Manchester - Boston Regional Airport City of Manchester, NH, Department of Aviation

TC-2 & TC-4 BAGGAGE HANDLING SYSTEMS MODIFICATIONS PROJECT

MHT / CITY BID # FY25-805-04

Request for Bids



CONSTRUCTION PROJECT MANUAL

JUNE 2024

ISSUED FOR BIDDING

PREPARED BY:



AECOM TECHNICAL SERVICES, INC. 1155 ELM STREET, SUITE 401 MANCHESTER, NH 03101

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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 TC-2 & TC-4 BAGGAGE HANDLING SYSTEMS MODIFICATIONS PROJECT MHT / City Bid # FY25-805-04

This project consists of modifying the existing outbound Baggage Handling Systems (BHS) equipment, including baggage belt conveyors and flat-plate makeup carousels and related electrical power and control systems for Ticket Counter #2 (TC-2) and Ticket Counter #4 (TC-4) within the existing airport terminal building at Manchester-Boston Regional Airport, in Manchester, NH. Based on the Bid Documents to be issued by the Airport, the Contractor shall provide the final equipment and systems detailed designs, procurement, and construction services for this turnkey delivery project. The approximate value of the project is estimated to be between \$300,000 to \$400,000.

Bids will be accepted only from Contractors <u>that are pre-qualified</u> with the Department of Aviation. Refer to the Construction Contracts information available at the Manchester-Boston Regional Airport website at <u>https://www.flymanchester.com/doing-business-with-mht/procurement-services/</u> for the pre-qualification requirements. Prospective bidders for this project shall submit a pre-qualification application package in accordance with the instructions provided at the website above. <u>Pre-qualification packages</u> will be accepted for review anytime until **2:00 pm on July 22, 2024,** and the applicant will be notified of pre-qualification status within one business day following receipt of the pre-qualification package. <u>Pre-qualification packages will be accepted in hardcopy or in electronic PDF format submitted via email</u> to cadams@flymanchester.com.

<u>Bid Documents will be available</u> to be viewed and downloaded at 5:00 pm on <u>June 24, 2024</u>, at no cost, in Portable Document Format (.PDF) at the Manchester-Boston Regional Airport website at <u>https://www.flymanchester.com/doing-business-with-mht/procurement-opportunities/</u>.

A <u>Mandatory Pre-Bid Meeting and Site Tour</u> 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 <u>July 11, 2024 at 1:30 pm</u>. Prospective Bidders shall RSVP not less 24 hours prior to the meeting to Ms. Christina Adams at the Airport Administration Office who can be reached at (603) 624-6539 or by email at cadams@flymanchester.com.

<u>Bids will be received until</u> and publicly opened and read aloud on <u>July 24, 2024 at 2:00 pm</u> 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.

<u>All Bid-related inquiries shall be submitted in writing at any time until 2:00 pm (eastern time)</u> on July 17, 2024, to John G. Goudreault, P.E., Associate Vice President at AECOM, via email to John.Goudreault@aecom.com. Inquiries received after the deadline will not be accepted.

Title VI Solicitation Notice:

Manchester-Boston Regional Airport, in accordance with the provisions of Title VI of the Civil Rights Act of 1964 (78 Stat. 252, 42 USC §§ 2000d to 2000d-4) and the Regulations, hereby notifies all bidders or offerors that it will affirmatively ensure that for any contract entered into pursuant to this advertisement, businesses or disadvantaged business enterprises will be afforded full and fair opportunity to submit bids in response to this invitation and no businesses will be discriminated against on the grounds of race, color, national origin (including limited English proficiency), creed, sex (including sexual orientation and gender identity), or age in consideration for an award.

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SECTION 00 21 13 - INSTRUCTIONS TO BIDDERS

1.01 RECEIPT AND OPENING BIDS

The City of Manchester, Department of Aviation, Manchester, New Hampshire (herein called the Owner or Airport), invites Bids on the form attached hereto, all blanks of which must be appropriately filled in. Bids will be received by the Manchester-Boston Regional Airport Administration Offices on the third floor of the Airport Terminal located at One Airport Road, Suite 300, Manchester, NH 03103 until <u>2:00 p.m. on</u> July 24, 2024, and then at said office publicly opened and read aloud.

