractor shall keep the scaffold clean and in good working condition including wheel locks and 1,000 lb. capacity locking adjustable deck.

- b. The Contractor shall deliver, set up, maintain, and secure the scaffold in the work area during and outside of working hours. The Owner nor Engineer shall not be held responsible for damage to, or loss of, the scaffold while it is at the project site.

B. Products

1. All materials and products provided for the Work included herein shall be of commercial and/or industrial grade and in conformance with sound construction industry standards as described in Subsection 1.1.B.

C. Procedures

1. All Cleaning and Miscellaneous Subsidiary Work shall be performed in accordance with sound construction industry standards and practices.

2 FLOOR REPAIRS

2.1 Floor Repair – Full Depth at C.I.P Concrete Wash - Drive Bays

A. Scope of Work

Work Item 2.1 Floor Repair – Full Depth at C.I.P. Concrete Wash – Drive Bays consists of the work shown in Drawing Detail 2.1 and shall include all incidental and necessary provisions to complete the work associated with Work Item 2.1 including:

1. Locating, marking, and reviewing with Engineer areas to be repaired.
2. Sawcut perimeter and removal and proper disposal of deteriorated and removed materials.
1. Preparation of exposed concrete cavities and surfaces of existing steel reinforcement and steel embedments including subsidiary abrasive media blasting and the subsidiary application of epoxy protective coating on reinforcing steel, steel embedments, and cavity bonding agents as directed by the Engineer.
3. Replacing and/or supplementing deteriorated or removed reinforcing bars with new reinforcing steel where required shall be subsidiary to Work Item 2.1.
4. Measuring prepared cavities with Engineer for Payment Application. Contractor shall photograph and prepare a field sketch of the prepared repair areas as approved by the engineer for record and payment purposes. Payment shall be made on a Square Foot basis.

5. Mixing, applying, and curing repair materials.
6. Restoring the repaired areas for use by Owner.
7. Pavement Markings will be installed by the Owner.

B. Products

1. Materials to be utilized for the repair shall conform to Specification Section 03732.
2. Repair mortar shall be compatible with galvanic corrosion protection anodes installed under Work Item 3.8.

C. Procedures

1. Repair shall be as specified on the Plans and in Specification Section 03732.
2. Submit product data as required by Specification Section 03732.

2.2 Floor Repair – Partial Depth at C.I.P. Concrete Wash

A. Scope of Work

Work Item 2.2 Floor Repair – Partial Depth at C.I.P. Concrete Wash consists of the work shown in Drawing Detail 2.2 and shall include all incidental and necessary provisions to complete the work associated with Work Item 2.2 including:

2. Locating, marking, and reviewing with Engineer areas to be repaired.
3. Removal and proper disposal of deteriorated and removed materials.
4. Preparation of exposed concrete cavities and surfaces of existing steel reinforcement and steel embedments including subsidiary abrasive media blasting and the subsidiary application of epoxy coating on reinforcing steel and/or cavity bonding agents as directed by the Engineer.
5. Measuring prepared cavities with Engineer for Payment Application. Contractor shall prepare a field sketch of the prepared repair areas as approved by the engineer for record and payment purposes. Payment shall be made on a Square Foot basis.
6. Mixing, applying, and curing repair materials.

7. Restoring the repaired areas for use by Owner.
8. Pavement Markings will be installed by the Owner.

B. Products

1. Materials to be utilized for the repair shall conform to Specification Section 03732.

C. Procedures

1. Repair shall be as specified on the Plans and in Specification Section 03732.
2. Submit product data as required by Specification Section 03732.

2.3 Floor Repair - Partial Depth at Precast Concrete Floor Slab

A. Scope of Work

This work consists of removal of deteriorated, chipped / spalled precast concrete in various size areas, Typical As Required (T.A.R.) throughout the work zone, and the application of patching materials as shown on the plans in Drawing Detail 2.3 and shall include all incidental and necessary provisions to complete the work associated with Work Item 2.3 including:

1. Reviewing all areas to be repaired with the Engineer prior to commencement of work. Repair areas will be located and marked by the Engineer.
2. Remove existing damaged and unsound concrete with neat sawcut edge lines.
3. Preparation of exposed concrete cavities and surfaces of existing steel reinforcement and steel embedments including subsidiary abrasive media blasting and the subsidiary application of epoxy coating on reinforcing steel and/or cavity bonding agents as directed by the Engineer.
4. Prepare areas for Cementitious Repair Mortar materials as required by the details on the plans, as recommended by the repair mortar manufacturer, and as directed by the Engineer. Measure and record the prepared areas on the record plans for square-foot basis of payment.
5. Allow sufficient curing time of patch material prior to application of traffic coatings, as recommended by the traffic coating manufacturer.
6. Restoring the repaired areas for use by Owner.

7. Pavement Markings will be installed by the Owner.

B. Products

1. Cementitious Repair Mortar materials to be utilized for the repair shall conform to Specification Section 03732.

C. Procedures

1. Repair shall be as specified in Specification Section 03732.
2. Submit product data as required by Specification Section 03732.

2.4 Floor Repair – Not Used

2.5 Floor Repair – Not Used

2.6 Floor Repair – Floor Repair – Traffic Topping – Pedestrian Grade

A. Scope of Work

This work consists of applying New Traffic Topping (Work Item 2.6) on precast concrete areas or cast-in-place concrete areas and shall include all incidental and necessary provisions to complete the work as indicated on the Plans and as directed by the Engineer.

This work shall include all necessary provisions and incidental tasks and materials to complete the Work Item, including but not limited to:

1. Locating, and reviewing with the Engineer all areas to receive Traffic Topping.
2. Preparing areas to receive Traffic Topping according to manufacturer's recommendations and Specifications Section 07180, which will include steel-shot blasting and/or abrasive aggregate blasting as applicable and as approved by the Engineer.
3. Removal and replacement of joint and crack sealants within the new traffic topping areas shall be performed prior to application of traffic topping coatings as directed.
4. Application of sealant to form a smooth continuous traffic topping transition over joints/cracks or minor concrete edge irregularities shall be included as subsidiary in areas not designated for sealants under another Contract Item.

5. Provide minimum 4” wide detail coat of base coat material (membrane) over all joint and crack sealants.
6. Measuring prepared areas with Engineer for Payment Application. Payment shall be made on a Square Foot basis.
7. Apply Traffic Topping over designated concrete areas.
8. Restoring the repaired areas for use by the Owner.

B. Products

1. Materials to be utilized shall conform to Specification Sections 07180.

C. Procedures

1. Application of traffic topping shall be as specified in Specification Sections 07180.
2. Submit product data as required by Specification Sections 07180.
3. Contractor to submit As-Built plans of areas receiving any Traffic Toppings and shall indicate quantities of each type of Traffic Topping.

2.7 Floor Repair – Traffic Topping Coatings – Vehicular Grade

2.7A Floor Repair – Traffic Topping – Full Membrane System

A. Scope of Work

Work Item 2.7A Floor Repair – Traffic Topping – Full Membrane System consists of applying New Traffic Topping (Work Item 2.7A) on precast concrete floor areas or cast-in-place concrete wash areas and shall include all incidental and necessary provisions to complete the work as indicated on the Plans and as directed by the Engineer.

This work shall include all necessary provisions and incidental tasks and materials to complete the Work Item, including but not limited to:

1. Locating, and reviewing with the Engineer all areas to receive Traffic Topping.
2. Preparing areas to receive Traffic Topping according to manufacturer’s recommendations and Specifications Section 07180, which will include steel-shot blasting and/or abrasive aggregate blasting as applicable and as approved

by the Engineer.

3. Removal and replacement of joint and crack sealants within the new traffic topping areas shall be performed prior to application of traffic topping coatings as directed.
4. Application of sealant to form a smooth continuous traffic topping transition over joints/cracks or minor concrete edge irregularities shall be included as subsidiary with Work Item 2.7A.
5. Provide minimum 4" wide detail coat of base coat material (membrane) over all joint and crack sealants.
6. Measuring prepared areas with Engineer for Payment Application. Payment shall be made on a Square Foot basis.
7. Apply Traffic Topping or Traffic Topping Repair over floor slab areas.
8. Restoring the repaired areas for use by the Owner.

B. Products

2. Materials to be utilized shall conform to Specification Sections 07180.

C. Procedures

4. Application of traffic topping shall be as specified in Specification Sections 07180.
5. Submit product data as required by Specification Sections 07180.
6. Contractor to submit As-Built plans of areas receiving any Traffic Toppings and shall indicate quantities of each type of Traffic Topping.

2.7B Floor Repair – Traffic Topping – Wearcoat and UV TopCoat

A. Scope of Work

Work Item 2.7B Floor Repair – Traffic Topping – Wearcoat and UV TopCoat consists of applying Traffic Topping Wearcoat and Topcoat (Work Item 2.7B) on top of prepared existing traffic coatings on precast concrete floor areas of cast-in-place concrete wash areas and shall include all incidental and necessary provisions to complete the work as shown on the Plans and as directed by the Engineer, and shall

include all necessary provisions to complete the work associated with Work Item 2.7B.

This work shall include all necessary provisions and incidental tasks and materials to complete the Work Items, including but not limited to:

1. Locating, marking, and reviewing with the Engineer all areas to receive Traffic Topping.
2. The Contractor shall inspect all areas of the existing coating to receive Item 2.7B and shall identify and mark any areas of failed existing coatings or delaminated concrete below the coating and review with the Engineer prior to performing any work. Removal and replacement of failed existing traffic coatings within the new traffic topping areas shall be performed prior to application of traffic topping coatings as directed by the Engineer and will be subsidiary under the appropriate related items including Work Item 2.2, 2.3, 2.7A, and 2.7J.
3. Preparing areas to receive Traffic Topping or Traffic Topping UV TopCoat according to manufacturer's recommendations, which will include subsidiary pressure wash cleaning, solvent wipe, and/or abrasive brush-blasting as applicable and as recommended by the coating manufacturer or as directed by the Engineer.
4. Measuring prepared areas with Engineer for Payment Application. Payment shall be made on a Square Foot basis.
5. Apply Traffic Topping on prepared areas.
6. Restoring the repaired areas for use by Owner.

B. Products

1. Materials to be utilized shall conform to Specification Sections 07180.
2. Materials for Item 2.7B shall match the existing coating material (manufacturer and products) in the subject areas as indicated on the Plans or as pre-accepted in writing by the proposed coating manufacturer for overlay adhesion warranty and approved by the Engineer.

C. Procedures

1. Application of traffic topping shall be as specified in Specification Sections 07180.
2. Submit product data as required by Specification Sections 07180.

3. Contractor to submit As-Built plans of areas receiving any Traffic Toppings and shall indicate quantities of each type of Traffic Topping.

2.7H-R Floor Repair – Traffic Topping – Membrane Repairs – Helix

A. Scope of Work

This work consists of applying New Traffic Topping for the repair of the existing system (**Work Item 2.7H-R**) on cast-in-place concrete and existing traffic coating areas as directed by the Engineer, Typical As Required in the Entrance and/or Exit Helix (on any floor level) as shown on the details in the Plans and as directed by the Engineer.

The work also includes inspecting and marking the areas with the Engineer and removal of the exiting failed coatings within the limits designated. Full multi-coat application of the Traffic Topping coatings system shall be installed under Work Item 2.7H-R on identified areas of existing traffic coating that are damaged or have failed will require full depth membrane repairs.

The location of some repair areas may inhibit the use of the Entrance or Exit helix by vehicular traffic during application and/or curing. The application of coatings in those areas shall be performed during night hours soon after last flight arrival. Working times and flight schedule to be coordinated with the Owner. Surface preparations in those areas may be performed during daytime hours provided that appropriate traffic control and safety precautions are employed. Night work differential shall be subsidiary to the overall work under Item 1.1 and/or Item 2.7H-R.

This work shall include all necessary provisions and incidental tasks and materials to complete the Work Items, including but not limited to:

1. Locating, marking, and reviewing with Engineer areas to receive Traffic Topping and Traffic Topping Repairs as applicable.
2. The Contractor shall inspect all areas of the existing coating to receive wearcoat and shall identify and mark any areas of failed existing coatings and review with the Engineer prior to performing any related work. Removal and replacement of failed existing traffic coatings within the new traffic topping areas shall be performed prior to application of traffic topping coatings wearcoat as directed by the Engineer and will be performed and paid under the appropriate related items including Work Item 2.7H-R.
3. Preparing areas to receive Traffic Topping or Traffic Topping according to manufacturer's recommendations which will include surface grinding and/or steel-shot or abrasive blasting as directed by the Engineer and in accordance

with Specification Section 07180.

4. Removal and replacement of any deteriorated underlying joint and crack sealants within the traffic topping repairs areas shall be performed prior to application of traffic topping coatings as directed by the Engineer and paid under Work Items 5.3 or 5.6 as applicable.
5. Measuring prepared areas with Engineer for Payment Application. Payment shall be made on a Square Foot basis.
6. Apply Traffic Topping system repair over concrete floor slab areas consisting of primer, membrane, and tow wear coats to match the existing system.
7. Restoring the repair areas and work areas for use by Owner.

C. Products

1. Materials to be utilized shall conform to Specification Sections 07180.

D. Procedures

1. Application of traffic topping and sealants shall be as shown on Detail 2.7H-R on the Plans and as specified in Specification Sections 07180.
2. Submit product data as required by Specification Sections 07180.
3. Contractor to submit As-Built plans of areas receiving any Traffic Toppings and shall indicate quantities of each type of Traffic Topping.

2.7H-T Floor Repair – Traffic Topping – Wearcoat & UV Topcoat - Hellix

A. Scope of Work

This work consists of applying New Traffic Topping Wearcoat and UV-stable Topcoat (Work Item 2.7H-T) on existing traffic coating areas in the Exit Helix as shown on the Plans and as directed by the Engineer.

Areas of existing traffic coating membrane that are damaged or have failed will require full depth membrane repairs to be performed under Work Item 9.5 – Field Item Allowance.

This work shall include all necessary provisions and incidental tasks and materials to complete the Work Items, including but not limited to:

1. Locating, marking, and reviewing with Engineer areas to receive Traffic

Topping and Traffic Topping Repairs as applicable.

2. The Contractor shall inspect all areas of the existing coating to receive wearcoat and shall identify and mark any areas of failed existing coatings and review with the Engineer prior to performing any related work. Removal and replacement of failed existing traffic coatings within the new traffic topping areas shall be performed prior to application of traffic topping coatings wearcoat as directed by the Engineer and will be performed and paid under the appropriate related items including Work Item 2.7H-R.
3. Preparing areas to receive Traffic Topping or Traffic Topping Top Coat according to manufacturer's recommendations and Specification Section 07180.
4. Measuring prepared areas with Engineer for Payment Application. Payment shall be made on a Square Foot basis.
5. Apply Traffic Topping or Traffic Topping over existing traffic topping areas.
6. Restoring the work areas for use by Owner.

B. Products

1. Materials to be utilized shall conform to Specification Sections 07180.

C. Procedures

2. Application of traffic topping and sealants shall be as shown on the Plans and as specified in Specification Sections 07180.
3. Submit product data as required by Specification Sections 07180.
4. Contractor to submit As-Built plans of areas receiving any Traffic Toppings and shall indicate quantities of each type of Traffic Topping.

2.7J Floor Repair – Nylon Reinforced Traffic Topping (1ft wide) at Jointline Precast Tee-to-Tee Flange

A. Scope of Work

Work Item 2.7J Floor Repair – Nylon Reinforced Traffic Topping (1ft wide) at Jointline Precast Tee-to-Tee Flange consists of applying new Traffic Topping (Work Item 2.7J) on precast concrete floor areas above the jointlines located along the edges of the precast concrete Double-Tee floor elements of the parking garage, and any additional incidental areas as directed by the Engineer. Work Item 2.7J shall be installed as shown on the Plans in Detail 2.7J and as described in Specifications

Section 07180 and shall include all necessary provisions and incidental items required to complete the work associated with Work Item 2.7J.

This work shall include all necessary provisions and incidental tasks and materials to complete the Work Items, including but not limited to:

1. Locating, and reviewing with the Engineer all areas to receive Traffic Topping.
2. Preparing areas to receive Traffic Topping according to the coating manufacturer's recommendations, which may include abrasive brush blasting or steel-shot blasting of the application surface, concrete saw-cutting of the coating application termination lines, and solvent wipe (xylene or other solvent approved by the Coating Manufacturer) of the joint materials or elastomeric sealants in the jointlines below the application areas as directed by the Engineer. Removal and surface preparations for localized areas of existing Nylon Reinforced Traffic Topping (1ft wide) at Jointline Precast Tee-to-Tee Flange that are to be replaced as noted on the plans and/or as directed by the Engineer shall be subsidiary to the overall work under Work Item 2.7J and Work Item 1.1.
3. Removal and replacement of joint and crack sealants within the new traffic topping areas shall be performed prior to preparations for traffic topping coatings as directed and paid under the appropriate related Work Items.
4. Application of the minimum 8" wide detail base coat (membrane) shall form a smooth continuous traffic topping membrane transition over the jointlines by filling any recess depression or minor slab edge irregularities and shall be included as subsidiary under Work Item 2.7J. The 6" wide nylon reinforcement strip shall be placed and back-rolled into the wet detail base coat application.
5. Apply full Traffic Topping system (membrane/base coat, intermediate/wear coats with sand, and finish/topcoat) over the cured detail base coat and embedded nylon fabric in the 1'-0" wide floor slab areas.
6. Measuring applied areas with Engineer for Payment Application. All Item 2.7J areas shall be taken as 12" wide for final pay unit measurement and no provision for over-width application will be made. Payment shall be made on a SQUARE FOOT basis.
7. Restoring the repaired areas for use by Owner.

B. Products

1. Materials to be utilized shall conform to Specification Sections 07180.

2. Materials for Item 2.7J shall be of the same manufacturer and product lines (as applicable, recommended, and approved) as the coating materials for Items 2.7A and 2.7B.

C. Procedures

1. Application of traffic topping shall be as shown on Detail 2.7J and as specified in Specification Sections 07180.
2. Submit product data as required by Specification Sections 07180.
3. Contractor to submit As-Built plans of areas receiving any Traffic Toppings which shall indicate quantities of Traffic Topping applied in those areas.

2.8 Floor Repair - Penetrating Concrete Sealer with Migrating Corrosion Inhibitor (MCI)

A. Scope of Work

This work consists of applying a Penetrating Concrete Sealer with Migrating Corrosion Inhibitor (MCI) to all of the precast concrete floor areas that are not currently covered by, or designated to receive, traffic toppings as designated by the Engineer. This Work Item is not represented by a detail on the repair details drawings and shall be in accordance with provisions of Section 07190 and the product manufacturer's recommendations.

This work shall include all necessary provisions and incidental tasks and materials to complete the Work Items, including but not limited to:

1. Preparing areas to receive Penetrating Concrete Sealer with Migrating Corrosion Inhibitor according to manufacturer's recommendations, which will include shot blasting. Concrete dust removed traffic marking paint laitance, and debris from shot blasting operations shall be cleaned up immediately following completion of the shot blasting each day. Floor drains shall be protected from infiltration of dust, debris, and shot, resulting from shot blasting operations. Dust on the concrete deck resulting from shot blasting shall be swept and removed upon completion of the blasting operations before any rain events and prevented from accumulation on the floor or on the floor drain inlets. Air blast to disperse concrete dust off of the garage is not allowed.
2. Concrete repairs, removal and replacement of joint sealants, and any other work to the concrete surface within the areas to receive Penetrating Concrete

Sealer with Migrating Corrosion Inhibitor shall be performed prior to surface preparation and application as directed and will be paid under the appropriate related Work Items.

3. Measuring and/or calculation of prepared areas with Engineer for Payment Application. Payment will be made on a Square Foot basis.
4. Applying Penetrating Concrete Sealer with Migrating Corrosion Inhibitor to floor slab areas.
5. Restoring the work areas for use by Owner.

B. Products

1. Materials to be utilized shall conform to Specification Sections 07190.

C. Procedures

1. Application of Penetrating Concrete Sealer with Migrating Corrosion Inhibitor shall be as specified in Specification Section 07190.
2. Submit product data as required by Specification Section 07190.
3. Contractor to submit As-Built plans of areas that have received Penetrating Concrete Sealer with Migrating Corrosion Inhibitor which shall indicate SF quantities of Penetrating Concrete Sealer with Migrating Corrosion Inhibitor applied.

2.9 Floor Repair – Pavement Markings (Not In Contract / Furnished By Owner)

A. Scope of Work

Pavement Marking will be installed by the Owner at the completion of each Phase of the project. The Contractor shall coordinate the contract work with the Owner related to the pavement marking work including cleanliness of the substrate and movement of materials and equipment to facilitate the work without delay to the pavement marking work or in opening the completed phase area to parking.

3. CEILING REPAIRS

3.1 Ceiling Repairs – Not Used

3.2 Ceiling repairs – Not Used

3.3 Ceiling Repair – Epoxy Crack Injection

A. Scope of Work

This work consists of all necessary provisions and incidental tasks and materials to complete crack repair work in elevated concrete elements including precast concrete double-tee floor elements, stair tower cross-over slabs, and other areas. The cracks may be in the top, bottom, sides, or ends of the concrete elements. This work applies for cracks in the horizontal, vertical, overhead, or sidewall orientation, including but not limited to:

1. Reviewing all areas to be repaired with the Engineer prior to commencement of work. Repair areas will be located and marked by the Engineer and/or as marked by the Contractor as directed and approved by the Engineer prior to commencement of work.
2. Measuring the prepared repair areas with the Engineer and recording the pay quantity of each repair area on the As-Built Plans. Payment shall be made on a Liner Foot (LF) basis.
3. Preparing areas to receive epoxy crack injection including grinding and air blast cleaning, drilling and installation of injection port fittings, sealing of cracks (front and back where applicable) with the epoxy manufacturer's recommended epoxy resin paste/mortar.
4. Injection of epoxy resin adhesive using high pressure injection equipment in accordance with the product manufacturer's instructions.
5. Removal of all injection ports and grinding/cleaning of the surface, after the curing period, to produce a finish appearance that is acceptable to the Owner's Representative.
6. Restoring the work areas for use by Owner.

B. Products

1. Materials to be utilized shall conform to Specification Sections 03930.

C. Procedures

1. Application of epoxy-injected crack repairs shall be as specified in Specification Section 03930.
2. Submit product data as required by Specification Section 03930.
3. Contractor to submit As-Built plans of areas that have received epoxy-injected crack repairs which shall indicate LF quantities of cracks repaired.

3.4 Ceiling Repair – Overhead Concrete Mortar Repair

A. Scope of Work

This work consists of all necessary provisions and incidental tasks and materials to complete concrete repair patch work which will vary in size shape and thickness in elevated concrete elements including precast concrete double-tee floor elements, stair tower cross-over slabs, or other areas. The repair areas may be in the top, bottom, sides, or ends of the concrete elements as directed. The thickness of the patch material is anticipated to be irregular and tapering, ranging from approximately ¼” at the cut-in edges up to approximately 2” thickness in some areas, with an overall average depth of approximately 1” to 1½”. Patch areas must be adjusted to fully embed the cathodic protection anodes provided in Work Item 3.8 as recommended by the manufacturer. This work applies for concrete repair patching in the horizontal, vertical, overhead, or sidewall orientation, as directed by the Engineer, including but not limited to:

1. Reviewing all areas to be repaired with the Engineer prior to commencement of work. Repair areas will be located and marked by the Engineer and/or as marked by the Contractor as directed and approved by the Engineer prior to commencement of work. Contractor shall provide means of access to the repair areas if necessary, for the Engineer to mark the repair areas.
2. Preparing areas to receive Overhead Concrete Mortar Repair including removing loose and/or deteriorated concrete to sound concrete surface and preparing the surface in accordance with the repair mortar manufacturer’s recommendations. Sandblasting of the prepared patch areas and exposed reinforcing steel shall be performed under Work Item 3.9. Incidental localized sandblasting as directed by the Engineer shall be subsidiary to the ceiling Repair Items and/or Work Item 3.9.
3. Coating exposed steel reinforcing bars with epoxy coating for reinforcement protection shall be subsidiary to the work.

4. Measuring the prepared repair areas with the Engineer and recording the pay quantity of each repair area on the As-Built Plans. Payment shall be made on a Square Foot (SF) basis.
5. Mixing and application of the repair Mortar in accordance with the product manufacturer's instructions.
6. Grinding and cleaning of the surface, after the curing period, to produce a finish appearance that is acceptable to the Owner's Representative.
7. Restoring the work areas for use by Owner.

B. Products

1. Materials to be utilized shall conform to Specification Sections 03732.
2. Repair mortar shall be compatible with galvanic corrosion protection anodes installed under Work Item 3.8.

C. Procedures

1. Application of repair mortar shall be as specified in Specification Section 03732.
2. Submit product data as required by Specification Section 03732.
3. Contractor to submit As-Built plans of areas that have received Overhead Concrete Mortar Repair which shall indicate SF quantities of areas repaired.

3.5 Ceiling Repair – GFRP Fabric Wrap

A. Scope of Work

This work consists of all necessary provisions and incidental tasks and materials to furnish and install pre-saturated glass fiber reinforced polymer wrap system specifically manufactured for the purpose of application to concrete surfaces for strengthening and repair. The GFRP Fabric Wrap shall be applied to selected (not all) ends of the stems of the precast concrete double tee floor elements (and any other designated areas) as directed by the Engineer.

Surface primers, resin, and seal coat materials as recommended by the GFRP Fabric Wrap manufacturer shall be subsidiary. Incidental materials or expendables, such as applicators, cleaning agents or other disposable items, as required for this work and shall be considered as subsidiary. This work includes but not limited to:

1. Reviewing all areas to receive Work Item 3.5 with the Engineer prior to commencement of work. Areas will be located and marked or designated on a Plan worksheet by the Engineer and/or as marked by the Contractor as directed and approved by the Engineer prior to commencement of work. Contractor shall provide means of access to the repair areas if necessary, for the Engineer to mark the repair areas.
2. Perform all concrete patching work, concrete crack injection work, and application of penetrating corrosion inhibitor under the related Work Items prior to surface preparation for Work Item 3.5 - GFRP Fabric Wrap.
3. Preparing areas to receive GFRP Fabric Wrap as recommended by the manufacturer and as directed by the Engineer including subsidiary water blasting (pressure washing) of surfactant residue off of surfaces that have had Work Item 3.6 Penetrating Corrosion Inhibitor applied. Surface preparation shall include subsidiary grinding of surfaces and/or sharp edges as directed by the Engineer and shall be in accordance with the manufacturer's recommendations.
4. Cutting the GFRP Fabric Wrap into sizes and shapes as necessary to cover the areas indicated on the plans and as directed by the Engineer. Mixing and application of primer coatings, GFRP Fabric Wrap materials, and sealcoat coatings in accordance with the product manufacturer's instructions.
5. The GFRP Fabric Wrap shall be completely inspected by the contractor during and immediately following application of the composite materials. Conformance with the design drawings, proper alignment of fibers and quality workmanship shall be assured. Entrapped air shall be released or rolled out before the epoxy sets. After the GFRP Fabric Wrap has cured, the Contractor shall re-inspect all work to check for areas of voids or disbonding.
6. Measuring the installed GRFP Fabric Wrap repair areas with the Engineer and recording the pay quantity of each repair area on the As-Built Plans. Payment shall be made on a Square Foot (SF) basis.
7. Installed GFRP Wrap that has protruding / rough edges or has not been applied in a neat, tightly wrapped, and smooth-finished appearance will not be accepted and shall be removed and reinstalled by the Contractor as directed by the Engineer/Owner Representative at no additional cost to the Owner. GFRP Wrap removal and surface re-preparation shall be by grinding or other pre-approved means.
8. Restoring the work areas for use by Owner.

B. Products

1. Unidirectional glass fiber fabric pre-saturated to form a glass fiber reinforced polymer (GFRP) manufactured to be used to strengthen structural concrete elements.
2. High-modulus, high-strength, two-part, 100% solids, epoxy primer for application of GFRP wrap, as recommended and supplied by the GFRP wrap manufacturer.
3. Pre-accepted products to be incorporated into the work include:
 - a. SikaWrap Pre-saturated 430G & Sikadur 340 primer, as manufactured by Sika Corp.
 - b. Or approved equal.

C. Procedures

1. Application of GFRP Fabric Wrap, including surface preparation and priming, shall be in accordance with the manufacturer's written instructions and site-specific recommendations.
2. Submit product data, Material Safety Data Sheets (MSDS / SDS), and installation instructions.
3. Contractor to submit As-Built plans to be submitted as backup with periodic pay application(s) that indicate areas that have received GFRP Fabric Wrap including locations and SF quantities of areas repaired.

3.6 Ceiling Repair – Penetrating Corrosion Inhibitor

A. Scope of Work

This work consists of all necessary provisions and incidental tasks and materials to furnish and install Item 3.6 Ceiling Repair – Penetrating Corrosion Inhibitor consists of all work and incidentals for the application of spray-applied penetrating corrosion inhibiting impregnation coating (migratory corrosion inhibitor) specifically manufactured for the purpose of application to prepared hardened concrete surfaces and appropriate for overhead application. The penetrating corrosion inhibitor shall be applied to the underside (overhead) and vertical surfaces of the ends of precast concrete double-tee floor elements as indicated on the Plans and as directed by the Engineer.

Incidental materials or expendables, such as applicators, cleaning agents or other disposable items, as required for this work and shall be considered as subsidiary. This work includes but is not limited to:

1. Reviewing all areas to receive Work Item 3.6 as indicated on the plans with the Engineer prior to commencement of work.
2. Preparing areas to receive penetrating corrosion inhibitor as recommended by the manufacturer and as directed by the Engineer. Abrasive media blast cleaning (sandblasting) surface preparation for the penetrating corrosion inhibitor shall be performed under Work Item 3.9 Ceiling Repair – Blast Cleaning w/ Abrasive Media. The abrasive media blast cleaning surface preparation shall be performed after demolition of ceiling concrete repair patch areas for Work Item 3.4 and shall include subsidiary localized supplementary blast cleaning as directed by the Engineer.
3. Performing all concrete patching work and concrete crack injection work, under the related Work Items prior to the pre-inspection and final surface preparations which may include localized grinding or other surface treatments/cleaning for the application of penetrating corrosion inhibitor.
4. Application of at least two (2) coats of penetrating corrosion inhibitor in accordance with the product manufacturer's instructions including surface moisture content, ambient and surface temperatures, ambient humidity, application equipment, coverage rates, and penetration cure/dry time between coats. Concrete patch materials and concrete crack injection material shall be adequately cured in accordance with manufacturers recommendations prior to application of penetrating corrosion inhibitor.
5. Verifying that the minimum full application areas are in conformance with the plans with the Engineer and recording the pay quantity of application area on the As-Built Plans. Measurement and payment of overspray areas or application to areas not as directed by the Engineer will not be made. Payment shall be made on a Square Foot (SF) basis.
6. Restoring the work areas for use by Owner, including power washing of the structural steel beams, columns and floor to remove overspray residue.

B. Products

1. Penetrating, corrosion inhibiting, impregnation coating for hardened concrete manufactured to penetrate the surface of the concrete and diffuse in vapor or liquid form to reach and form a protective layer on the surface of the steel reinforcing bars embedded in the concrete. The product must be tested and proven to penetrate in overhead applications.

2. Pre-accepted products to be incorporated into the work include:
 - a. Sika FerroGard 903, as manufactured by Sika Corp.
 - b. MasterProtect 8000CI, as manufactured by Master Builders Solutions/BASF
 - c. Or approved equal

C. Procedures

1. Application of Penetrating Corrosion Inhibitor shall be in accordance with the manufacturers written instructions and site-specific recommendations.
2. Submit product data, Material Safety Data Sheets (MSDS / SDS), and installation instructions.
3. Contractor to submit As-Built plans of areas that have received Penetrating Corrosion Inhibitor which shall indicate SF quantities of Penetrating Concrete Sealer with Migrating Corrosion Inhibitor applied.

3.7 Ceiling Repair – Not Used

3.8 Ceiling Repair – Galvanic Corrosion Protection

A. Scope of Work

This work consists of all necessary provisions and incidental tasks and materials to furnish and install Item 3.8 Ceiling Repair – Galvanic Corrosion Protection consisting of embedded galvanic anode materials specifically manufactured for the purpose of protection of concrete reinforcing steel in repaired concrete surfaces. The embedded galvanic anodes shall be installed in the prepared cavities to receive concrete patch materials under Work Item 2.1 and Work Item 3.4.

Incidental materials, expendables, or disposable items, as required for this work shall be considered as subsidiary. This work includes but not limited to:

1. Reviewing all areas to be repaired under Work Item 2.1 and Work Item 3.4 with the Engineer after initial concrete removal. Locations for installation of galvanic corrosion protection anodes will be identified and marked by the Engineer and/or marked by the Contractor as directed and approved by the Engineer prior to commencement of the work. Contractor shall provide means of access to the repair areas if necessary, for the Engineer to mark the installation locations.

2. Preparing areas to receive galvanic corrosion protection anodes including removing (chipping) subsidiary additional concrete around the reinforcing steel to allow adequate installation space and patch mortar cover and preparing the steel and concrete surfaces in accordance with the galvanic corrosion protection manufacturer's recommendations. Sandblasting of the prepared patch areas and exposed reinforcing steel shall be performed under Work Item 3.9 prior to installation of galvanic corrosion protection anodes. Incidental localized sandblasting as directed by the Engineer shall be subsidiary to the ceiling Repair Items and/or Work Item 3.9 Blast Cleaning w/ Abrasive Media.
3. Installation and conductivity testing of galvanic corrosion protection anodes in accordance with the product manufacturer's instructions.
4. Measuring the quantity of galvanic corrosion protection anodes with the Engineer prior to the application of concrete patch materials and recording the locations and pay quantity on the As-Built Plans to be submitted as backup with periodic pay application(s). Payment shall be made on a per Each (EA) basis.
5. Restoring the work areas for use by Owner.

B. Products

1. Materials to be utilized shall conform to Specification Section 03700.

C. Procedures

1. Installation of galvanic protection materials be as specified in Specification Section 03700, in accordance with the manufacturer's instructions and/or recommendations.
2. Submit product data, Material Safety Data Sheets (MSDS / SDS), and manufacturers installation instructions and requirements of Specification Section 03700.
3. Contractor to submit As-Built plans indicating locations and quantity of installed galvanic protection anodes.

3.9 Ceiling Repair – Blast Cleaning w/ Abrasive Media

A. Scope of Work

This work consists of all necessary provisions and incidental tasks and materials for Item 3.9 Ceiling Repair – Blast Cleaning w/ Abrasive Media to provide surface

preparations for ceiling repairs under Work Items 3.4, 3.5, 3.6, and 3.8.

Localized blast cleaning w/ abrasive media for surface preparations for floor repairs, including exposed rebar cleaning and patching cavity surfaces under Work Items 2.1, 2.2, and 2.3, and for brush blast coating surface preparation for Work Item 2.7B Wearcoat, and any other incidental areas as directed by the Engineer, shall be subsidiary to the respective Work Items and/or the overall project under Work Item 1.1.

Incidental materials or expendables, dust shielding, and other disposable items, as required for this work and shall be considered as subsidiary. This work shall include but is not limited to:

1. The Contractor shall design, provide, and install protective shielding as necessary to prevent surface abrasion or other damage to existing items within and adjacent to the areas to receive blast cleaning with abrasive media. The existing items which shall be protected from blast cleaning abrasion include but are not limited to items such as localized areas of structural steel columns and beams, metal & pvc electrical conduits & boxes, fire alarm devices, drain piping, etc.
2. The Contractor shall design, provide, and install sufficient quantities of materials to construct temporary dust/debris containment for the work area as generally indicated on the Plans in order to locally contain the abrasive media and the dust created by the blast cleaning operations to be restrained within the areas along the column rows where the blast cleaning operations are being performed. Dust and debris shielding must prevent dust from being wind-blown across the garage floor and out of the garage wall screening.
3. Blast Cleaning w/ Abrasive Media shall be performed to an extent and profile consistent with the manufacturer's recommendations for the products to be applied to the particular surface areas and as directed by the Engineer. Areas to receive Work Item 3.6 Penetrating Corrosion Inhibitor shall receive a brush blast to clean and open the concrete surface to the coating absorption/penetration. Ceiling (and subsidiary floor) areas to receive concrete patch materials and/or bonding agents shall receive a full heavy blast cleaning to remove all laitance and prepare the cavity for material application. Exposed reinforcing steel shall be blast cleaned to a near-white metal surface in accordance with SSPC-SP10 to be free of all visible oil, grease, dust, dirt, mill scale, rust, coating, oxides, corrosion products, and other foreign matter when viewed without magnification.
4. Clean-up of all abrasive media and significant dust created by the blast cleaning operations within the work areas, or any areas of the garage or Airport where errant media or dust has migrated to (including any affected parked vehicles, beams/columns, signage, floor drains & piping, windows, fire detection/strobes,

garage solar power electrical equipment, or other appurtenances) as observed by the Owner shall be subsidiary to this Work Item and/or Work item 1.1.