Bids will be accepted only from General Contractors <u>that are pre-qualified</u> with the Department of Aviation. Refer to Section 1.20 BIDDER'S QUALIFICATIONS below for additional information.

The envelopes containing the Bid must be sealed, addressed to the Airport and designated as:

Bid for: TC-2 & TC-4 BAGGAGE HANDLING SYSTEMS MODIFICATIONS PROJECT MHT / City Bid # FY25-805-04

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.

1.02 DESCRIPTION OF WORK

In general, this project consists of modifying the existing outbound Baggage Handling Systems (BHS) equipment, including baggage belt conveyors and flat-plate makeup carousels and related electrical power and control systems for Ticket Counter #2 (TC-2) and Ticket Counter #4 (TC-4) within the existing airport terminal building at Manchester-Boston Regional Airport, in Manchester, NH. Based on the Bid Documents to be issued by the Airport, the Contractor shall provide the final equipment and systems detailed designs, procurement, and construction services for this turnkey delivery project.

All areas of the airport disturbed by the Contractor's operations not within the construction limits as set forth by the Owner shall be restored at least equal to original condition at no cost to the Owner.

Most of the Work occurs in secure areas of the airport and will require security badge applications and training of Contractor personnel as appropriate.

Attention shall be directed to the Contract Documents for specific information of the Work to be performed.

1.03 ISSUANCE OF PROPOSAL (BID) FORMS

Bidders shall utilize proposal forms contained herein. 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 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 on previous contracts with the Owner.

1.04 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.

1.05 PREPARATION OF PROPOSAL

The Bidder shall submit his/her proposal on the forms contained herein. 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
- b. Bid Security Forms

1.06 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 pay items, 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 reason 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.

1.07 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.

1.08 DELIVERY OF PROPOSAL

Each proposal submitted shall be placed in a sealed envelope plainly marked with the project name, 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 advertisement before the time specified for opening all Bids. Proposals received after the bid opening time will be returned to the Bidder unopened.

1.09 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 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 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 on the basis of the summation of the products obtained by multiplying the estimated quantities shown in the proposal by the unit Bid prices. If a Bidder's proposal contains a discrepancy between unit bid prices written in words and unit Bid prices written in numbers, the unit price written in words shall govern.

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 Section 00 21 13, Subsection 6 titled, Irregular Proposals.

- b. If the Bidder is disqualified for any of the reasons specified in Section 00 21 13 subsection 12 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.

1.12 DISQUALIFICATION OF BIDDERS

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

- a. Submitting more than one proposal from the same partnership, firm, or corporation under the same or different name.
- b. 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.
- c. If the Bidder is considered to be in "default" for any reason specified in Section 00 21 13, subsection 3 titled, Issuance of Proposal Forms.
- d. Lack of competency as revealed by the financial statement, experience, or plant and equipment statements submitted.
- e. Lack of responsibility as shown by past work judged from the standpoint of workmanship and progress.
- f. Uncompleted work which, in the judgment of the Owner, might hinder or prevent the prompt completion of additional work if awarded.
- g. If the proposal is considered irregular in accordance with Section 00 21 13, subsection 6 titled, Irregular Proposals.
- h. 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 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 Contract shall be made by the Owner to the lowest, qualified Bidder whose proposal conforms to the cited requirements of the Owner.

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 Section 00 21 13 subsection 18 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 Section 00 21 13, subsection 11 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 Section 00 21 13, subsection 1.16 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

The successful Bidder shall sign (execute) the necessary Agreement Documents for entering into the Contract as included in the Project Manual and return such signed documents to the Owner, along with the fully executed Surety bond or bonds specified in Section 00 21 13, subsection 1.16 titled, Requirements of Contract Bonds, within 7 calendar days from the date of the Bidder's receipt of the Owner's Notice of Intent to Award Contract as delivered to the successful Bidder, unless otherwise specified herein or as directed by the Notice of Intent to Award Contract. If the Contract is mailed, registered mail is recommended.

1.18 APPROVAL OF CONTRACT

Upon receipt of the Contract and contract bond or bonds 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.