B. Products

1. The Contractor shall select the appropriate sand blasting abrasive media for the ceiling repairs work based on the field conditions observed, the sandblasting equipment that will be mobilized, sound industry practices, and the surface preparation that is required for the application of the various repair materials based on the repair materials manufacturers' recommendations.
2. Sandblasting media shall be a product specifically recommended by the manufacturer for use to sandblast concrete surfaces.
3. The Contractor shall select the appropriate materials for the construction of the dust/debris containment and shielding for abrasive blast cleaning work based on the field conditions observed, the equipment that will be mobilized, safety and environmental considerations, and sound industry practices.

C. Procedures

1. Submit product data and Material Safety Data Sheets (MSDS / SDS) for the abrasive media to be utilized on this site.
2. The Contractor shall submit an installation sketch of the dust/debris containment for the Owner's review at least two weeks prior to commencement of abrasive blast cleaning work. The submittal shall indicate how the materials will be temporarily secured to the garage structure. The Contractor's dust/debris containment final design shall not impart significant loadings by weight or excessive wind force transfer onto the garage structure nor leave permanent markings or damage to existing structural elements, conduits, piping, or other appurtenances.
3. Measuring the quantity of Item 3.9 Ceiling Repair – Blast Cleaning w/ Abrasive Media with the Engineer prior to the application of Item 3.6 Penetrating Corrosion Inhibitor and recording the locations and pay quantity on the As-Built Plans to be submitted as backup with periodic pay application(s). Payment shall be made on a Square Foot (SF) basis. Payment area shall be taken as indicated on the Plans with no allowance for incidental / subsidiary or inadvertent blast cleaning outside the limits established for the application of the ceiling repair materials. Deductions to the pay quantity area shall be made for areas that do not receive blast cleaning w/ abrasive media.
4. Restoring the work areas for use by Owner.

4 WALL REPAIR - NOT USED

5 FLOOR SLAB JOINT REPAIRS

5.1 Floor Slab Joint Repair – Not Used

5.2A Floor Slab Joint Repair - Expansion Joint Nosing - Surface Repair

A. Scope of Work

This work consists of partial depth removal of deteriorated, cracked, chipped, and/or spalled, expansion joint nosing material and installation of replacement expansion joint nosing material to match the existing. This Work Item is represented by detail 5.2A on the repair details drawings, and shall be installed in accordance with provisions of the nosing material manufacturer's product specifications, installation procedures, and recommendations.

This work shall include all necessary provisions and incidental tasks and materials to complete the Work Items, including but not limited to:

1. Inspect and identify areas to be repaired with the Engineer. The limits of areas to be receive repairs under Item 5.2A will be marked by the Engineer.
2. Removal of existing expansion joint nosing material as indicated on the plans and as directed by the Engineer. Preparation of areas to receive expansion joint nosing material as recommended by the manufacturer.
3. Installing elastomeric concrete expansion joint nosing material matching the existing expansion joint nosing material and existing expansion joint system.
4. Measuring and/or calculation of prepared areas with Engineer for Payment Application. Payment will be made on a Linear Foot (LF) basis.
5. Restoring the work areas for use by Owner.

B. Products

1. The existing expansion joint nosing material is Wabo®Crete II as Manufactured by Watson Bowman ACME Corporation / BASF. The surface repair expansion joint nosing material for this work shall be the same product as the existing expansion joint nosing material.

C. Procedures

1. Installation of nosing material shall be in accordance with provisions of the nosing material manufacturer's product specifications, installation procedures, and recommendations.
2. Submit manufacturer's product data.
3. Contractor to submit As-Built plans of areas that have received expansion joint nosing repairs which shall indicate location and LF quantities installed.

5.3 Floor Slab Joint Repair – Remove and Replace Failed T/T Flange Joint Sealants

A. Scope of Work

This work consists of replacing all failed (dis-bonded or deteriorated) elastomeric joint sealants between the precast concrete Double-Tee floor elements and other components of the parking garage and includes the work shown in Drawing Detail 5.3 and all necessary provisions to complete the work associated with Work Item 5.3 including:

1. Initial pressure washing and exploratory water testing: (NOT REQUIRED)
2. Locating, marking, and reviewing with the Engineer all failed (dis-bonded or deteriorated) Precast Concrete Double-Tee joint sealants or other areas for sealant replacement as found to be necessary and as directed by the Engineer.
3. Remove failed joint sealant and remove existing backer rod.
4. Thoroughly clean and prepare exposed areas, including grinding, vacuuming, and solvent wipe of existing sealant to new sealant transitions (where applicable) with solvent (xylene) or approved equal.
5. Preparation grinding of the joint cavities. Re-shaping of the precast tee-to-tee connection pocket cavity corners is not anticipated to be necessary. All grinding work shall be subsidiary to the joint sealant replacement item.
6. Install bond breaker at appropriate locations subsidiary to the sealant work as directed by the Engineer.
7. Install new closed cell backer rod as required, and localized areas of non-sag elastomeric sealant application (joint buttering) as required to provide a leak-proof joint cavity to prevent drips onto the areas below the work. The Contractor shall clean and correct any conditions created on parking level below by inadequate sealant cavity preparations. The Contractor shall place

an observer on the level below the jointlines during sealant installation to verify compliance and provide immediate corrective action.

8. Prime sealant bonding surface along sides of joint to receive new sealant with the sealant manufacturers recommended primer.
9. Protect sealant from traffic and dirt until fully cured.
10. Verification water testing (NOT REQUIRED)
11. Measuring prepared joint length with the Engineer for Payment Application. Payment shall be made on Linear Foot (LF) basis.
12. Restoring the repaired areas for use by Owner.

A. Products

1. Materials to be utilized shall conform to Specification Section 07920.

B. Procedures

1. Application of joint sealants shall be as specified in Specification Section 07920.
2. Submit product data as required by Specification Section 07920.
3. Traffic toppings shall be installed after elastomeric sealant materials have cured in accordance with the manufacturer's recommendations

5.4 Floor Slab Joint Repair – Not Used

5.5 Floor Slab Joint Repair - Precast Tee Endjoint Replacement - CIP Wash

A. Scope of Work

Work Item 5.5 Floor Slab Joint Repair - Precast Tee Endjoint Replacement - CIP Wash consists of removal and replacement of the precast tee-to-tee endjoints at locations designated on the Plans or as indicated in the field by the engineer. The proposed joint replacement will be installed as shown on the Plans and will include all necessary provisions to complete the work associated with Work Item 5.5 including but not limited to:

1. Locating, marking, and reviewing with Engineer areas to receive joint replacement.

2. The endjoint replacement locations at the Drive Bays will be adjacent to areas of CIP Concrete Wash Repairs as detailed on the Plans and performed under Work Item 2.1. Coordination with the installation of the proposed joint replacement must be considered and appropriate measures and formwork provided accordingly.
3. Preparation of exposed areas and installation of: Expanding Foam Sealant according to all manufacturer's instructions, specifications, and the manufacturer's representative site-specific recommendations.
4. Measuring prepared joint length with Engineer for Payment Application. Payment shall be made on LINEAR FOOT basis.
5. Restoring the repaired areas for use by owner.

B. Products

1. Expanding Foam Sealant shall be traffic-bearing grade, high-density, UV-stable acrylic polymer-impregnated micro-cell polyurethane pre-compressed expanding foam strip sealant. Impregnation agent to have non-migratory characteristics. Compression when expanded in the joint shall be approximately 20% of its uncompressed dimension, depth of seal as recommended by manufacturer. Foam seal to be installed into manufacturer's standard epoxy adhesive on both sides of joint cavity. Joint shall not have silicone surface coating or other adhesion barrier to traffic coatings. Exposed surface to be sealed with foam sealant manufacturer's standard topcoat or other treatment for bonding of traffic coatings to be applied above.
2. Subject to compliance with requirements and project-specific product data submittal, pre-accepted products that may be incorporated into the work include the following:
 - a. Wabo HSeal as manufactured by Watson Bowman Acme Corp. / BASF Construction NA
 - b. "EMSEAL – DSM System" as manufactured by EMSEAL Joint Systems LTD.
 - c. Or equal as approved by engineer.

C. Procedures

1. Contractor shall arrange for a pre-construction site meeting with manufacturer's representative, Owner's Representative, and Engineer, to review the existing site conditions and the proposed installation

procedures.

2. Install joint sealant according to manufacturer's recommendations and coordinate with installation of Traffic Topping membrane application to be performed under Work Item 2.7.
3. Submit product data in the form of manufacturer's product specifications, installation instructions, and documented manufacturer representative's site-specific recommendations, prior to commencement of any work under this item.
4. Submit written correspondence (letter) from the joint manufacturer and the traffic topping manufacturer indicating that the exposed surface of the expanding foam sealant joint material is suitable for adhesion of the traffic topping coating, with recommendations for application of a primer to the joint material surface before traffic topping coating application if necessary.

5.6 Floor Slab Joint Repair – Remove and Replace Cove Sealant – Precast or C.I.P. Slab

A. Scope of Work

This work consists of the removal and replacement of cove sealants at intersections of precast and CIP slabs with adjacent vertical surfaces, and all necessary provisions to complete the work associated with Work Item 5.6 as shown in Detail 5.6 on the Plans including but not limited to:

1. Locating, marking, and reviewing with Engineer joints to be sealed or resealed.
2. Removal of existing failed joint sealants as applicable.
3. Thoroughly clean and prepare exposed areas, including grinding, air blast, and wipe clean with xylene.
4. Measuring prepared joint/crack length with Engineer for Payment Application.
5. Payment shall be made on LINEAR FOOT basis.
6. Install backer rod for any locations to receive cove sealants that do not have existing direct back-up material.
7. Prime edges of joint/crack to receive new sealant according to manufacturer recommendations.
8. Reseal joint/crack with joint sealant.

9. Protect sealant from traffic and dirt until fully cured.

10. Restoring the repaired areas for use by owner.

B. Products

1. Materials to be utilized for non-sag elastomeric sealant shall conform to Specification Section 07920.

C. Procedures

1. Application of joint sealants shall be as specified in Specification Section 07920 and in accordance with the manufacturer's instructions.

2. Submit product data as required by Specification Section 07920.

6 STRUCTURAL STEEL REPAIR – NOT USED

7 FLOOR DRAIN REPAIR - NOT USED

8 BOLLARDS & TRAFFIC CONTROL

8.1 Bollards & Traffic Control – Concrete Bollard Removal

A. Scope of Work

This work consists of removal of the existing precast concrete traffic bollards on Level-3 as indicated on the plans and as directed by the engineer, Typical As Required throughout the work zone and/or other areas as directed by the Owner or Engineer, and the flush-cutting of the bollard anchor bolts as shown on the plans in Drawing Detail 8.1 and specifications, and all necessary provisions to complete the work associated with Work Item 8.1 including:

1. Reviewing all bollards to be removed with the Engineer prior to commencement of work. Bollard removal and floor patching as directed by the Engineer shall be completed prior to commencement of surface preparations (shot-blasting) for traffic coatings or concrete floor sealer work.
2. All bollards shall be lifted and removed from their steel bases and placed outside the garage at the maintenance driveway area located adjacent the north end of the garage. Bollards shall be neatly placed in a compact group manner as directed by the Owner for easy future handling access and to avoid traffic impedance.
3. All bollard mounting steel bases shall be removed and disposed of by the Contractor. Removal of steel base anchor bolt nuts and steel base removal shall be performed with care to avoid damage the concrete floor. Floor areas damaged by the bollard removal operations shall be repaired by the Contractor as directed by the Engineer at no additional cost to the Owner.
4. Anchor bolts shall be cut-off and ground flush to the floor as shown in Detail 8.1. Some bollard anchor bolts in other areas of the parking garage have been previously observed to have an epoxy adhesive bonding failure and pull out of the deck. Anchor bolts that are not securely adhered to the concrete floor shall be removed and the holes filled with non-shrink grout. It is expected that the majority of the anchor bolts in the work area will be securely fastened to the deck and will require cutting. The grouting of holes from dislodged anchor bolts

in place of cutting off the bolts shall be subsidiary to the work.

5. Areas below the bollards where the concrete floor is damaged shall be repaired as directed by the Engineer under work Item 2.3.
6. Counting the bollards that have been removed with the Engineer for payment Application. Payment shall be made on a per Each (EA) basis.

A. Products

1. Non-shrink grout materials to be utilized for the filling of anchor bolt holes, where applicable, shall conform to Specification Section 03732.

B. Procedures

1. Removal shall be as shown and described on Detail 8.1 and as specified in Specification Section 03732.
2. Submit product data as required by Specification Section 03732.

8.2 Bollards & Traffic Control – Concrete Bollard Disposal

A. Scope of Work

This work consists of loading, hauling, and offsite disposal of the existing precast concrete traffic bollards that are removed from Level-3 under Work Item 8.1 as indicated on the plans and as directed by the Engineer. The Lump Sum amount for this Work Item shall include the offsite disposal of up to 65 precast concrete bollards. The scope of work includes all incidental work and materials, and all necessary provisions to complete the work including:

1. Areas where bollards are temporarily placed prior to loading for disposal shall be cleaned and swept of all dust and debris immediately following the completion of loading operations.
2. Advance scheduling and coordination with Airport Operations Communication Center for truck access around the parking garage and airport terminal roadway.
3. Traffic must be maintained in the airport access roadway at all times. Provide traffic warning signs and/or flagmen as directed by the Engineer if truck loading operations affect traffic in the access roadway.
4. Verifying that all the bollards have been disposed of offsite with the Engineer for Payment Application. Payment shall be made on a Lump Sum (LS) basis.

B. Products

1. All materials and products provided for the Work included herein shall be of commercial and/or industrial grade and in conformance with sound construction industry standards.

C. Procedures

1. Transport and offsite disposal of concrete bollards shall be in accordance with all applicable laws and regulations.

8.3 Bollards & Traffic Control – Provide Traffic Delineator Devices (Material)

A. Scope of Work

This work consists of furnishing (purchasing), delivering, and offloading the specified traffic delineator devices including the epoxy adhesive materials, to the site. The material shall be neatly staged, in its original packaging, on Level-3 in a designated area as directed by the Owner. Installation of the Traffic Delineator Devices is not included in this Work Item.

1. The work shall include counting the traffic delineator devices that have been delivered to the site with the Engineer for Payment Application. Payment shall be made on a per Each (EA) basis.

B. Products

1. Traffic Delineator Devices shall match the configuration and appearance of existing traffic control delineators on Level-4 of the parking garage:
 - a. Pre-accepted products for this work include:
 - i. Flexstake 750 Series Tubular marker Delineator as manufactured by ROADTECH Manufacturing Inc.
 - ii. BOOMERANG Surface Mount Reboundable Delineator TD5200 Series as manufactured by Three D TrafficWorks, a division of ThreeD Plastics, Inc.
 - b. Refer to Specification Section 02840 for specific product (size, height, color, retroreflective tapes, caps, base, etc.) and installation details (epoxy adhesive) and information.
2. If the matching product to the existing traffic delineator devices cannot be

procured in a timely manner to be installed on this project or cost considerations preclude its use, then, at the option of the Owner, an approved equal of the Traffic Delineator Devices shall conform to Specification Section 02840.

C. Procedures

1. Submit product data as required by Specification Section 02840.
2. Handle, store, and protect delivered material in accordance with the manufacture's recommendations. If directed by the Owner, the Contractor shall provide pallets, plastic tarp covering, and strapping as required to protect materials and packaging.

8.4 Bollards & Traffic Control – Install Traffic Delineator Devices

A. Scope of Work

This work consists of unpacking and installing the Traffic Delineator Devices that are furnished and delivered to the site under Work Item 8.3 including:

1. Contractor shall layout, mark, and review locations for Traffic Delineator Devices installation with the Engineer prior to commencement of work. Traffic Delineator Devices are to be installed on center-points of the former locations of the original concrete bollard locations, including some locations where the existing bollards were previously removed, in the same configuration as the existing delineators on Level-4 of the parking garage unless directed otherwise by the Engineer. Traffic Delineator Device installation shall be completed after all other repairs, coatings, and pavement marking work is completed at or in the adjacent localized area of the proposed installation locations.
2. Surface preparations, as recommended by the adhesive manufacturer, for the mounting of the Traffic Delineator Devices.
3. Anchoring the Traffic Delineator Devices with epoxy adhesive.
4. Pull-test each Traffic Delineator installation with the Engineer, after the adhesive curing period, to ensure adequate anchorage/bonding has been achieved. Pull-testing shall consist of two-handed upward and lateral lifting/pulling/twisting with approximately 50 pounds of lifting force.
5. Proper offsite disposal of all packaging materials.
6. Counting the traffic delineator devices that have been installed and tested with the Engineer for Payment Application. Payment shall be made on a per Each (EA) basis.

B. Products

1. Epoxy adhesive materials to be utilized for the anchoring of Traffic Delineator Devices shall conform to Specification Section 02840.

C. Procedures

1. Assembly and installation of Traffic Delineator Devices shall be as specified in Specification Section 02840.
2. Submit product data as required by Specification Section 02840.

9 FIELD ITEMS & ALLOWANCES

9.1 Field Item – Pedestrian Bridge Pier-B - Grade Stairs & Ramp Repairs

A. Scope of Work

1. General:

The purpose and intent of the Grade Stairs & Ramp Repairs is to perform concrete repairs, install sealants and protective coatings, and generally rehabilitate the existing conditions including limited aesthetic improvements at and around the existing pedestrian stairway and handicap access ramp underneath Pier-B of the elevated (Level-2) Pedestrian Bridge that connects the Parking Garage to the Airport Terminal.

Work Item 9.1 consists of any and all additional Work for the Grade Stairs & Ramp Repairs as required or may be necessary to suit the Contractor's means and methods that is not called for to be provided under the other Contract Work Items, or that is not noted (herein or in other sections of the Contract Documents) as subsidiary to any of the other Work Items in the Contract.

The unit price Work Item locations indicated on the Plans for this area are approximate and are intended to convey the character of the work in order for the Contractor to include all related General Conditions, and other ancillary work, coordination, and considerations, that may be required in the Bid Price for Item 9.1. The Engineer or Owner shall mark and/or direct the Contractor on the exact locations and limits of areas to receive the unit price Contract Work Items that are to be utilized in the Grade Stairs & Ramp Repairs which will be paid for separately under those Work Items.

2. Work Item 9.1 shall include and incorporate all necessary provisions to complete the associated work including, but not limited to, the following:
- a. Supplementary general conditions related to this work including night shift differential for work designated (or elected by the Contractor) to be performed at night, debris shielding/capture barricades, and temporary or permanent ancillary work or materials for the repairs to the concrete walls, slabs, and other designated areas as noted on the Plans or called for in this Specification.
 - b. Locating, marking, and reviewing with Engineer all areas to receive work.
 - c. Removal of the existing troweled-on protective coating on the surfaces of the concrete walls in areas designated on the Plans.
 - d. Abrasive blasting of all concrete surfaces on the walls and sidewalk slabs area that have had the existing troweled-on coating removed and all areas to receive traffic topping coatings under Work Item 2.6. The resulting concrete surface shall be clean and uniform with a surface profile roughness of approximately $\leq 1/16"$. All Abrasive blasting, in this area shall be performed at night during hours of no airline flight activity when the stairway area can be closed. The closure hours are approximately 12:30 am to 4:30 am, to be confirmed and approved by the Owner based on the flight schedules for the days that the Contractor proposes to perform the work.
 - e. Concrete demolition for the repairs to the top of the retaining walls. Demolition for areas to be repaired with Work Item 3.4 is subsidiary to that item.
 - f. Abrasive blasting of all exposed reinforcing steel and all steel embedment's exhibiting surface corrosion. All exposed steel to be encapsulated in new concrete repair shall receive 1 coat of epoxy protective coating, as specified for other Work Items, and subsidiary to this work.
 - g. Temporary bracing of existing handrails during concrete repairs demolition/placement as may be required to ensure stability or as directed by the Engineer.
 - h. The handrail post bases below the lower horizontal rail, and any other surfaces of the existing galvanized handrails at that are abraded by the work, shall receive one coat of approved industrial duty cold-galv coating or one coat of epoxy protective coating for steel as directed by the Engineer and subsidiary to the work.

- i. Forming, supplementary reinforcing steel, placement and finishing of concrete repair mortar.
- j. Furnish and install all labor and materials as required to perform the work.
- k. Restoring the affected areas for use by Owner between work stages and when complete. Final cleanup shall include power washing of the work areas to remove dust and laitance which shall be performed during night closure hours.
- l. Payment for the proposed overall work which would not be applicable to the other Bid Work Items, shall be performed under Item 9.1 - Field Item Allowance - Pedestrian Bridge Pier-B Grade Stairs & Ramp Repairs. Payment for such work shall be made for the LUMP SUM COST basis for the work if selected for installation by the Owner.
- m. The Owner may at its sole discretion, based on field conditions or other considerations, redistribute (reduce) all or part of this work scope to provide additional funding for Contract Item quantities.

3. Access & Work Areas Capture:

This stairway and ramp location serves as part of the primary public grade-level (Level-1) exterior pedestrian connection from the Terminal Main Entrance to the Taxi-Lane, the Hotel-Shuttle/Limo-Lane waiting & pickup area, Parking Lot-A, the Rental Car Customer Service Facility (RCCSF), and the Parking Garage. This stairway and ramp area is directly between, and directly adjacent to, the Taxi-Lane and the Hotel-Shuttle/Limo-Lane waiting & pickup area.

This general area and use of the stairway cannot be completely closed to public access during normal daytime business hours. Public access to the stairway can be temporarily channelized to (concentrated in) the center portion of the stairway while maintaining a wide public use path on both sides of the center railing as indicated on the Plans.

The Handicap Access Ramp that is adjacent and integral to the north side of the stairway may be closed to public access for concurrent work with the stairway wall repairs at certain times and durations during business hours to be determined by the Owner. The Owner will provide and erect signage as necessary to re-direct pedestrians requiring ramp access to utilize the Pedestrian Bridge walkway via the elevators on each end respectively, at the Parking Garage and inside the Terminal building.

For any work performed during hours when public access is active, the Work Areas must be captured with appropriate isolation including construction warning signage and barricades / shielding to protect adjacent public from construction hazards including surfaces with curing materials/coatings. The performance of the work shall be coordinated with the Owner.

B. Products

1. Materials to be utilized shall be compatible with the existing site conditions and shall conform to the Contract Plans and Specifications, and/or supplementary details and specifications.
2. Materials to be utilized under Work Item 9.1 that are not covered by approved product data submittals made for other Work Item materials in the Contract shall be submitted separately to the Engineer for approval.
3. Cementitious Repair Mortar for cast-in-place reconstruction of the top of the retaining walls adjacent to the stairway shall be self-consolidating high-early strength with corrosion inhibitor and shall conform to Specification Section 03732 ss 2.1.A as described therein for Work Item 2.1.

C. Procedures

1. Submit product data for materials to be used including manufacturer Product Data Sheets and Installation Instructions, and MSDS /SDS Sheets.
2. Coordinate scheduling, access, and capture provisions of the limits of work areas at least two weeks in advance with the Engineer and Owner prior performing any work.
3. Demolition work shall be done in such a manner as to minimize duration of noise and quantity of errant dust and debris in this area. Cleanup and remove debris and heavy dust from the work area each day. Provide localized shielding as required during demolitions and other activities to prevent flying debris from entering publicly accessible areas. Concrete demolition shall be done with 15-lb class pneumatic hammers or electric chipping hammers.
4. Concrete repairs shall be performed in the beginning phases of the project schedule and sufficient curing time for cementitious patching materials, as specified by the manufacturer's instructions and approved by the Engineer, shall be allowed after material placement before re-capture of work areas and application of traffic coatings or other work.

9.2 Field Item – Not Used

9.3 Field Item – Not Used

9.4 Field Item – Not Used

9.5 Field Item Allowance – General

A. Scope of Work

This Work Item consists of any additional repairs, replacements, or modifications of miscellaneous existing parking garage components which are not covered by any other Work Item or Allowance. This work will be defined in the field as directed by the Engineer or the Owner. This work may be required to be performed in any area or level of the parking garage ss directed by the Owner or Engineer. The Owner may request additional repairs of the same or similar nature to the base bid items (concrete repairs, sealants, waterproofing, etc.) for other areas of the Airport facilities under this allowance. The Owner/Engineer will provide work area capture instructions as appropriate for any work outside of the planned work area capture. The work shall be quoted by the Contractor and approved by the Owner prior to performance, and shall incorporate all necessary provisions to complete the associated work including:

1. Locating, marking, and reviewing with Engineer all areas to receive work.
2. Measuring areas with Engineer for Payment Application. Contractor shall record work performed and limits on as-Built plans.
3. Payment for the proposed miscellaneous work which would not be applicable to the other Bid Work Items, shall be performed under Item 9.5 - Field Item Allowance - General. Payment for such work shall be made for each individually designated / repair area or specifically defined group of similar repairs on a pre-negotiated mutually agreed upon LUMP SUM or UNIT COST basis for that work. Owner or Engineer will designate limits and scope of each repair area in writing prior to Contractor's proposal of the work. Contractor shall submit a written Quote anticipated for each designated repair area for review and approval prior to commencement of work.
4. Furnish and install all labor and materials to perform the directed work.
5. Restoring the affected areas for use by Owner.
6. The Owner may at its sole discretion, based on field conditions or other considerations, redistribute (reduce) all or part of the Field Item Allowance to

provide additional contract item quantities.

B. Products

4. Materials to be utilized shall conform to the existing site conditions, the Contract Plans and Specifications, supplementary details and specifications, or product data provided by the Owner or Engineer in the field or as requested by the Engineer.

C. Procedures

5. Submit product data as applicable / requested for materials to be used in directed repairs or replacements.
6. Each specifically requested Field Item repair, replacement, or modification will be identified by the Engineer and assigned a Sub-Work Item Number in chronological order: Work Item 9.5.A, 9.5.B, 9.5.C, etc. The Contractor's application for payment shall reflect the Sub-Work Item Number assigned and related costs individually.

END OF SECTION 02000

SECTION 02840

TRAFFIC DELINEATORS

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS AND RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, apply to this Section.
- B. Where referred to, Standard Specification of Technical Societies, Manufacturer's Associations and Federal Agencies shall be the latest edition and include all amendments currently as of the date of the issue of these Specifications.

1.2 SUMMARY

- A. This Section specifies the products and materials to be provided under Work Item 8.3 – Bollards & Traffic Control – Provide Traffic Delineator Devices, and the installation and testing requirements required for work performed under Work Item 8.4 – Bollards & Traffic Control – Install Traffic Delineator Devices.
- B. Work shall include furnishing all labor, materials, and incidentals required to prepare existing conditions, provide all products and materials, and install Traffic Delineators as called for on the Contract Drawings or as directed by the Engineer and Owner.

- C. Related Sections include the following:

Division 3 Section 03732 “Concrete Repair”

Division 7 Section 07920 “Joint Sealants”

Division 7 Section 07180 “Traffic Coatings”

Division 7 Section 07190 Penetrating Concrete Sealer With Migrating Corrosion Inhibitor (MCI)

1.3 REFERENCES

- A. U.S Federal Highway Administration (FHWA) , Manual of Uniform Traffic Control Devices (MUTCD)

1.4 SUBMITTALS

- A. After work is complete, Contractor shall submit record status drawings indicating locations where Traffic Delineators have been installed in accordance with the General Requirements Section 1.1.

- B. Product Data: Submit full manufacturer's product data and installation instructions for each Traffic Delineator related material, including post, base unit assembly, and recommended surface mounting adhesive. Submit manufacturer's data including: materials, thicknesses, dimensions, standard details and recommendations, storage-handling-installation methods, cleaning, touch-up, and maintenance instructions.
- C. Contractor shall site-review the field conditions and coordinate with the manufacturer's representative to verify installation procedures and materials compatibility prior to installation areas preparation and submit manufacturer's written recommendations to the engineer for record.
- D. Submit warranty as identified in Part 3, Section 3.5

1.5 QUALITY ASSURANCE

A. General

- 1. The Manufacturer shall provide evidence of satisfactory production of same or similar product(s) for a period of not less than five years.

1.6 DELIVERY, STORAGE, AND PROTECTION

- A. Deliver all materials to the site in original, unopened containers bearing the following information:

Manufacturer's brand name.

Type of material.

Directions for storage.

Date of manufacture and shelf life.

Lot or batch number.

Installation instructions.

- B. Store materials on blocks or skids under cover and protect from weather. Replace packages or materials showing any signs of damage with new materials at no additional cost to the Owner.

PART 2 - PRODUCTS

2.1 TRAFFIC DELINEATORS

- A. Traffic Delineators shall be heavy-duty high-performance surface-mounted flexible rebounding tubular marker delineator (channelizer) posts specifically designed to be utilized in high speed and high traffic areas, and shall be MUTCD compliant. The Traffic Delineator components shall meet or exceed the following characteristics:

1. Tubular posts shall be 3" diameter (round full height). Tube material shall be UV-stabilized impact-resistant color-impregnated HDPE or proprietary flexible polymer extrusion intended for this use. Tops of the tubular posts shall be closed (securely capped) and all sharp edges shall be removed.
 2. Color: WHITE. Traffic Delineator post color shall be White and shall have two (2) 3-inch wide strips of yellow high-intensity retroreflective adhesive sheeting (tape) wrapped around the full circumference of the post. The top of the upper strip shall be located at 3" down from the top of the post, and the top of the lower strip shall be located at 3" below the upper sheeting. Retroreflective sheeting shall be compliant with ASTM 4956.1 standards.
 3. Post hinge assembly/mechanism shall be designed to rebound back to vertical position after full deflection of the post to the ground surface without deformation or vertical listing. Connection hardware and other metal components shall be corrosion resistant, zinc plated or stainless steel with locking nuts or lock washers.
 4. Mounting base shall be a minimum of 8" in diameter or 8"x8" square, and specifically designed to be a fixed surface mount utilizing epoxy adhesive.
 5. Height: 42". The installed Traffic Delineator assembly shall be 42" tall.
 6. The Traffic Delineator assembly shall have been crash-tested for durability to withstand a minimum of 50 repeated vehicular impacts at a speed of 55 mph, while rebounding to vertical position with little or no damage, deformation, or vertical listing. Provide manufacturer's statement confirming crash-testing performance with the product data submittal.
- B. Traffic Delineators shall be surface mount anchored to the parking garage floor with epoxy adhesive. The Epoxy adhesive shall be furnished by, or specified by, the Traffic Delineator Manufacturer to be specifically compatible with their product (mounting base). The epoxy adhesive shall be delivered to the site in sufficient quantity to install the number traffic delineators provided, as an integral part of Work Item 8.3 – Bollards & Traffic Control – Provide Traffic Delineator Devices. The Contractor shall coordinate the field conditions with the Traffic Delineator Manufacturer and/or the Epoxy Adhesive Manufacturer to ensure adequate adhesive bond strength to the substrate will be achieved. Traffic Delineator bases will be adhered to the garage floor in various locations that will have differing surface conditions, including the following:
1. Concrete: The general floor area of the parking garage consists of 4" thick precast concrete double-tee elements that have a heavy broom finish. The surface of the precast floor will be cleaned (shot blasted) and subsequently sealed with a penetrating concrete sealer under Work Item 2.8. Traffic Delineator mounting bases may be installed after shot blasting and prior to application of the concrete sealer if required to achieve adequate epoxy bonding to the floor.

2. Traffic Coatings: Some areas throughout the garage will receive traffic coatings under Work Items 2.7A, 2.7B, 2.7J as detailed on the Plans and as directed by the Engineer. Traffic Delineators will be mounted on top of the traffic coating material.
 3. Pavement Markings: Traffic paint will be applied, as shown on the Plans under Work Item 2.9, to various areas of the exposed concrete garage floor and areas that will have received traffic coatings. Coordinating and masking off localized areas to receive Traffic Delineators (base contact area + 2" only) shall be performed by the Contractor subsidiary to the Pavement Markings Work.
- C. Subject to compliance with requirements and availability, pre-accepted products that are to be incorporated into the work include the matching product previously installed in the parking garage :
1. FLEXSTAKE 750 Series Tubular Marker Delineator, as manufactured by Roadtech Manufacturing Inc., 1900 N. Austin Ave Suite 209, Chicago, Illinois 60639
 2. BOOMERANG Surface Mount Reboundable Delineator TD5200 Series as manufactured by Three D TrafficWorks, a division of ThreeD Plastics, Inc
 3. Or Equal as approved by the Engineer.

PART 3 - EXECUTION

3.1 INSPECTION

- A. General:
1. Contractor shall locate, mark, and subsequently review all locations to receive Traffic Delineator Devices with the Engineer and Owner's Representative prior to beginning surface preparations for installation.
 2. Inspect surfaces to receive the work of this Section and report immediately in writing to the Engineer any deficiencies in the surface preparation, which render it unsuitable for proper execution of the work.
 3. Coordinate with related work to verify the following requirements:
 - a. Prepared Concrete surfaces are finished appropriately to receive the work.
 - b. Any adjacent repaired concrete surfaces have endured the proper curing period.

3.2 PREPARATION

- A. Surfaces of localized areas to receive installation of Traffic Delineator Devices shall be swept, cleaned with detergent solution and bristle brush, rinsed, and dried. Cleaning shall be performed immediately prior to base mounting adhesive application. Areas exhibiting signs of oil or grease contamination shall be cleaned with appropriate solvent. Areas for mounting where traffic coatings exist shall be gently wiped with xylene after detergent cleaning. Surface preparation of bare concrete may require grinding to remove excessive roughness or laitance.
- B. Coordinate with the epoxy adhesive manufacturer to confirm all surface preparation requirements. Perform all surface preparations in accordance with the epoxy manufacturer's recommendations.

3.3 INSTALLATION

- A. Complete all work as shown on the Contract Drawings and described in these Specifications in strict accordance with the Product Manufacturer's written installation instructions and specifications including, but not limited to, assembly and mounting of the Traffic Delineator Devices, mounting surface preparation, mixing and application of epoxy adhesive(s).

3.4 TESTING

- A. The installed Traffic Delineators shall be tested for mounting adhesion integrity by the Contractor after the cure period of the adhesive. The test shall be performed by the Contractor in the presence of Engineer or the Owner's Representative. The Contractor shall notify Engineer and Owner 48 hours in advance of the test.
- B. Traffic Delineator mounting adhesion testing shall consist of applying an upward lifting force of approximately 50 lbs, and a 45 degree laterally applied pulling force of approximately 50 lbs. Each Traffic Delineator shall also be fully flexed to contact the floor and shall rebound to its original position without deformation or misalignment.

3.5 GUARANTEE/WARRANTY

- A. General Warranty: Special warranty specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
- B. Manufacturer's Warranty: Provide written evidence of manufacturer's standard or special warranty of Two (2) years from date of delivery to site for Defects in Material or Workmanship, including statements confirming coatings that will not peel, crack, or significantly change color within the warranty period.

- B. Damage inflicted by vandalism or abnormal maintenance equipment, is not considered normal traffic use; therefore, damages inflicted by these causes are exempted from Warranties under this Section.

END OF SECTION 02840

SECTION 03700

EMBEDDED GALVANIC ANODES

PART 1 GENERAL

1.1 DESCRIPTION

- A. Embedded galvanic anodes are a means of providing cathodic protection to reinforced concrete structures. The system consists of anode discs which come in various shapes and sizes and are embedded into fresh concrete and concrete repairs and connected electrically to the reinforcing steel. Once installed, the zinc anode corrodes preferentially to the surrounding rebar, thereby providing galvanic corrosion control or cathodic protection to the adjacent reinforcing steel.

1.2 REFERENCES

- A. ACI 222R Protection of Metals in Concrete Against Corrosion
- B. ACI 562-13 Code Requirements for Evaluation, Repair and Rehabilitation of Concrete Buildings
- C. ASTM B6 Standard Specification for Zinc
- D. ASTM B69 Standard Specification for Rolled Zinc
- E. ICRI 03732 Guideline for Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, and Polymer Overlays

1.3 BID QUANTITY

The Base Bid quantity is estimated based on prior similar work and is intended to cover the locations for installation to be designated by the Engineer in the field similar to as shown on the drawings, and as otherwise directed by the Engineer in accordance with the material manufacturer's recommendations.

1.4 SUBMITTALS

- A. Product Data Sheets and Installation Instructions.
- B. The installation plan including anode layout and spacing, means and methods for rebar and anode connections, and means and methods for testing and correction of electrical discontinuities shall be as indicated on the plans and by the Engineer in the field and as recommended by the product manufacturer and approved by the Engineer.

PART 2 PRODUCTS

2.1 EMBEDDED GALVANIC ANODES

Embedded galvanic anodes shall be Anode Type 1A Class P with the following nominal dimensions: 4.9 in. long by 1.0 in. wide by 1.0 in. deep (125 mm x 25 mm x 25 mm). The anodes shall be pre-manufactured with a nominal 60 grams of zinc in compliance with ASTM B418 Type II cast around a single uncoated, non-galvanized steel tie wire which extends from the anode in two locations and encased in a highly alkaline cementitious shell with a pH of 14 or greater.