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 Section 00 21 13, subsection 1.17 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 for projects with an estimated cost in excess of \$250,000 must be pre-qualified.

Refer to the Construction Contracts information available at the Manchester-Boston Regional Airport website at <u>https://www.flymanchester.com/doing-business-with-mht/procurement-services/</u> for the pre-qualification requirements. Additionally, other prospective bidders for this project may submit a pre-qualification application package in accordance with the instructions provided at the website above. **Pre-qualification**

packages will be accepted for review anytime until **<u>2:00 pm on July 22, 2024</u>**, and the applicant will be notified of pre-qualification status (by email to the contact email address provided for such with the qualifications submittal) within one business day following receipt of the pre-qualification packages will be accepted in hardcopy or in electronic PDF format submitted via email to cadams@flymanchester.com.

The standard Pre-Qualification Application forms which are available for download on the Airport's website as noted above, <u>should be annotated on the front page to indicate the Pre-Qualification Application Package is submitted for this project</u>.

For Bids on projects with an estimated cost less than \$250,000, each Bidder not previously pre-qualified shall furnish the owner satisfactory evidence of his/her competency to perform the proposed work. Such evidence of competency, unless otherwise specified, shall consist of statements covering the Bidder's past experience on similar work, a list of equipment that would be available for the work, and a list of key personnel that would be available. In addition, each Bidder shall furnish the owner satisfactory evidence of his/her financial responsibility. Such evidence of financial responsibility, unless otherwise specified, shall consist of a confidential statement or report of the bidder's financial resources and liabilities as of the last calendar year or the Contractor's last fiscal year. Such statements or reports shall be certified by a public accountant. At the time of submitting such financial statements or reports, the Bidder shall further certify whether his/her financial responsibility is approximately the same as stated or reported by the public accountant. If the bidder's financial responsibility has changed, the Bidder shall qualify the public accountant's statement or report to reflect his/her (Bidder's) true financial condition at the time such qualified statement or report is submitted to the Owner.

Unless otherwise specified, a Bidder may submit evidence that he is pre-qualified with the State Highway Division and is on the current "bidder's list" of the state in which the proposed work is located. Such evidence of State Highway Division pre-qualification may be submitted as evidence of financial responsibility in lieu of the certified statements or reports hereinbefore specified.

Each Bidder shall submit "evidence of competency" and "evidence of financial responsibility" to the Owner at the time of Bid opening.

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 percent (1%) of the Bidder's total bid amount, at the request of the Owner:

- a. Name and address of Subcontractor,
- b. Brief description of work to be performed under subcontract,
- c. Price under subcontract,
- d. 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 must be acceptable to the Owner, and the owner reserves the right to reject the use of any subcontractor that it deems unsatisfactory.

1.24 TIME OF COMPLETION

The Bidder must agree to commence 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.

It is anticipated that the <u>Work will commence on 2 August 2024 and shall be substantially completed by 17</u> October 2024 for Phase-1 and 15 June 2025 for Phase-2 (Add-Alternate No. 1, if selected) with interim required milestone completion dates for the Work as specified in the Summary of Work Section 01 01 00.

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., Associate Vice President at AECOM, via email to John.Goudreault@aecom.com, and to be given consideration, must be received before 2:00 pm (eastern time) on July 17, 2024. 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 posted on the Airport's website and emailed to all prospective Bidders (at the respective address furnished for such purposes), not later than one (1) working day 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, and 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. Airport safety and security.
- e. Work by Others.

1.30 CONSTRUCTION SCHEDULE

The successful Bidder shall submit a Schedule outlining a proposed sequence of construction work plan identifying all key project milestones within 7 working days after execution of the contract or before the pre-construction meeting, whichever comes first.

END OF SECTION 00 21 13

SECTION 00 21 17 - PRE-BID CONFERENCE

DESCRIPTION

Pre-qualification of Construction Contractors is required on this project.

A mandatory pre-bid meeting and site tour will be held at the Airport administrative offices boardroom located on the third floor of the Airport Terminal at One Airport Road, Manchester, NH, on July 11, 2024, at 1:30 p.m.