The galvanic anodes shall be alkali-activated and shall contain no intentionally added chloride, bromide or other constituents that are corrosive to reinforcing steel as per ACI 562-13. Anode units shall be supplied with integral un-spliced wires for directly tying to the reinforcing steel. Embedded galvanic anodes shall be Galvashield XPT available from Vector Corrosion Technologies or approved equal.

Application for approved equals shall be requested in writing two weeks before submission of project bids. Application for galvanic anode approved equals shall include verification of the following information:

- a. The zinc anode is alkali-activated with an alkaline cementitious shell with a pH of 14 or greater.
- b. The galvanic anode shall contain no intentionally added constituents corrosive to reinforcing steel, such as chloride, bromide, etc.
- c. The anode manufacturer shall provide documented test results from field installations showing that the anodes have achieved a minimum of 10 years in service.
- d. The galvanic anode units shall be supplied with solid zinc core (ASTM B418) cast around a single uncoated, non-galvanized, non-spliced steel tie wire for wrapping around the reinforcing steel and twisting to provide a durable steel to steel connection between the tie wire and the reinforcing steel.

2.2 CONCRETE REPAIR MATERIALS

Concrete repair materials shall be compatible with the galvanic anode system as approved by the anode manufacturer. Compatible repair materials shall be pre-packaged hydraulic-cement based mortar or concrete with 28-day moist cured electrical resistivity less than 15,000 ohm-cm.

Repair materials containing magnesium phosphate, or high levels of supplementary cementitious materials such as silica fume, ground-granulated blast furnace slag or flyash may not meet this resistivity requirement. Epoxy mortars or bonding agents shall not be permitted where anodes are to be used.

2.3 STORAGE

Deliver, store, and handle all materials in accordance with manufacturer's instructions. Anode units shall be stored in dry conditions in the original unopened containers in a manner to avoid exposure to extremes of temperature and humidity.

PART 3 EXECUTION

3.1 MANUFACTURER TECHNICAL ASSISTANCE

- A. **If the Contractor is not prior-certified by the manufacturer in the installation of the required products or cannot provide documentation of manufacturer certification**, then the contractor shall enlist and pay for a NACE-qualified Cathodic Protection Technician working under the direction of a NACE-qualified Cathodic Protection Specialist and employed by the anode supplier who shall provide technical site support during the initial installation of the galvanic protection system.
- B. The Cathodic Protection Technician shall develop and oversee QA/QC procedures for the installation of the galvanic system approved by the Cathodic Protection Specialist. The Cathodic Protection Technician and Cathodic Protection Specialist shall have verifiable experience in the installation and testing of galvanic protection systems for reinforced concrete structures.
- C. The work shall be coordinated with the designated Cathodic Protection Technician to allow for site support during project startup and initial anode installation. The technician shall provide training and support for development of application procedures, quality control program, surface preparation, anode installation, reinforcing steel connection procedures, and electrical continuity verification of embedded reinforcing steel.

3.2 CLEANING AND REPAIR OF REINFORCING STEEL

- A. Clean exposed reinforcing steel of rust, mortar, etc. to provide sufficient electrical connection and mechanical bond.
- B. If significant reduction in the cross section of the reinforcing steel has occurred, replace, or install supplemental reinforcement as directed by the Engineer.

- C. Secure loose reinforcing steel by tying tightly to other bars with steel tie wire.
- D. If the reinforcing steel is to receive a barrier coating, do not coat the reinforcing steel within 1 in. (25mm) of the anode and do not apply coating to any surface of the anode or the steel tie wires.

3.3 EDGE AND SURFACE CONDITIONING OF CONCRETE

- A. Concrete patches shall be square or rectangular in shape with squared corners per ICRI Guideline 310.1R-2008.
- B. Saw cut the patch boundary 1/2 inch (13 mm) deep or less if required to avoid cutting reinforcing steel.
- C. Create a clean, sound substrate by removing bond-inhibiting materials from the concrete substrate by high pressure water blasting or abrasive blasting.

3.4 GALVANIC ANODE INSTALLATION

- A. Install anode units and repair material immediately following preparation and cleaning of the steel reinforcement.
- B. Galvanic anodes shall be installed along the exposed reinforcing bars as directed at a maximum spacing of 24 inches.
- C. Place the galvanic anodes as close as possible to the patch edge while still providing sufficient clearance between anodes and substrate to allow the repair material to fully encase the anode with a minimum concrete or mortar cover over the anode of 1 in. (25mm). If necessary, increase the size of the repair cavity to accommodate the anodes.
 - 1. Place the anode along a single bar or at the intersection between two bars and secure to each clean bar.
 - 2. If less than 1 in. (25 mm) of concrete cover is expected, place anode beneath the bar and secure to clean reinforcing steel.
- D. Wrap each end of the tie wire around the clean reinforcing steel at least one full turn in opposite directions, one clockwise and the other counterclockwise. Bring the two free ends together and twist tight for secure connection.
- E. If repair materials with resistivity greater than 15,000 ohm-cm are to be used or if the resistivity is unknown, pack Galvashield Embedding Mortar between the anode and the substrate concrete to create a conductive grout

bridge ensuring no voids exist.

CONCRETE OR MORTAR PLACEMENT

- A. If the repair procedures require the concrete surface to be saturated with water, do not damage the anode nor allow the anode units to be soaked for greater than 20 minutes.
- B. Complete the repair with the repair material, taking care not to damage, loosen or leave voids around the anode.

END OF SECTION 03700

SECTION 03732

CONCRETE REPAIR

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS AND RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, apply to this Section.
- B. The Contractor shall coordinate work with that of other trades affecting or affected by the work included under this Section and shall cooperate with such trader, the Testing Agency, the Engineer, and the Owner to assure steady and timely progress of the work.
- C. The Contractor agrees to accept the results of any tests secured by a qualified Testing Agency.
- D. Where referred to, Standard Specification of Technical Societies, manufacture's associations and federal agencies shall be the latest edition and include all amendments currently as of the date of the issue of these Specifications.

1.2 SUMMARY

- A. Concrete repair shall be as indicated on the drawings, details, and Section 02000 "Work Item Scopes". The related work items include:
 - a. Work Item 2.1 - Floor Repair – Full Depth at C.I.P Concrete Wash - Drive Bays
 - b. Work Item 2.2 - Floor Repair – Partial Depth at C.I.P. Concrete Wash
 - c. Work Item 2.3 - Floor Repair - Partial Depth at Precast Concrete Floor Slab
 - d. Work Item 3.4 - Ceiling Repair – Overhead Concrete Mortar Repair
- B. The limits of each concrete repair surface shall be located, identified, and marked by the Engineer for field review with the Contractor prior to the commencement of the work. Payment will only be made for pre-established areas as approved by the Engineer.
- C. Related Sections include the following:
 - 1. Division 7 Section 07920 "Joint Sealants"

2. Division 7 Section 07180 "Traffic Coatings"

1.3 REFERENCES

- A. ASTM C33 - Specifications for Concrete Aggregates
- B. ASTM C150 - Portland Cement
- C. ASTM C882 - Bond Strength of Epoxy Resin Systems Used with Concrete

1.4 SUBMITTALS

- A. Product Data: For each repair product indicate product standards, physical and chemical characteristics, technical specifications, limitations, maintenance instructions, and general.
- B. Manufacturer's Certificate: Certify that specified products meet or exceed specified requirements.

1.5 QUALITY ASSURANCE

- A. Materials Manufacturer: Company specializing in manufacturing the products specified in this Section with minimum ten (10) years documented experience.
- B. Applicator: Company specializing in concrete repair with minimum five (5) years documented experience approved by manufacturer.
- C. The Engineer may request the services of the supplied products manufacturer's representative to instruct the Project Superintendent, Foreman and all personnel that will be involved with the placement and surface preparation of proper placement procedures at the start of the project and may request random visits during the project to verify that proper placement procedures are being followed.

1.6 DELIVERY, STORAGE, AND PROTECTION

- A. Transport, handle, store, and protect products in accordance with the manufacturer's recommendations.
- B. Comply with instructions for shelf-life limitations.

PART 2 - PRODUCTS

2.1 REPAIR MATERIALS

- A. “Cementitious Repair Mortar” material for Drive Bay Jointline Rebuild Areas Work Item 2.1- Floor Repair – Full Depth at C.I.P Concrete Wash - Drive Bays which are at least 2” deep and may be placed monolithic to some formed ceiling repairs areas below shall be a pourable and pumpable pre-extended self-consolidating repair mortar with integral corrosion inhibitor with high early strength. The mortar shall achieve a compressive strength of at least 2,000psi after in 24 hours and at least 5,000psi in 28 days.

Subject to submittals and compliance with requirements, pre-accepted products that may be incorporated into the work include the following:

1. MasterEmaco S 440CI as manufactured by BASF
2. Sikacrete 211 SCC Plus as manufactured by Sika Corporation
3. EucoRepair SCC as manufactured by Euclid Chemical Company
4. Equivalent Product as Approved by the Engineer

- B. “Polymer-Modified Cementitious Repair Mortar” material for Partial Depth Floor Repairs which are small/shallow, being at least 1/4” deep as called for under Work Item 2.2 - Floor Repair – Partial Depth at C.I.P. Concrete Wash shall be non-extended (neat) one or two component, early strength, polymer-modified cementitious repairing material with integral corrosion inhibitor for horizontal repair of concrete.

Subject to submittals and compliance with requirements, pre-accepted products that may be incorporated into the work include the following:

1. SikaTop 122 PLUS as manufactured by Sika Corporation
2. EMACO R310-CI as manufactured by BASF Construction Chemicals, LLC
3. Equivalent product as Approved by the Engineer

- C. “Cementitious Repair Mortar” material for Partial Depth Floor Repairs which are up to approximately 1” +/- deep, as called for under Work Item 2.3 (If needed as determined by the Owner’s representative during the project) in Section 02000, shall be one component, early strength, cementitious repairing material for horizontal repair of concrete.

Subject to submittals and compliance with requirements, pre-accepted products that may be incorporated into the work include the following:

1. RoadPatch or RoadPatch 2000 as manufactured by Sika Corporation
2. EMACO T415 or T430 as manufactured by BASF Construction Chemicals, LLC
3. Equivalent product as Approved by the Engineer

- D. "Cementitious Repair Mortar" material for Overhead Concrete Mortar Repairs that are called for under Work Item 3.4 in Section 02000, shall be one-component or two-component, polymer-modified, high-strength, fast-setting, shrinkage compensated, cementitious, non-sag repairing mortar for vertical and overhead repair of concrete. The repair mortar shall achieve at least 3,000 psi compressive strength in 24 hours and the final (28 day) compressive strength shall be 6,000 psi or greater. The mortar mix shall also contain the benefit of a penetrating corrosion inhibitor if available and recommended for the product and furnished from the same manufacturer.

Subject to submittals and compliance with requirements, pre-accepted products that may be incorporated into the work include the following:

1. SikaTop 123 Plus as manufactured by Sika Corporation
 2. HD-25 VO as manufactured by Dayton Superior Corporation
 3. MasterEmaco N 425 as manufactured by BASF Corporation
 4. EucoRepair V100 as manufactured by the Euclid Chemical Company
 5. Equivalent product as Approved by the Engineer
- E. Bonding agent / epoxy coating for reinforcing protection which shall be applied to all concrete surfaces and reinforcing steel to receive repair mortars shall be the repair mortar manufacturer's recommended bonding agent product or as directed by the Engineer. Brush coatings of repair mortars shall not replace application of bonding agent materials unless approved by the Engineer.

Subject to submittals and compliance with requirements, pre-accepted products that may be incorporated into the work include the following:

1. Sika Armatec 110 EpoChem as manufactured by Sika Corporation
 2. EMACO P24 bonding Adhesive as manufactured by BASF Corporation
 3. Equivalent product as Approved by the Engineer
- F. Reinforcing Steel as required for any concrete work shall conform to ASTM A615, Grade 60 and shall be clean and free of surface rust.
- G. Adhesive for setting rebar dowels or anchor bolts shall be subsidiary to the work and shall be either cementitious non-shrink, fast-set, non-metallic, grout ($f_c' = 9000$ psi/28 day) conforming to ASTM C130 or epoxy adhesive specifically formulated for the purpose of anchoring rebar dowels as manufactured by Sika Corporation, Simpson Strong-Tie Co., Inc. or approved equal, and as directed by the Engineer.

PART 3 - EXECUTION

3.1 APPLICATION

- A. At all spall locations remove all deteriorated concrete, dirt, oil, grease, and all other bond inhibiting materials from surface down to sound concrete.
 - 1. Power driven hand tools for removal of sound and unsound concrete shall be subject to the following restrictions:
 - a. All demolition shall be executed by handheld 15-pound class hammers, electric chipping hammer / scaler, or pneumatic scabblers.
 - b. Care shall be exercised to prevent cutting, stretching or damaging any existing reinforcing.
 - c. Shoring, work platforms and work areas separations required for the protection of the public and the facility shall be the responsibility of the Contractor.
- B. At slab surface repair locations where reinforcing is exposed, chip along corroded rebar until clean bar is exposed at both ends. If exposed rebar is corroded less than 50 percent of its circumference and is still fully bonded to surrounding sound concrete, no additional demolition will be required around reinforcing. If exposed rebar is corroded more than 50 percent of its circumference, chip around bar a minimum of 3/4 inch. Clean reinforcing by wire scabbling, or power brush around exposed rebar to remove all traces of rust down to white steel.
- C. Saw cut edges of repair areas on horizontal floor surfaces for minimum 1 inch edge depth.
- D. Grind edges of vertical and overhead repair areas for a minimum 1/4" edge depth.
- E. Prepare surface of repairing area to obtain an aggregate fractured surface with a minimum surface profile of 1/4 inch by scabbler, bush hammer or other mechanical means.
- F. Mechanically clean and saturate surfaces of areas to be repaired by sand blast or water blast. Saturate surfaces and allow to dry until damp. Brush-apply coat of manufacturer's recommended compatible epoxy bonding agent on areas of surface to receive concrete repair mortar materials.
- G. Mix and Apply repair materials in strict conformance to manufacturer's recommended procedures.

H. Mix and Apply vertical and overhead repair mortar in neat method. Do not extend materials with aggregate unless approved by the Engineer.

I. Cover existing reinforcing with a minimum $\frac{3}{4}$ " cover.

J. Finish to match adjacent surfaces.

3.2 CURING

A. Curing procedures and durations shall be in strict compliance with concrete repair mortar manufacturer's instructions.

3.3 FIELD QUALITY CONTROL

A. Quality control shall be in accordance with the requirements of "General and Supplementary Conditions".

END OF SECTION 03732

SECTION 03930

EPOXY INJECTED CRACK REPAIRS

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS AND RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, apply to this Section.
- B. The Contractor shall coordinate work with that of other trades affecting or affected by the work included under this Section and shall cooperate with such trader, the Testing Agency, the Engineer, and the Owner to assure steady and timely progress of the work.
- C. The Contractor agrees to accept the results of any tests secured by a qualified Testing Agency.
- D. Where referred to, Standard Specification of Technical Societies, manufacture's associations and federal agencies shall be the latest edition and include all amendments currently as of the date of the issue of these Specifications.

1.2 SUMMARY

- A. This work consists of epoxy-injected crack repair for cracks in concrete that are ¼” or less in width as indicated on the drawings, details, and Section 02000 “Work Item Scopes” for Work Item 3.3 – Ceiling Repair – Epoxy Crack Injection. The cracks to be repaired may be in the horizontal, vertical, and overhead orientation as directed by the Engineer.
- B. The limits of each crack to be repaired shall be located, identified, reviewed, marked and measured by the Engineer with the Contractor prior to the commencement of the work. Payment will only be made for pre-established areas as approved by the Engineer.
- C. This work includes furnishing and injecting structural epoxy resin into cracks. All elevated work access, surface preparations / cleaning, drilling for and installing injection ports, surface sealing with epoxy paste, resin injection, injection ports removal, and surface grinding to a texture acceptable to the Owner, are subsidiary to the work.

D. Related Sections include the following:

1. Division 3 Section 03732 "Concrete Repair"
2. Division 7 Section 07920 "Joint Sealants"
3. Division 7 Section 07180 "Traffic Coatings"

1.3 REFERENCES

A. ASTM C881 - Epoxy Resin Based Bonding Systems for Concrete

1.4 SUBMITTALS

- A. Product Data: For each repair product indicate product standards, physical and chemical characteristics, technical specifications, limitations, maintenance instructions, and general recommendations regarding each material.
- B. Manufacturer's Certificate: Certify that specified products meet or exceed specified requirements.
- C. Qualification Data: For installers.
1. For products required to be installed by workers approved by product manufacturers, include letters of acceptance by product manufacturers certifying that installers are approved to apply their products and include evidence of effective epoxy pressure injection service for at least five years.

1.5 QUALITY ASSURANCE

- A. Materials Manufacturer Qualification: Company specializing in manufacturing the products specified in this Section with minimum five (5) years documented experience.
- B. Contractor/Sub-Contractor Applicator Qualification: Company specializing in concrete repair with minimum five (5) years documented experience including structural epoxy injection work and acknowledged as an approved Contractor/Applicator by the product manufacturer.
- C. Workman's Qualification: Work shall be performed/supervised by a manufacturer approved/licensed applicator that has received and satisfactorily completed a documented program of instruction (manufacturer's training) in the use of the injection system equipment and materials.

1.6 DELIVERY, STORAGE, AND PROTECTION

- A. Transport, handle, store, and protect products in accordance with the manufacturer's recommendations. Materials shall be delivered to the site in the original unopened containers and packaging with labels intact.
- B. Comply with instructions for shelf life limitations and instructions for minimum and maximum temperature requirements and other conditions for storage.

PART 2 - PRODUCTS

2.1 EPOXY CRACK INJECTION ADHESIVE

- A. Crack Injection Adhesive Resin: ASTM C 881/C 881M, Type IV, Grade 1.

Subject to submittals and compliance with requirements, pre-accepted products that may be incorporated into the work include the following:

- 1. ChemCo Systems; CCS Injection, Low Viscosity.
- 2. Dayton Superior Corporation; Sure-Inject (J-56).
- 3. Euclid Chemical Company (The); Eucopoxy Injection Resin.
- 4. Kaufman Products, Inc.; Surepoxy HM-SLV.
- 5. Meadows, W. R., Inc.; Sealtight Rezi-Weld LV.
- 6. Sika Corporation; Sikadur 35, Hi-Mod LV.
- 7. Tamms Industries, Inc.; Duralcrete LV.

- B. Capping Adhesive Paste: ASTM C 881/C 881M, Type IV, Grade 3 or as specified and provided by the Crack Injection Adhesive Resin manufacturer for use with their injection product (system) for this application.