<u>Prospective Bidders shall RSVP not less 24 hours prior to the meeting to Ms. Christina Adams at the</u> <u>Airport Administration Office who can be reached at (603) 624-6539 or by email at</u> <u>cadams@flymanchester.com.</u>

END OF SECTION 00 21 17

SECTION 00 41 00

PROPOSAL (BID) DOCUMENTS

MANCHESTER-BOSTON REGIONAL AIRPORT

for

TC-2 & TC-4 BAGGAGE HANDLING SYSTEMS MODIFICATIONS PROJECT MHT / City Bid # FY25-805-04

at

MANCHESTER-BOSTON REGIONAL AIRPORT

City of Manchester, New Hampshire

NOTE: The Bidder shall complete and submit the Proposal Documents in a sealed envelope as per instructions in Section 00 21 13.

PROPOSAL

for

MANCHESTER - BOSTON REGIONAL AIRPORT TC-2 & TC-4 BAGGAGE HANDLING SYSTEMS MODIFICATIONS PROJECT MHT / City Bid # FY25-805-04

at Manchester-Boston Regional Airport

Proposal of	*	hereinafter	called	"Bidder")	а
corporation organized under the laws of the State of			_, a part	nership, or	an
individual** doing business as		, to the	City of	Mancheste	er,
New Hampshire, Department of Aviation (hereinafter called "Own	er").			

The Bidder, _______ in compliance with your invitation for Bids for the construction of the Airport Terminal Building 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 at the amount in U.S. dollars provided herein. 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 written "Notice to Proceed" of the Owner, and to fully complete the Project within the specified contract period.

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

*The name of the Bidder must be exactly the same as the name under which the Bidder was prequalified with the City of Manchester.

** Strike out inapplicable terms.

Manchester - Boston Regional Airport TC-2 & TC-4 BAGGAGE HANDLING SYSTEMS MODIFICATIONS PROJECT BID FORM				
		BASE BID		
			FIGURE	5
ITEM DESIGNATION	QUANTITY / UNIT	(IN WORDS)	UNIT PRIC	CE
			Dollars	Cents
1	1/15	PHASE-1 : MU-4 INTEGRATION INTO MU-5		
		andCents		
ADD ALTERNATES				
ADD- ALTERNATE No. 1	1 / LS	PHASE-2: TC-2/MU-2 INTEGRATION INTO TC-1/MU-1 Dollars and Cents		
ADD- ALTERNATE No. 2	1 / LS	REPLACEMENT OF WEARING PARTS MU-4 and Cents		
ADD- ALTERNATE No. 3	1 / LS	REPLACEMENT OF WEARING PARTS MU-2 and Cents		

BID SUMMARY

TOTAL BASE BID (Item 1):

				dollars
		(amount in words)		
	(\$).	
	、 ————————————————————————————————————	(amount in figures)	,	
ADD-ALTERNAT	E No. 1:			
				dollars
		(amount in words)		
	(\$).	
		(amount in figures)	,	
TOTAL OF BASE	BID + ADD-AL'	TERNATE No. 1:		
				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., as necessary to perform all work required by the Contract Documents.

The Bidder agrees that the Owner may base Low Bid determination on the Base Bid plus any or all of the Additive 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 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 <u>execute the formal contract Agreement</u> <u>Documents attached within 7 calendar days</u> and deliver the Surety Bonds as required by the General Provisions. The Bid security attached in the sum of

(in words) 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:	
Submitted By:	
Name and Title:	
Business Address:	
Submitted 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	
the corporation named	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 s	nature thereto is genuine; and that said Proposal was duly signed, sealed and	
attested to for and in b	alf of said Corporation by authority of its governing body and is within the scope	
of its corporate power		
(<u>C</u> :	(Corporate Seal)	
(Signa		

*If said Corporation is a Sole Directorship, then a notarized statement indicating such and signed by the President / Sole Director shall accompany this certification.