PART 3 – EXECUTION

3.1 CONSTRUCTION REQUIREMENTS

- A. The details of the injection procedure shall be submitted for the Engineer's approval.
- B. The Contractor shall advance-coordinate the work with the epoxy injection system manufacturer, including informing the manufacturer of the specific site conditions by means of written/documented communications including photographs, or a site visit by the manufacturer's representative shall be scheduled in advance to include attendance by the Engineer. If the site conditions warrant, in the opinion of the manufacturer or the Engineer, then it may be required to have a manufacturer's technical representative present for the duration of the injection process.

- C. Components 'A' and 'B' shall be mixed in accordance with the manufacturer's recommendations. The ratio of the components shall be maintained within a tolerance of five percent or as recommended by the manufacturer.
- D. The equipment shall be capable of providing a continuous and uninterrupted pressure head to continually force the injection of epoxy into the cracks.
- E. All personnel shall be familiar with the equipment, materials and procedures to be used during the operation.
- F. Any solvent used for cleaning shall be non-chlorinated. Acceptable solvents are mineral spirits, methyl ethyl ketone, acetone, low boiling naphtha, xylene or any other non-chlorinated solvent.

3.2 SURFACE SEAL AND PORT INSTALLATION

- A. Prior to injection of the epoxy in the crack, the crack-line shall be routed 1" beyond the end of visible defect and a surface seal material shall be applied to the face of the crack so that the liquid resin will not leak and flow out of the crack prior to gelling and curing. Surface seal material shall be capable of being used on both vertical and horizontal surfaces.
- B. In order to inject the epoxy material through the surface seal, openings with entry ports shall be provided along the crack at a spacing of 6 to 12 inches maximum along the crack or at spacing as recommended by epoxy manufacturer. A minimum of two (2) injection ports per crack shall be installed.

3.3 INJECTION PROCEDURES

- A. No epoxy injection or surface sealing shall be done when the concrete temperature or ambient temperature is, or is expected to fall, below 50 degrees Fahrenheit or the manufacturer's published recommendation, during the 24 hours following the time of epoxy injection.
- B. Special care shall be exercised to assure that oil or other contaminants will not be introduced into the air feed hoses, or deposited on any air blown surfaces.
- C. The epoxy material shall be forced into the internal voids and cracks by means of hydraulic pressure so that all internal voids are completely filled.

- D. Injection of epoxy shall begin at the lowest entry port on a vertical surface or at a side entry port on a horizontal surface and continue until there is an appearance of epoxy at the entry port directly above or adjacent to the entry port being pumped.
- E. The injection procedure shall be monitored to assure the epoxy flow does not stop before the injected epoxy exudes from the adjacent port. When the epoxy flows from the adjacent port, injection shall be stopped, the feed line removed from the port, and the port sealed. The feed line shall then be attached to the next port and the procedure repeated until the last port is sealed. If the epoxy flow stops before epoxy appears at the adjacent port, the feed line shall be moved to the adjacent port and the port just used shall be sealed.
- F. During the course of all operations, extreme care shall be given to observe for breaking of the surface seal. If such a break occurs, the injection line shall be moved to some other part of the structure. Injecting may be resumed in the original location after the elapse of 14 hours.
- G. After the fractured area has been filled and the epoxy has partially cured (24 hours at ambient temperature not less than 60 degrees F, otherwise not less than 48 hours), the injection ports shall be removed flush with concrete surface. Then, the surfaces of the repaired area shall be abraded to achieve a reasonably uniform texture. Any epoxy runs or spills shall be removed from concrete surfaces. Any damage to the concrete during the cleanup procedure shall be repaired by the Contactor in a manner satisfactory to the Engineer at no additional cost to the Owner.

3.4 FIELD QUALITY CONTROL

- A. The Contractor shall coordinate with the Engineer for observation of the prepared cracks to be injected in advance of the injection work.
- B. Epoxy resin crack injection shall be performed in the presence of the Engineer, or both the Owner's Representative and the Manufacturer's Representative. Contractor shall give 48 hours' notice prior to beginning epoxy injection operations.
- C. Quality control shall be in accordance with the requirements of "General and Supplementary Conditions.

END OF SECTION 03930

SECTION 03933

PENETRATING CORROSION INHIBITING IMPREGNATION COATING

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS AND RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, apply to this Section.
- B. The Contractor shall coordinate work with that of other trades affecting or affected by the work included under this Section and shall cooperate with such trades, the Testing Agency, the Engineer, and the Owner to assure steady and timely progress of the work.
- C. The Contractor agrees to accept the results of any tests secured by a qualified Testing Agency.
- D. Where referred to, Standard Specification of Technical Societies, manufacture's associations and federal agencies shall be the latest edition and include all amendments currently as of the date of the issue of these Specifications.

1.2 SUMMARY

- A. This specification describes the treatment of hardened concrete surfaces with a penetrating corrosion inhibitor to reduce the effects of corrosion in reinforced concrete.
- B. Penetrating Corrosion Inhibiting Impregnation Coating shall be as indicated on the plans, repair details, and in Section 02000 "Work Item Scopes" as Work Item 3.6 Ceiling Repair – Migratory Corrosion Inhibitor.
- C. The limits of the surfaces to be sealed shall be confined to the underside horizontal and vertical surfaces of the ends of the precast concrete double-tee floor element flanges and stems as identified on the drawings and reviewed in the field with and approved by the Engineer prior to the commencement of the work. Payment will only be made for pre-established areas as approved by the Engineer.
- D. Related Sections include the following:
 - 1. Division 3 Section 03732 "Concrete Repair"
 - 2. Division 7 Section 07920 "Joint Sealants"
 - 3. Division 7 Section 07180 "Traffic Coatings"

1.3 REFERENCES

- A. ASTM G109 (Cracked Concrete Beam Test) Standard Test Method for Determining Effects of Chemical Admixtures on Corrosion of Embedded Steel Reinforcement in Concrete Exposed to Chloride Environments.

1.4 SUBMITTALS

- A. Comprehensive Product Data: For each product indicate product standards, physical and chemical characteristics, technical specifications, performance data, product limitations, execution and project specific application procedures provided by the manufacturer's representative, maintenance instructions, and general recommendations regarding each material.
- B. Material Safety Data Sheets (MSDS)
- C. Coverage calculations for the manufacturer's recommended application rates.
- D. Manufacturer's Certificate: Certify that specified products meet or exceed specified product requirements and performance criteria.
- E. Proof of compliance to meet or exceed the properties and performance criteria contained in this specification.

1.5 QUALITY ASSURANCE

- A. Materials Manufacturer: Company specializing in manufacturing the products specified in this Section with minimum ten (10) years documented experience. The manufacturer of the specified product shall be ISO 9001 certified and have in existence a recognized ongoing quality assurance program independently audited on a regular basis.
- B. Applicator: Company specializing in concrete repair, concrete sealer, and migrating corrosion inhibitor applications with minimum five (5) years documented experience approved by manufacturer. Contractor shall maintain personnel who have received training by the manufacturer's representative.
- C. The Engineer may request the services of the supplied products manufacturer's representative to instruct the Project Superintendent, Foreman and all personnel that will be involved with the placement and surface preparation of proper placement procedures at the start of the project and may request random visits during the project to verify that proper placement procedures are being followed.

- D. Install materials in accordance with all safety and weather conditions requirements established by the manufacturer or as modified by applicable rules and regulations of local, state and federal authorities having jurisdiction. Consult Material Safety Data Sheets for complete handling instructions.
- E. Manufacturer must be capable of testing on-site for the presence of the corrosion inhibitor at the specified depth.

1.6 DELIVERY, STORAGE, AND PROTECTION

- A. Transport, handle, store, and protect products in accordance with the manufacturer's recommendations.
- B. All materials must be delivered in original unopened containers with the manufacturer's name, labels, product identification, and batch numbers. Damaged material must be removed from the site immediately.
- C. Comply with instructions for shelf life limitations. Store all materials off the ground and protect from rain, freezing or excessive heat until ready for use. Condition the specified product as recommended by the manufacturer.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Penetrating Corrosion Inhibiting Impregnation Coating shall be water-based, low-odor, non-toxic and VOC compliant, shall not contain calcium nitrate, and shall not form a vapor barrier preventing natural moisture-vapor transmission.
- B. The corrosion inhibitor material shall be a mixed inhibitor, providing protection to the anodic and cathodic parts of the corrosion cell, designed to penetrate the concrete surface and diffuse in vapor or liquid form to the reinforcing steel and form a continuous film protective monomolecular corrosion inhibiting coating on the surface of the steel reinforcing bars.
- C. The penetrating migratory corrosion inhibitor material must penetrate up to 3 inches within a 28-day period and must be capable of reducing active corrosion rates by a minimum of 65%, as indicated by project references and an independent corrosion engineer.
- D. The penetrating migratory corrosion inhibitor material shall have demonstrated the reduction in corrosion currents after treatment as calculated by the Cracked Beam Corrosion Test of concrete (adapted from ASTM G109).

- E. Penetrating Corrosion Inhibiting Impregnation Coating may slightly darken the appearance of the concrete surface but shall not significantly discolor the concrete.

2.2 MANUFACTURERS

- A. Subject to submittals and compliance with requirements, pre-accepted products that may be incorporated into the work include the following:
 - 1. “Sika FerroGard 903 as manufactured by the Sika Corporation.
 - 2. “MasterProtect” 8000CI, as manufactured by Master Builders Solutions/BASF Chemicals Company.
 - 3. Or Alternate as Approved by the Engineer.

PART 3 - EXECUTION

3.1 PREPARATION

- A. The Contractor shall perform all concrete repairs including epoxy crack injection applications prior to application of the Penetrating Corrosion Inhibiting Impregnation Coating.
- B. Surface Preparation shall be in accordance with the manufacturer’s recommendations, which shall include mechanical cleaning of the entire concrete surface to receive the material. Abrasive media blast cleaning surface preparation shall be for vertical surfaces (as recommended by the manufacturer). Surface preparations shall remove all dirt, dust, oil, grease, efflorescence, algae, moss, dirt, etc. on surfaces of areas to receive the Penetrating Corrosion Inhibiting Impregnation Coating.
- C. Surfaces must be clean, sound, and dry. Max moisture content 5%
- D. Surface preparation conditions shall be observed approved by the manufacturer’s representative or the Engineer immediately prior to commencement of material application.

3.2 APPLICATION

- A. Strictly adhere to the manufacturer's recommended temperature ranges for material storage, preparation, application surface temperature, and ambient temperature during application and curing periods.
- B. Apply all materials in strict conformance to manufacturer's recommended application rate, wait time between coats, and other application procedures. Apply two (2) coats minimum.
- C. Materials may be applied by brush, roller, or low-pressure airless spray (if prevailing wind conditions are calm). Apply coats as needed to reach the manufacturer's total consumption rate. Contractor must protect surrounding areas, structures, vehicles, and pedestrians from drips and/or overspray as required to suit the work plans and application methods.
- D. If possible, the manufacturer's representative should be on-site to approve the surface preparation and observe and direct the application of the materials.
- E. Between applying the subsequent coats allow the previous coats to be absorbed into the concrete and dry.
- F. The treated area should be protected from rain or frost for a period of at least 24 hours after Application.

3.3 CURING

- A. Allow all materials to cure between coats and after final application in strict conformance to manufacturer's recommendations prior to subsequent work or opening areas to any pedestrian or vehicular traffic.

3.4 FIELD QUALITY CONTROL

- A. Quality control shall be in accordance with the requirements of "General and Supplementary Conditions" and the manufacturer's recommendations.

END OF SECTION 03933

SECTION 07180

TRAFFIC COATINGS

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS AND RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, apply to this Section.
- B. The Contractor shall coordinate work with that of other trades affecting or affected by the work included under this Section and shall cooperate with such trade, the Testing Agency, the Engineer, and the Owner to ensure steady and timely progress of the work.
- C. The Contractor agrees to accept the results of any tests performed by a qualified independent Testing Agency that may be procured by the Owner.
- D. Where referred to, Standard Specification of Technical Societies, manufacturer's associations and federal agencies shall be the latest edition and include all amendments currently as of the date of the issue of these Specifications.

1.2 SUMMARY

- A. This Section specifies vehicular traffic bearing waterproofing membrane coatings including preparation, materials, application, and warranty.
- B. Related Sections include the following:
 - 1. Division 3 Section 03732 "Concrete Repair"
 - 2. Division 7 Section 07920 "Joint Sealants"

1.3 SUBMITTALS

- A. Product Data: For each product indicated.
- B. Quantity Calculations: Submit product quantity calculations for each coating of material. Liquid materials are to be reported in gallons. Solid materials are to be reported in pounds or cubic feet.
- C. Coverage calculations for the specified application rate and DFT.
- D. Samples for Verification: If requested by the Owner or Engineer during the product submittal process, the Contractor shall provide a small sample (2" x 4" minimum) for each type of traffic coating requested, prepared on a rigid backing, and of same

material as indicated for the Work.

- E. Material Certificates: Manufacturer certification identifying that traffic coatings comply with requirements of the contract documents, based on comprehensive testing of current product formulations within the last three years.
- F. For each product indicated, submit color chart and identification to the Owner for color selection / approval.
- G. Maintenance Data: Identify substrates and types of traffic applied. Include recommendations for periodic inspections, cleaning, care, maintenance, and repair of traffic coatings. Provide snow removal guidelines for traffic-coated areas covered by warranty.
- H. Submit warranty as identified in Part 3, Section 3.7.

1.4 QUALITY ASSURANCE

- A. Installer (Applicator) Qualifications: An experienced applicator who has specialized in installing work similar in material, design, and extent to that indicated for this Project and who is certified/authorized by the product manufacturer.
 - 1. Certification: Written approval or license of applicator by traffic coating manufacturer.
- B. Source Limitations: As follows:
 - 1. Use traffic coatings of a single manufacturer.
 - 2. Obtain primary traffic coating materials, including primers, from traffic coating manufacturer. Obtain secondary materials including aggregates, joint sealants, and substrate repair materials of type and from source recommended by traffic coating manufacturer.
- C. Before installing traffic coatings, notify representatives of authorities having jurisdiction, manufacturer's technical representative, Owner, Engineer, and other concerned entities at least 7 days in advance of installation.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in original packages and containers with seals unbroken and bearing manufacturer's labels showing the following information:
 - 1. Manufacturer's brand name.
 - 2. Type of material.
 - 3. Directions for storage.
 - 4. Date of manufacture and shelf life.

5. Lot or batch number.
 6. Mixing and application instructions.
 7. Color.
- B. Store materials in a clean, dry location protected from exposure to direct sunlight. In storage areas, maintain environmental conditions within range recommended in writing by manufacturer.

1.6 PROJECT CONDITIONS

- A. Perform all Joint Sealants Work and Concrete Repairs Work prior to application of traffic topping coatings.
- B. Do not apply Penetrating Concrete Sealer with Migrating Corrosion Inhibitor (MCI) to substrates to receive traffic topping coatings under Work Item 2.8. Install and fully cure traffic topping coatings under Work Item 2.8 prior to the concrete sealer application. Expansion joint covers, door thresholds, etc. that may cover portions of the concrete slabs to be installed under Work Item 2.35 shall be installed after the traffic topping coatings applied under Work Item 2.8 have fully cured such that the entire concrete slab receives the coating and is not shielded by such components.
- C. Environmental Limitations: Apply traffic coatings within the range of ambient and substrate temperatures recommended in writing by manufacturer. Do not apply traffic coatings to damp or wet substrates, when temperatures are below 50 deg F or above 90 deg F, when relative humidity exceeds 85 percent, or when temperatures are less than 5 deg F above dew point.
1. Do not apply traffic coatings in snow, rain, fog, or mist, or when such weather conditions are imminent during the application and curing period. Apply only when proper conditions occur throughout the depth of the substrate for at least 24 hours before and 72 hours after the application.
 2. Restrict traffic from application area per manufacturer's recommendations, or 48 hours, whichever is greater.
 3. Adequate ventilation and clean water supply required during installation.
 4. Prepared substrate conditions shall meet each product manufacturer's standard requirements and any site-specific recommendations.

PART 2 - PRODUCTS

2.1 MATERIALS - GENERAL

- A. Physical Property Requirements: Provide traffic coatings in accordance with ASTM C 957 “*Standard Specification for High Solids Content, Cold Liquid-Applied Elastomeric Waterproofing Membrane with Integral Wearing Surface*” with engineer approved physical properties as determined by the applicable ASTM standards, and as additionally indicated for individual systems described in the subsequent product specification sections.
- B. Material Compatibility: Provide primers; base, intermediate, and top coats; and miscellaneous materials that are compatible with one another and with substrate under conditions of service and application, as demonstrated by the manufacturer based on testing and field experience.

2.2 TRAFFIC COATINGS MATERIALS:

WORK ITEM 2.7A Floor Repair – Traffic Topping – Full Membrane System (@ Drive Bays)

WORK ITEM 2.7B Floor Repair – Traffic Topping – Wear Coat and UV-Topcoat (@ Drive Bays)

- A. General: The intended use of the materials for the items noted above is as follows:
 - 1. Work Item 2.7A shall be used for the application of traffic topping on areas of existing exposed concrete (no existing coatings) as indicated on the Contract Drawings and as directed by the Engineer.
 - 2. Work Item 2.7B shall be used for the application of a supplementary wear coat (with aggregate) and subsequent UV-topcoat onto areas where existing traffic coatings are present as indicated on the Contract Drawings and as directed by the Engineer.
 - 3. The materials for Work Item 2.7B shall be chemically compatible to the existing traffic coatings for adhesion thereto. The manufacturer of the proposed supplementary coating material shall provide written site-specific recommendations for the preparation and application of their products over the existing coatings materials, including a statement of compatibility to the existing system. The proposed coating manufacturer shall warranty its product’s adhesion to the existing coating only, and not for the adhesion of the existing system to the concrete below.
 - a. The existing traffic coating in the areas to receive Item 2.7B for this

project are shown on the plans.

- B. Available Products: Traffic Coating products shall have a documented proven performance record for the same type of application and traffic exposure conditions in which it shall be used for this project. Traffic coating system for this application shall consist of a 100% solids epoxy primer, a 100% solids polyurethane or modified polymer waterproofing base coat membrane, a heavy-duty 100% solids epoxy or urethane top / wear coat(s) with manufacturer-approved silica sand broadcast aggregate (sized, washed, dried, and bagged) applied at the recommended coverage, and a 98% solids UV-Stable aliphatic polyurethane or UV-Stable epoxy finish coat.

The minimum physical properties for this traffic coating system shall conform to the following cured values unless approved otherwise by the engineer:

Primer:	As designed by the coating system manufacturer to support the full-system requirements.
Base Coat (membrane):	Tensile Strength – (ASTM D 412) 1000 psi Elongation - (ASTM D 412) 300% Hardness – (ASTM D 2240) 65/Shore A
Top Coat (wear course):	Tensile Strength – (ASTM D 412) 2000 psi Elongation - (ASTM D 412) 75% Hardness – (ASTM D 2240) 80/Shore A
Finish Coat (Exterior UV-Stable):	Tensile Strength – (ASTM D 412) 2000 psi Elongation - (ASTM D 412) 75% Hardness – (ASTM D 2240) 80/Shore A

Subject to compliance with requirements, pre-accepted products that may be incorporated into the work include the following:

1. “AUTO-GARD FC” Urethane Traffic Deck Waterproofing System with Exterior (UV- Stable) Topcoat as manufactured by NEOGARD (A part of HEMPEL), 2728 Empire Central, Dallas, TX 75235; 800-321-6588.
2. MasterSeal Traffic 2530 High-solids Epoxy/Polyurethane Waterproofing Traffic Bearing Membrane System as manufactured by Master Builders Solutions Construction Systems US, LLC/MBCC Group, 889 Valley Park Drive , Shakopee, MN 55379; 800-433-9517. MasterSeal system shall match

the previously approved system utilized for this work at the Manchester•Boston Regional Airport Parking Garage for the Level-4 coatings.

3. “MARK 170.2 FLEXODECK II” Multi-polymer Traffic Deck Waterproofing System with Exterior (UV Stable) Topcoat” as manufactured by the Poly-Carb Division of Olin Corporation, Twinsburg, OH ; 216-536-7777
 4. Or equal as approved by Engineer
- C. Primer: Manufacturer's standard factory-formulated 100% solids primer recommended for substrate and conditions indicated.
- D. System Component Coat Thicknesses: As recommended by manufacturer for the substrate and heavy-duty service conditions as indicated and approved by the Engineer, but not less than 65 mils dry film thickness (DFT) for the total system measured excluding aggregate:
- | | | |
|-----------------------------------|----------|-----------------------------------|
| 1. Primer: | 5 | mils dry film thickness |
| 2. System Base Coat | 20 to 25 | mils dry film thickness |
| 3. Top/Wear Coat(s) total build*: | 20 to 30 | mils dry film thickness (minimum) |
| 4. Finish Coat: | 15 | mils dry film thickness (minimum) |
- *May require two coats at 10 to 15 mils each based on mfr recommendations
- E. Aggregate: Uniformly graded washed silica sand, silicon carbide, or proprietary coating system aggregate of particle sizes, shape, and minimum hardness as recommended in writing by traffic coating manufacturer and approved by the Engineer.
1. Spreading Rate: In accordance with manufacturer recommendations, but no less than 30 pounds per 100 sf. (total build).
- F. Color of exposed traffic coating: Light Gray (similar to the existing coatings) as selected by Owner from color chart and/or system sample boards to be submitted by the Contractor prior to material procurement.

2.3 TRAFFIC COATINGS MATERIALS :

WORK ITEM 2.7H-T Floor Repair – Traffic Topping Wearcoat & UV-Topcoat - Helix

WORK ITEM 2.7H-R Floor Repair – Traffic Topping Membrane Repairs – Helix

- A. General: The intended use of the materials for the items noted above is as follows:

1. Work Item 2.7H-T shall be used for the application of a wear coat with broadcast aggregate and UV-Topcoat traffic topping onto areas in the Entrance or Exit Helix where existing traffic coating materials are present, as indicated on the Contract Drawings and as directed by the Engineer.
 2. Item 2.7H-R shall be used for the application of a full coating system on areas of exposed concrete where the existing coating has failed and has been removed as part of the work in the Entrance or Exit Helix, as indicated on the Contract Drawings and as directed by the Engineer.
- B. Available Products: Traffic Coating products shall match the existing system in all areas to receive traffic toppings under these Work Items. Materials shall be of the same manufacturer and specific products/components as the existing system unless specifically recommended otherwise in writing for this work by the coating manufacturer.
1. The existing traffic coating in the areas to receive Item 2.H-T and 2.7H-R for this project was installed circa 2006 and consists of the following material:

Kelmar T.E. (Exposure 3) System as manufactured by Technical Barrier Systems, Inc. (TBS) as available from MJ Farraher Associates, 472 Main Street, Hingham, MA 02043; 888-537-2888 , (mf@kelmar.com)

Components:

 - 1) Monobond Primer (250 SF/gal)
 - 2) NEO V Rubber Waterproofing Membrane (40 SF/gal)
 - 3) Wear Coat I: Kelmar TE Epoxy FC (Fast Cure, 72 SF/gal) & Aggregate broadcast
 - 4) Wear Coat II: Kelmar TE Epoxy FC (Fast Cure, 72 SF/gal) & Aggregate broadcast
 - 5) # 1910 UV Topcoat (150 SF/gal)
 - 6) Aggregate for wearcoats shall be black blasting abrasive sourced from the copper slag process; Black Beauty (brand) as manufactured by Harsco Corporation or coating manufacturer approved equal. Broadcast to full coverage refusal / remove excess after cure.

Note: Black Beauty or equivalent approved aggregate shall be sourced from copper slag processing as specifically recommended by the coating manufacturer. Contractor shall allow for extended lead time and submit verification documentation of copper slag process aggregate sourcing.

- C. Color of exposed traffic coating: Black.
- D. All excess (leftover) on-site materials for both Work Item 2.7H-T and 2.7H-R shall be salvaged to the Owner in the original containers (unopened or re-sealed as necessary) for storage and potential future use.

2.4 TRAFFIC COATINGS MATERIALS:

WORK ITEM 2.7J Floor Repair – Nylon Reinforced Traffic Topping (1ft Wide) at Jointline – Precast Tee-To-Tee Flange

- A. Available Products: Traffic Coating products shall have a documented proven performance record for the same type of application and traffic exposure conditions in which it shall be used for this project. Traffic coating system for this application shall consist of a 100% solids epoxy primer, a 100% solids polyurethane or modified polymer waterproofing base coat membrane, a heavy-duty 100% solids epoxy or urethane top / wear coat(s) with manufacturer-approved silica sand broadcast aggregate (sized, washed, dried, and bagged) applied at the recommended coverage, and a 98% solids UV-Stable aliphatic polyurethane or UV-Stable epoxy finish coat.

The minimum physical properties for this traffic coating system shall conform to the following cured values unless approved otherwise by the engineer:

Primer:	As designed by the coating system manufacturer to support the full-system requirements.
Base Coat (membrane):	Tensile Strength – (ASTM D 412) 1000 psi Elongation - (ASTM D 412) 300% Hardness – (ASTM D 2240) 65/Shore A
Top/Wear Coat(s):	Tensile Strength – (ASTM D 412) 2000 psi Elongation - (ASTM D 412) 75% Hardness – (ASTM D 2240) 80/Shore A
Finish Coat (Exterior UV-Stable):	Tensile Strength – (ASTM D 412) 2000 psi Elongation - (ASTM D 412) 75% Hardness – (ASTM D 2240) 80/Shore A

Subject to compliance with requirements, pre-accepted products that may be incorporated into the work include the following:

1. “AUTO-GARD FC” – Manchester • Boston Regional Airport FY10/11 Approved Site Specific System as manufactured by NEOGARD Division of the Jones-Blair Industrial Coatings Company (Hempel Group USA Inc.) , 2728 Empire Central, Dallas, TX 75235; 800-321-6588. NEOGARD System shall match the previously approved system utilized for this work at the Manchester•Boston Regional Airport Parking Garage for the Level-2 coatings (2010), Level-3 coatings (2013), and Level-6 coatings (2015).
2. MasterSeal Traffic 2530 High-solids Epoxy/Polyurethane Waterproofing Traffic Bearing Membrane System as manufactured by Master Builders Solutions/BASF Construction Chemicals, 889 Valley Park Drive , Shakopee, MN 55379; 800-433-9517. MasterSeal system shall match the previously approved system utilized for this work at the Manchester•Boston Regional Airport Parking Garage for the Level-4 coatings (2017).
3. “MARK 170.2 FLEXODECK II – HF” (High Flexibility) Top Coat / Exterior (UV Stability) System” as manufactured by the Poly-Carb Division of Olin Corporation, Twinsburg, OH ; 216-536-7777
4. “Kelmar PC” Flexible Modified Polymer Traffic Deck Waterproofing System, as modified to integrate with Kelmar FWC (Exposure 3) System (as noted in Work Items 2.7A and 2.7B) as manufactured by R&D Technical Solutions Ltd., 7000 Davand Dr., Mississauga, ON, Canada, L5T 1J5 ; 800-387-5703.
5. Or equal as approved by Engineer

B. System Component Coat Thicknesses: As recommended by manufacturer for substrate and service conditions indicated and approved by the Engineer, but not less than 110 mils dry film thickness (DFT) for the total system measured at the detail base coat excluding aggregate and membrane reinforcement fabric. The component thicknesses shall be as indicated below or as otherwise approved by the Engineer.

- | | |
|--|--------------------------------------|
| 1. Primer: | 5 mils dry film thickness (minimum) |
| 2. Detail Base Coat (8” wide over joint) | 35 mils dry film thickness (minimum) |
| 3. Nylon Fabric Reinforcement Strip
(6” wide, continuous, placed over joint & embedded into Detail Base Coat) | N/A |
| 4. System Base Coat (12” wide over joint) | 30 mils dry film thickness (minimum) |

5. Top/Wear Coat(s) total build*: 28 to 30 mils dry film thickness (minimum)
6. Finish Coat: 12 to 15 mils dry film thickness (minimum)

*May require two coats at 15 mils each based on mfr recommendations

- C. Aggregate: Uniformly graded washed silica sand, silicon carbide, or proprietary coating system aggregate of particle sizes, shape, and minimum hardness as recommended in writing by traffic coating manufacturer and approved by the Engineer.
 1. Spreading Rate: In accordance with manufacturer recommendations, but no less than 20 pounds per 100 sf. (total build).
- D. Nylon Reinforcement Strip: 6" wide rolled material as specified and/or supplied by the coating system manufacturer for this installation and approved by the Engineer. Each joint line reinforcement segment shall be continuous for at least 50 feet without splices. Nylon reinforcement strips shall be overlapped a minimum of 3" where continuity is interrupted. Total system including reinforcement strip shall extend 3" at least onto existing coatings, and/or be turned upward 2" onto vertical surfaces at terminations.
- E. Color of exposed traffic coating: Light Gray (to closely match the existing) as selected by Owner from color chart and/or system sample boards to be submitted by the Contractor prior to material procurement.

2.5 TRAFFIC COATINGS MATERIALS:

WORK ITEM 2.9 Floor Repair – Traffic Topping - Pedestrian Grade

- A. Available Products: Traffic Coating products shall have a documented proven performance record for the same type of application and traffic exposure conditions in which it shall be used for this project. Traffic coating system for this application shall consist of a UV-stable 100% solids polyurethane primer, a 100% solids polyurethane waterproofing membrane, a 98% solids UV-Stable aliphatic polyurethane Top/Wear Coat with manufacturer-approved broadcast aggregate and backroll at the recommended coverage.

The minimum physical properties for this traffic coating system shall conform to the following values unless approved otherwise by the engineer:

Primer: Tensile Strength – (ASTM D 412) 4000 psi, Elongation - (ASTM D 412)

50%, Hardness – (ASTM D 2240) 75/Shore D

Base Coat: Tensile Strength – (ASTM D 412) 3000 psi, Elongation - (ASTM D 412) 800%, Hardness – (ASTM D 2240) 65/Shore A

Top/Wear Coat: Tensile Strength – (ASTM D 412) 3600 psi, Elongation - (ASTM D 412) 240%, Hardness – (ASTM D 2240) 90/Shore A

Subject to compliance with requirements, pre-accepted products that may be incorporated into the work include the following:

1. “AUTO-GARD FC” Urethane Traffic Deck Waterproofing System with Exterior (UV- Stable) Topcoat as manufactured by the NEOGARD Division of Jones-Blair Company, 2728 Empire Central, Dallas, TX 75235; 800-321-6588
 2. MasterSeal Traffic 2530 High-solids Epoxy/Polyurethane Waterproofing Traffic Bearing Membrane System as manufactured by Master Builders Solutions/BASF Construction Chemicals, 889 Valley Park Drive , Shakopee, MN 55379; 800-433-9517.
 3. “MARK 170.2 FLEXODECK II” Urethane and Multi-polymer Traffic Deck Waterproofing System with Exterior (UV Stable) Topcoat” as manufactured by the Poly-Carb Division of Olin Corporation, Twinsburg, OH ; 216-536-7777
 4. Or equal as approved by Engineer
- B. Primer: Manufacturer's standard factory-formulated primer recommended for substrate and conditions indicated.
- C. Component Coat Thicknesses: As recommended by manufacturer for substrate and service conditions indicated, but not less than 30 mils dry film thickness for the total system measured excluding aggregate.
1. Primer: 5 mils dry film thickness (minimum)
 2. Base coat: 20 mils dry film thickness (minimum)
 3. Top / Wear Coat (one coat): 15 to 20 mils dry film thickness (minimum)
 4. Finish Coat: 12 to 15 mils dry film thickness (minimum)
- D. Aggregate: Uniformly graded washed silica sand or silicon carbide of particle sizes, shape, and minimum hardness as recommended in writing by traffic coating manufacturer. Broadcast and backroll aggregate into Top / Wear Coat as recommended by the manufacturer.

1. Spreading Rate: As recommended by manufacturer for substrate and service conditions indicated, but not less than 15 lb/100 sq. ft. for silica sand or 8 lb/100 sq. ft. for silicon carbide.

E. Color of exposed traffic coating: Light Gray

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Manufacturer's representative shall examine substrates, with Applicator present, for compliance with requirements and for other conditions affecting performance of traffic coatings.
 1. Verify compatibility with and suitability of substrates.
 2. Begin coating application only after minimum concrete patch curing and drying period recommended by traffic coating manufacturer has passed, after unsatisfactory conditions have been corrected, and after surfaces are dry.
 3. Verify that substrates are visibly dry and free of moisture. Test for moisture by four-hour rubber mat test method and/or portable moisture meter just prior to each coating application period. Do not apply coatings until moisture levels are within the coating manufacturer's recommendations for application.
 4. Application of coating indicates Contractor's acceptance of surfaces and conditions for warranty purposes.

3.2 PREPARATION

- A. For Traffic Topping: Clean and prepare substrates scheduled for traffic coating application by the following means:
 1. Steel-shot blasting of all areas to receive new traffic topping under Work Item 2.7J to produce a clean, dust-free, laitance-free, dry substrate for traffic coating application. Removal of localized existing traffic marking paint shall be achieved to a minimum of 90 to 95% or better based on the judgement of the Engineer.
 2. Steel-shot blasting of all areas to receive new traffic topping under Work Item 2.7A to produce a clean, dust-free, laitance-free, dry substrate for traffic coating application unless noted otherwise in this specification for certain work areas. Removal of localized existing traffic marking paint shall be achieved to a minimum of 90 to 95% or better based on the judgement of the Engineer.

3. Prepare surfaces of existing traffic toppings in the general parking level areas to receive top/wear coats application under Item 2.7B by pressure washing with detergent, followed by high-pressure clean water rinse(s) working downhill as required to displace all dirt/debris/and residual detergent off of the prepared surfaces. The detergent and rinse pressure washing shall be performed at equipment pressure, tip configuration, and hold- distance as recommended by the coating manufacturer. Pressure washing shall be followed by either a solvent wipe with coating manufacturer's recommended solvent just prior to coating topcoat application, or other means if recommended by the approved coating manufacturer.
4. Prior to surface preparations for Helix traffic topping coatings, pre-clean all areas of the existing traffic toppings in the drive bays that are to receive traffic topping application (under Work Item 2.7H-R) by pressure washing with the coating manufacturer's approved detergent (commercial grade neutral-Ph type) followed by high-pressure clean water rinse(s) working downhill as required to displace all dirt/debris/road salt and residual detergent off of the work surfaces. The detergent and rinse pressure washing shall be performed at equipment pressure, tip configuration, and hold-distance as required to avoid damage to the existing coatings and as recommended by the coating manufacturer.

Prepare surfaces of the concrete and existing traffic topping in the repair areas, to receive traffic topping application under Item 2.7H-R, by either steel-shot blasting or abrasive blasting with black blasting abrasive sourced from the copper slag process (Black Beauty or equal), to remove laitance and fully abrade areas of smooth existing coating surface to an evenly textured finish accordance with the coating manufacturer's recommendations, without damaging or removing the existing epoxy coating or embedded aggregate in in adjacent areas. Contractor shall be responsible for maintaining consistent and appropriate blast intensity and shall repair localized areas where blasting operations damage the existing coating (wear course and/or underlying membrane) outside the designated repair limits at no additional cost to the Owner. Broom sweep and air blast the prepared surface.

5. For localized areas of traffic topping where steel-shot blasting equipment cannot access for new traffic topping applications, the exposed concrete may be alternatively prepared by means of either abrasive blasting with black blasting abrasive sourced from the copper slag process (black beauty or equal) or abrading the full surface with diamond-cup grinding wheels to produce a clean, dust-free, laitance-free, dry substrate for traffic coating application.
6. Remove grease, oil, paints, and other penetrating contaminants from concrete.

7. Remove concrete fins, ridges, sharp edges, and other projections.
 8. Remove laitance, glaze, efflorescence, curing compounds, concrete hardeners, form- release agents, and other incompatible materials that might affect coating adhesion.
 9. Remove remaining loose material to provide a sound surface, and clean surfaces according to ASTM D 4258.
 10. Perform concrete repairs and pre-fill holes and cracks in accordance with the coating system manufacturer's recommendations.
 11. Provide perimeter termination sawcut in accordance with drawing details or as directed.
 12. The Contractor shall coordinate his work and arrange for the manufacturer's representative or the Engineer to review prepared surfaces for any unacceptable conditions prior to traffic coating application. The General Contractor and/or Traffic Coating Installer shall correct any surface irregularities or deficiencies noted.
- B. For All Coating Applications: Mask adjoining surfaces not receiving traffic coatings, deck drains, and other deck substrate penetrations to prevent spillage, leaking, and migration of coatings.
- C. Adhere to Manufacturer's instructions.

3.3 TERMINATIONS AND PENETRATIONS

- A. Provide sawcut edge terminations in accordance with the Contract Drawings subsidiary to the corresponding Traffic Coating Items.
- B. Prepare vertical and horizontal surfaces at terminations and penetrations through traffic coatings and at expansion joints, drains, and sleeves according to ASTM C 1127 and manufacturer's written recommendations subsidiary to the corresponding Traffic Coating Items.
- C. Provide sealant cants at penetrations and at reinforced and non-reinforced deck-to-wall butt joints.
- D. Terminate edges of deck-to-deck expansion joints with preparatory base-coat strip subsidiary to corresponding Traffic Coating Items.