ACKNOWLEDGMENT OF ADDENDA

Addendum No.		Date:
Addendum No.		Date:
Addendum No.		Date:
Addendum No.		Date:
Addendum No.	Date:	

END OF SECTION 00 41 00

SECTION 00 41 01

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

MANCHESTER - BOSTON REGIONAL AIRPORT TC-2 & TC-4 BAGGAGE HANDLING SYSTEMS MODIFICATIONS PROJECT MHT / City Bid # FY25-805-04

(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 fifteen (15) 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:

		SEAL	
		Individual Principa	l
		Durin and Address	
		Business Adaress	
			CE.
		Individual Principal	SE.
		Business Address	
Attest:			
		Corporate Principa	1
		Corporate Francipa	L
		Business Address	4.00*
			Affix Corporate
	D		Seal
Attest:	Ву:		
		Corporate Surety	
		Business Address	A FFix
			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

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 sig	nature, 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

AGREEMENT (CONTRACT) DOCUMENTS

MANCHESTER-BOSTON REGIONAL AIRPORT

for

MANCHESTER - BOSTON REGIONAL AIRPORT TC-2 & TC-4 BAGGAGE HANDLING SYSTEMS MODIFICATIONS PROJECT MHT / City Bid # FY25-805-04

at

MANCHESTER-BOSTON REGIONAL AIRPORT

City of Manchester, New Hampshire

This AGREEMENT, made this,	day of	by and
between the City of Manchester, New	Hampshire, Department of Aviation her	rein called "Owner", and
	, a	organized under the laws
of the State of	, hereinafter called "Contractor",	for the
MANCI TC-2 & TC-4 BACCA	HESTER - BOSTON REGIONAL AI CE HANDI INC SYSTEMS MODIE	RPORT ICATIONS PROJECT

MANCHESTER - BOSTON REGIONAL AIRPORT FC-2 & TC-4 BAGGAGE HANDLING SYSTEMS MODIFICATIONS PROJECT MHT / City Bid # FY25-805-04

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

ARTICLE 2. THE CONTRACT PRICE

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:

(in words)

(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) Specifications Project Manual
- f) Drawings (as listed in the Schedule of Drawings)
- g) 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:

through _____.

The Contractor agrees to complete work under this Contract within the time specified below.

ARTICLE 5. CERTIFICATES OF INSURANCE

The Contractor shall furnish Certificates of Insurance as described in Section 00 82 20 – Insurance Requirements, and shall list the policies as follows (or attach list of insurance information) :

Type of Insurance:	Coverage/Limits of Policy	Policy #/Insurance Co.	Expiration 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.

Such Certificates Of Insurance shall, with respect to comprehensive general liability, umbrella liability, and auto liability insurance, <u>name the City of Manchester, Department of Aviation and Department of Risk</u> <u>Management and the Engineer/Architect, AECOM Technical Services, Inc. as additional insured</u> (except worker's compensation). **IN WITNESS WHEREOF**, the parties to these presents have executed this Contract in two (2) counterparts each of which shall be deemed an original, as of the year and day first above mentioned.

(Affix corporate seal if by a corporation)	

ATTEST:

Witness

Witness

By: <u>Contractor</u>

Date

By: _

Department of Aviation

Date

SECTION 00 41 04

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

____),

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:

MANCHESTER - BOSTON REGIONAL AIRPORT

TC-2 & TC-4 BAGGAGE HANDLING SYSTEMS MODIFICATIONS PROJECT

MHT / City Bid # FY25-805-04

(Statement of Work/Project)

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.

	_, 20	In presence of:	ty of
			SEAL
		Individual Principal	
		Business Address	
			SEAL
		Individual Principal	
		Business Address	
Attest:			
		Corporate Principal	SEAL
Attest:	By:		
			SEA
		Corporate Surety	
		Business Address	
Countersigned:	By:		
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, wl	ho
signed the said bond on behalf of the principal was then	,	
of said Corporation; that I know his/her signature and his/h	her signature thereto is genuine; and that said	
bond was duly signed, sealed and attested to for and in beh	alf of said Corporation by authority of its	
governing body and is within the scope of its corporate por	wers.	

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.

SECTION 00 41 05

PAYMENT BOND

FORM OF PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS

That we,		,
an individual *, a partnership*, a corporation organized under the laws o	f 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 assig	gns, in the sum of	f
Dollars (\$), lawful
money of the United States of America, to and for the true payment whe	ereof, we bind ou	irselves 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:

(Enter Title and No. of Contract/Project)

MANCHESTER - BOSTON REGIONAL AIRPORT TC-2 & TC-4 BAGGAGE HANDLING SYSTEMS MODIFICATIONS PROJECT MHT / City Bid # FY25-805-04

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

* Strike out inapplicable terms.