3.4 JOINT AND CRACK TREATMENT

- A. Prepare, rout, and seal floor slab cracks and replace failed joint sealant in substrates as required by the contract drawings and specifications, according to the Contract Drawings, ASTM C 1127, and the traffic coating manufacturer's written recommendations.
1. Before filling jointlines and coating surfaces, remove dust and dirt from joints and cracks according to ASTM D 4258 and/or clean surface of existing joint sealants with air blast followed by complete solvent wipe with xylene or approved alternate just prior to coating application.
 2. Fill surface irregularities, recesses, depressions, along Tee-to-Tee jointlines with 100% solids flexible epoxy filler paste (or other filler furnished by the coating system manufacturer), or base coat material if recommended by the coating system manufacturer and approved by the Engineer, to provide a smooth level transition across the T/T floor elements jointline.
 3. Apply 8" wide detail strip of base (membrane) coat, of DFT thickness recommended by the manufacturer, over precast Tee-to-Tee joints.
 4. A nylon fabric reinforcement strip shall be wet-embedded into the base coat (membrane) detail strip and back-rolled in accordance with the coating system manufacturer instructions for this application to provide joint-bridging strength for a 5-year joint warranty.

3.5 TRAFFIC COATING APPLICATION

- A. Apply traffic coating material according to ASTM C 1127 and manufacturer's written recommendations.
1. Start traffic coating applications in presence of the Engineer or manufacturer's technical representative.
 2. Verify that wet film thickness of each component coat complies with manufacturer's requirements every 2000 sq. ft. The contractor shall provide film thickness gages for use by the Engineer during coating operations.
 3. Apply traffic coatings to prepared wall terminations and vertical surfaces to height indicated and omit aggregate on vertical surfaces.

3.6 CURING AND PROTECTING

- A. Cure traffic coatings according to manufacturer's written recommendations. Prevent contamination and damage during application and curing stages.
- B. Protect traffic coatings from damage and wear during remainder of construction period.
- C. Defects due to blistering, bubbling, contamination by dirt, debris or traffic shall be removed, surface cleaned, and defects repaired. Following repairs, entire traffic coated area affected shall be treated with an additional topcoat to provide a smooth finish with uniform appearance. Removal and replacement of striping shall be included in this repair work (if needed) resulting from traffic coating defects. Limits of repair to topcoat shall be reviewed with and established by the Engineer. All repair and associated work shall be completed at no cost to the Owner.

3.7 GUARANTEE/WARRANTY

- A. General Warranty: Special warranty specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
- B. Special Warranty: The traffic coating manufacturer shall furnish the Owner with a written JOINT PERFORMANCE WARRANTY, by Manufacturer and Applicator, agreeing to repair or replace traffic coatings that do not comply with requirements or that deteriorate during the specified warranty period.
 - 1. Deterioration of traffic coatings includes, but is not limited to, the following:
 - a. Adhesive or cohesive failures.
 - b. Abrasion or tearing failures.
 - c. Surface cracking, crazing, or spalling.
 - d. Aggregate pullout.
 - e. Intrusion of water, oils, gasoline, grease, salt, deicer chemicals, or acids into deck substrate.
 - f. All other conditions deemed to be workmanship or material related deficiencies.
 - 2. Full Warranty Period for new coating application: **Five years** from date of Substantial Completion.
 - 3. Full Warranty Period for wearcoat/topcoat application only (exclusive of existing coating adhesion to concrete below): **Five Years** from date of Substantial Completion.

END OF SECTION 07180

SECTION 07190

PENETRATING CONCRETE SEALER WITH MIGRATING CORROSION INHIBITOR (MCI)

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS AND RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, apply to this Section.
- B. The Contractor shall coordinate work with that of other trades affecting or affected by the work included under this Section and shall cooperate with such trades, the Testing Agency, the Engineer, and the Owner to assure steady and timely progress of the work.
- C. The Contractor agrees to accept the results of any tests secured by a qualified Testing Agency.
- D. Where referred to, Standard Specification of Technical Societies, manufacture's associations and federal agencies shall be the latest edition and include all amendments currently as of the date of the issue of these Specifications.

1.2 SUMMARY

- A. Penetrating Concrete Sealer with Migrating Corrosion Inhibitor (MCI) shall be as indicated on the plans, repair details, and in Section 02000 "Work Item Scopes" as Work Item 2.8.
- B. The limits of the surfaces to be sealed shall be limited to the existing concrete floor which does not have an existing or proposed traffic bearing waterproofing membrane coating system, and precast concrete wall panel elements as identified on the drawings and reviewed in the field with and approved by the Engineer prior to the commencement of the work. Payment will only be made for pre-established areas as approved by the Engineer.
- C. Related Sections include the following:
 - 1. Division 3 Section 03732 "Concrete Repair"
 - 2. Division 7 Section 07920 "Joint Sealants"
 - 3. Division 7 Section 07180 "Traffic Coatings"

1.3 REFERENCES

- A. ASTM C666 Resistance of Concrete to Rapid Freezing and Thawing
- B. ASTM C672 Scaling Resistance of Concrete Surfaces Exposed to De-icing Chemicals
- C. ASTM D5090 Standardizing Ultrafiltration Permeate Flow Performance Data
- D. ASTM E96 Water Vapor Transmission of Materials
- E. ASTM G109 Cracked Concrete Beam Test

1.4 SUBMITTALS

- A. Comprehensive Product Data: For each product indicate product standards, physical and chemical characteristics, technical specifications, performance data, product limitations, execution and project specific application procedures provided by the manufacturer's representative, maintenance instructions, and general recommendations regarding each material.
- B. Material Safety Data Sheets (MSDS)
- C. Coverage calculations for the recommended application rates.
- D. Manufacturer's Certificate: Certify that specified products meet or exceed specified product requirements and performance criteria.
- E. Proof of compliance to meet or exceed the properties and performance criteria contained in this specification.

1.5 QUALITY ASSURANCE

- A. Materials Manufacturer: Company specializing in manufacturing the products specified in this Section with minimum ten (10) years documented experience.
- B. Applicator: Company specializing in concrete repair, concrete sealer, and migrating corrosion inhibitor applications with minimum five (5) years documented experience approved by manufacturer. Contractor shall maintain personnel who have received training by the manufacturer's representative.
- C. The Engineer may request the services of the supplied products manufacturer's representative to instruct the Project Superintendent, Foreman and all personnel

that will be involved with the placement and surface preparation of proper placement procedures at the start of the project and may request random visits during the project to verify that proper placement procedures are being followed.

- D. Install materials in accordance with all safety and weather conditions requirements established by the manufacturer or as modified by applicable rules and regulations of local, state and federal authorities having jurisdiction. Consult Material Safety Data Sheets for complete handling instructions.
- E. Manufacturer must be capable of testing on-site for the presence of the corrosion inhibitor at the specified depth.

1.6 DELIVERY, STORAGE, AND PROTECTION

- A. Transport, handle, store, and protect products in accordance with the manufacturer's recommendations.
- B. All materials must be delivered in original unopened containers with the manufacturer's name, labels, product identification, and batch numbers. Damaged material must be removed from the site immediately.
- C. Comply with instructions for shelf life limitations. Store all materials off the ground and protect from rain, freezing or excessive heat until ready for use. Condition the specified product as recommended by the manufacturer.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Penetrating Concrete Sealer With Migrating Corrosion Inhibitor (MCI) shall be a silane (or silane/siloxane blend) penetrating concrete sealer containing Migrating Corrosion Inhibitor compounds, OR a specifically manufacturer-coordinated 2-product system (sourced from a single manufacturer) consisting of an application of a Penetrating Corrosion Inhibiting Impregnation Coating for hardened concrete and a directly subsequent application of a silane (or silane/siloxane blend) penetrating concrete sealer.
- B. The materials shall be water-based or solvent based, and shall be low-odor, non-toxic and VOC compliant, shall not contain calcium nitrate, and shall not form a vapor barrier preventing natural moisture-vapor transmission.

- C. The concrete sealer material shall consist of a minimum 40% silane (or silane/siloxane blend) solids and active ingredients by weight. Alternatively, multiple applications of a lower % solids concrete sealer may be approved to obtain the similar water repellant effects of a minimum 40% solids application yielding at least 85% reduction in Water Absorption (NCHRP Report 244) given adequate documentation and quality assurance by the material manufacturer with on-site quality assurance testing.
- D. The corrosion inhibitor material shall be a mixed inhibitor, providing protection to the anodic and cathodic parts of the corrosion cell, designed to penetrate the concrete surface and diffuse in vapor or liquid form to the reinforcing steel and form a continuous film protective monomolecular corrosion inhibiting coating on the surface of the steel reinforcing bars.
- E. The penetrating migratory corrosion inhibitor material must penetrate up to 3 inches within a 28-day period, and must be capable of reducing active corrosion rates by a minimum of 65%, as indicated by project references and an independent corrosion engineer.
- F. The penetrating migratory corrosion inhibitor material shall have demonstrated the reduction in corrosion currents after treatment as calculated by the Cracked Beam Corrosion Test of concrete (adapted from ASTM G109).
- G. Penetrating Concrete Sealer with Migrating Corrosion Inhibitor (MCI) may slightly darken the appearance of the concrete surface but shall not significantly discolor the concrete.

2.2 MANUFACTURERS

- A. Subject to submittals and compliance with requirements, pre-accepted products that may be incorporated into the work include the following:
 - 1. “MCI –2019 Sealer” as manufactured by the Cortec Corporation.
 - 2. “Protectosil 300” as manufactured by Evonik Industries Inc.
 - 3. “Sika FerroGard 903 in conjunction with Sikagard 701W” as manufactured by the Sika Corporation.
 - 4. Or Alternate as Approved by the Engineer.

PART 3 - EXECUTION

3.1 PREPARATION

- A. The Contractor shall perform all concrete repairs, joint sealant replacements, and traffic topping coating applications prior to application of the Penetrating Concrete Sealer With Migrating Corrosion Inhibitor.
- B. Surface Preparation shall be in accordance with the manufacturer's recommendations, which shall include mechanical cleaning of the entire concrete surface by means of shot-blasting all floor surfaces. Water blasting and/or sand-blasting surface preparation shall be for vertical surfaces (as recommended by the manufacturer). Surface preparations shall remove all dirt, dust, oil, grease, efflorescence, and pavement markings on surfaces of areas to receive Penetrating Concrete Sealer With Migrating Corrosion Inhibitor. Removal of localized existing traffic marking paint shall be achieved to a minimum of 90 to 95% or better based on the judgement of the Engineer.
- C. Surfaces must be clean, sound, and dry. Max moisture content 5%
- D. Surface preparation conditions shall be observed approved by the manufacturer's representative or the Engineer immediately prior to commencement of material application.

3.2 APPLICATION

- A. Environmental Conditions: Do not apply any material if it is raining or if such conditions appear to be imminent within 24 hours. Strictly adhere to the manufacturer's recommended temperature ranges for material storage, preparation, application surface temperature, and ambient temperature during application and curing periods.
- B. Apply all materials in strict conformance to manufacturer's recommended application rate, wait time between coats, and other application procedures.
- C. Materials may be applied by brush, roller, or low-pressure airless spray (if prevailing wind conditions are calm). Apply coats as needed to reach the manufacturer's total consumption rate. Contractor must protect surrounding areas, structures, vehicles, and pedestrians from drips and/or overspray as required to suit the work plans and application methods.
- D. If possible, the manufacturer's representative should be on-site to approve the surface preparation and observe and direct the application of the materials.

3.3 CURING

- A. Allow all materials to cure between coats and after final application in strict conformance to manufacturer's recommendations prior to subsequent work or opening areas to any pedestrian or vehicular traffic.
- B. Treated areas shall be protected from rain for a period of 24 hours after application. Corrective actions required due to exposure to rain conditions within curing periods will be the Contractor's responsibility.

3.4 FIELD QUALITY CONTROL

- A. Quality control shall be in accordance with the requirements of "General and Supplementary Conditions" and the manufacturer's recommendations.

END OF SECTION 07190

SECTION 07920

JOINT SEALANTS

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS AND RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, apply to this Section.
- B. The Contractor shall coordinate work with that of other trades affecting or affected by the work included under this Section and shall cooperate with such trade, the Testing Agency, the Engineer, and the Owner to ensure steady and timely progress of the work.
- C. The Contractor agrees to accept the results of any tests secured by a qualified Testing Agency.
- D. Where referred to, Standard Specification of Technical Societies, manufacturer's associations and federal agencies shall be the latest edition and include all amendments currently as of the date of the issue of these Specifications.

1.2 SUMMARY

- A. This Section specifies the removal and replacement of failed sealants at Tee-to-Tee floor element joints, precast concrete wall panel joints, connections, control joints, construction joints, and floor cracks.
- B. Related Sections include the following:
 - 1. Division 3 Section 03732 "Concrete Repair"
 - 2. Division 7 Section 07180 "Traffic Coatings"

1.3 PERFORMANCE REQUIREMENTS

- A. Provide elastomeric joint sealants that establish and maintain watertight and airtight continuous joint seals without staining or deteriorating joint substrates.

1.4 REFERENCES

- A. ASTM C 920 Specification for Elastomeric Joint Sealants.
- B. ASTM C 1193 Guide for Use of Joint Sealants
- C. ASTM D 1056 Specification for Flexible Cellular Materials - Sponge or Expanded Rubber.
- D. ASTM D 1667 Specification for Flexible Cellular Materials--Vinyl Chloride Polymers and Copolymers (Closed-Cell Foam).

1.5 SUBMITTALS

- A. Product Data: For each joint-sealant product indicated. Provide data indicating sealant chemical characteristics, performance criteria, substrate preparation, limitations, and color availability.
- B. Provide a manufacturer's letter of compatibility indicating sealant manufacturer has reviewed and verified compatibility with proposed traffic coatings and pavement marking materials. Letter shall identify each traffic coating and pavement marking, manufacturer's name and product.
- C. Qualification Data: For Installer, submit experience record identifying similar work on projects performed within the past five years. Include project name, location, Engineering/Architectural Firm, contact name and telephone number.
- D. Submit warranty as identified in Part 3, Section 3.6.

1.6 QUALITY ASSURANCE

- A. Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.

1.7 PROJECT CONDITIONS

- A. Do not proceed with installation of joint sealants under the following conditions:
 - 1. When ambient and substrate temperature conditions are outside limits permitted by joint- sealant manufacturer or are below 40° F.
 - 2. When joint substrates are wet.
 - 3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
 - 4. Contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

PART 2 - PRODUCTS

1.8 MANUFACTURERS

- A. Products: Subject to compliance with requirements, provide one of the products listed in other Part 2 articles.
 - 1. Sika Corporation
 - 2. Sonneborn
 - 3. Tremco

1.9 MATERIALS, GENERAL

- A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer, based on testing and field experience.
- B. Colors of Exposed Floor Slab Joint Sealants: Match existing joint sealants.

1.10 ELASTOMERIC JOINT SEALANTS

- A. Elastomeric Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied chemically curing sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.
- B. Multi-component self-leveling Urethane Sealant:
 - 1. Horizontal Floor Slab Joints.
 - a. Sika Corporation, Inc.; Sikaflex – 2c SL.
 - b. Sonneborn, Sonolastic SL 2.
 - c. Tremco; THC-901.
 - d. Or equal as approved by Engineer.
- C. Multi-component non-sag Urethane Sealant:
 - 1. Horizontal Floor Slab Joints.
 - a. Sika Corporation, Inc.; Sikaflex – 2c NS.
 - b. Sonneborn, Sonolastic 150.
 - c. Tremco; Dymeric 240FC
 - d. Or equal as approved by Engineer.

1.11 JOINT-SEALANT BACKING

- A. General: Provide closed cell polyethylene backer rods that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing. Backer rods shall be no less than 1/8 inch greater in diameter than width of joint to allow for compression.

1.12 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.

PART 3 - EXECUTION

2.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance. Notify Engineer in writing of non-conforming conditions, no less than 7 days prior to scheduled joint sealant installation.
- B. Proceed with installation only after unsatisfactory conditions have been corrected. Installation of joint sealant indicates acceptance of substrates and conditions.

2.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:
 - 1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.

2. Clean porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:
 - a. Concrete
 3. Clean nonporous and metal surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.
- B. Control Sealant Depth and Cross-Sectional Shapes by Proper Placement of Backer Rod. Install backer rod by compressing and rolling into place without stretching lengthwise.
1. Do not leave gaps between ends of backer rod.
 2. Do not stretch, twist, puncture or tear backer rod.
- C. Where joint width does not permit the use of a backer rod, a bond breaker must be provided to prevent 3-point bonding.
- D. Joint Priming: Prime joint substrates, where recommended by joint-sealant manufacturer product data. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

2.3 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.
- B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Install sealants using proven techniques that comply with the following and at the same time backings are installed.
 1. Completely fill recesses in each joint configuration.
 2. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability per manufacturers written recommendations to be submitted to engineer prior to commencement of sealant installations.

- D. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
 - 1. Remove excess sealant from surfaces adjacent to joints.
 - 2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
 - 3. Provide concave joint configuration per Figure 5A in ASTM C 1193, unless otherwise indicated.
- E. Prior to mixing any sealants for the project, the contractor shall contact the manufacturer and arrange for the sealant manufacturer's authorized representative to inspect and approve all equipment, approve all mixing procedures, and shall furnish a letter to the Engineer verifying such approval. The sealant manufacturer's representative shall be on-site for the first day of sealant installations to observe and verify installation procedures, and during the course of caulking and sealant operations, the sealant manufacturer shall conduct periodic inspections to ensure that all equipment is functioning properly and approved procedures are being adhered to.

2.4 CLEANING

- A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

2.5 PROTECTION

- A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

2.6 GUARANTEE/WARRANTY

- A. Installer's Warranty: Installer's standard form in which Installer agrees to repair or replace elastomeric joint sealants that do not comply with workmanship, performance and other requirements specified in this Section within one (1) year of substantial completion.
- B. Manufacture Warranty: The Manufacturer shall warrant product and material to be free from defects and meet the specified properties when applied for a period of not less than one year.

- C. Special warranties specified in this Article exclude deterioration or failure of elastomeric joint sealants from the following:
1. Movement of the structure resulting in stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression caused by structural settlement or errors attributable to design or construction.
 2. Mechanical damage caused by individuals, tools, or other outside agents.
 3. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

END OF SECTION 07920