NOW, THEREFORE, THE CONDITION Of this obligation is such that is the said Principal and his/her subcontractors shall pay for all labor performed or furnished, for all equipment hired, including trucks, for all material used or employed in such construction, including lumber so employed which is not incorporated in the work, and for fuels, lubricants, power, tools, hardware, and supplies purchased by said principal and used in carrying out said Contract, and for labor and parts furnished upon the order of said contractor for the repair of equipment used in carrying out said Contract, this agreement to make such payments being in

compliance with the requirements of Section 16 of Chapter 447, of New Hampshire Revised Statutes, Annotated, 1955, to furnish security there under and being in fact such security, and if said Principal shall well and fully 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 (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 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; (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.

IN WITNESS WHEREOF, we have set or	ar hands and seals to this bond, this day of
, 20	In presence of:

_SEAL

Individual Principal

Business Address

SEAL

Individual Principal

Business Address

Attest:

SEAL

Corporate Principal

By:_____

Attest:

SEAL

Corporate Surety

Business Address

Countersigned:

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 power	ers.	

_____ 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.
SECTION 00 71 00 - 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:

ACCEPTANCE. "Acceptance" is when the Architect determines that all of the Contract requirements have been completed (based on the closeout procedures set forth herein). A copy of Owner's 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 Architect during the bid 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.

AIR OPERATIONS AREA (AOA). 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. When designated, the Architect 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. 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 Architect and Owner require a formal bid be prepared and submitted for the work (see PROPOSAL).

BIDDER. The pre-qualified 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 in 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 Construction Documents, 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 Architect issues 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. The awarded Contract shall include, but is not limited to: The Advertisement; The Contract Form; The Proposal; The Performance Bond; The Payment Bond; any required insurance certificates; The Specifications; The Drawings, and all Addenda issued to Bidders.

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 Contract Documents; 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" mean and include (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 provided by the Architect 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 Architect or Owner, means as directed, designated, permitted, required, and accepted by the Architect and Owner.

ENGINEER. When designated, the 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.

EQUIPMENT. All machinery, together with the necessary supplies for upkeep and maintenance. 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 instruction, but which is found by the Architect 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 Architect 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 and systems are 100% complete and cleaned for the Owner's use. The Architect shall issue a Certificate of Final Completion.

FORCE ACCOUNT. Force account construction work is construction that is accomplished through the use of material, equipment, labor, and supervision provided by the Owner or by another public agency pursuant to an agreement with the Owner.

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.

INSPECTOR. An authorized representative of the Testing Agency 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 Drawings, 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 Architect and Owner is intended; and similarly, the words "reviewed", "approved", "acceptable", "satisfactory", or words of like import, shall mean reviewed by, approved by, or acceptable to, or satisfactory to the Architect and 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 laboratory of the Owner.

LESSEE. A person, company or corporation leasing space at the Airport from the Manchester-Boston Regional Airport Authority.

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, Department of Aviation, or other designee acting as the Owner's representative with respect to this project and its administration.

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

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.

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 GUARANTY. 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.

RECORD DOCUMENTS. A complete set of Contract Drawings indicating as constructed conditions prepared by the Contractor throughout the Project Work and delivered to the Architect for acceptance review upon Substantial Completion of the Project. Also Operation and Maintenance data provided by the Contractor to the Owner providing the operating instructions and maintenance data for the Contract specified equipment.

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 Architect 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.

STRUCTURES. Airport facilities such as bridges, culverts, catch basins, inlets, retaining walls, cribbing; storm and sanitary sewer lines; water lines; under drains; electrical ducts, manholes, hand holes, 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 Architect.

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

SUBSTANTIAL COMPLETION. "Substantial Completion" is when the Architect 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 Architect and Owner,

means sufficient, necessary, proper, acceptable, satisfactory, and desirable in the judgment of the Architect and Owner.

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

SUPPLEMENTAL INSTRUCTION. The form and procedure established to transmit information to the Contractor from the Architect to clarify or interpret the contract documents and to notify the Contractor of changes in the Work.

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.

TSA. The Transportation Security Administration. When used to designate a person, TSA shall mean the Administrator or his/her duly authorized representative.

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.

WORKING DAY. A working day shall be any day other than a legal holiday, Saturday, or Sunday on which the normal working forces of the Contractor may proceed with regular work for at least 6 hours toward completion of the contract. Saturdays, Sundays and holidays on which the Contractor's forces engage in regular work, requiring the presence of an inspector, will be considered working days.

END OF SECTION 00 71 00

SECTION 00 72 00 - CONDITIONS RELATING TO SCOPE OF WORK

1.01 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 provide all plans, labor, materials, equipment, tools, transportation, services, and supplies required to complete the Work in accordance with the Contract Documents,

1.02 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.

1.03 OMITTED WORK

The Owner 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 subsection titled PAYMENT FOR OMITTED WORK of Section 00 76 50.

1.04 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 Owner's opinion, is necessary for completion of such extra Work.

When determined to be in the Owner's best interest, the Owner may order the Contractor to proceed with extra Work by force account as provided in the subsection entitled, PAYMENT FOR EXTRA AND FORCE ACCOUNT WORK of Section 00 76 50.

Extra work 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 00 71 00, DEFINITION OF TERMS.

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

1.05 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 aircraft in the air operations areas of the airport, pedestrians and vehicles outside the Air Operations Area (AOA) with respect to his/her own operations and the operations of all his/her subcontractors.

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, road traffic, fire-rescue equipment, or maintenance vehicles at the airport.

The contract requires the maintenance of vehicular traffic on an existing road, street, highway, parking lots, pedestrian walkways 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 (MUTCD, 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, highways, parking lots, ramps and pedestrian bridges. 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, vehicular and pedestrian 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 aircraft and vehicular traffic specified in this subsection shall not be measured or paid for directly, but shall be included in the contract amount.

1.06 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.

1.07 FINAL CLEAN UP

Upon completion of the work and before acceptance and final payment will be made, the Contractor shall remove from the site all machinery, equipment, surplus and discarded materials, rubbish and temporary structures. Additional clean-up requirements are shown in Division 1 of the Contract Documents.

END OF SECTION 00 72 00

SECTION 00 72 20 - SITE CONDITIONS

1.01 SITE INVESTIGATION AND CONDITIONS AFFECTING THE WORK

The Contractor acknowledges that it has taken steps reasonably necessary to ascertain the nature and location of the Work, and that it has investigated and satisfied itself as to the general and local conditions which can affect the work or its cost, including but not limited to: (1) conditions bearing upon transportation, disposal, handling, and storage of materials; (2) the availability of labor, water, electric power, and roads; (3) the scope of work to be executed by others under other projects; (4) the character of equipment and facilities needed preliminary to and during work performance. Any failure of the Contractor to take the actions described and acknowledged in this paragraph will not relieve the Contractor from responsibility for estimating properly the difficulty and cost of successfully performing the Work, or for proceeding to successfully perform the Work without additional expense to the Owner.

1.02 DIFFERING SITE CONDITIONS

The Contractor shall promptly (no more than one day), and before the conditions are disturbed, give a written notice to the Owner as to (1) physical conditions at the site which differ materially from those indicated in this Contract, or (2) unknown physical conditions at the site of an unusual nature, which differ materially from those normally encountered and generally recognized as inherent in the Work of the character provided for in the Contract Documents.

The Architect / Engineer and Owner shall investigate the conditions related to the Contractor's Notice-To-Proceed promptly after receiving the notice. If the conditions do materially so differ and cause an increase or decrease in the Contractor's cost of, or the time required for, performing any part of the work under this contract, whether or not changed as a result of the conditions, a change order shall be made under this clause and the contract documents modified in writing in accordance with the changes clause and the Contract Documents modified in writing accordingly.

No request by the Contractor for an equitable adjustment to the Contract Documents under this clause shall be allowed unless the Contractor has given the written notice required.

No request by the Contractor for a change to the Contract for differing conditions shall be allowed if not made within 7 days of discovering the condition.

END OF SECTION 00 72 20

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SECTION 00 73 00 - CONDITIONS RELATING TO CONTROL OF WORK

1.01 CONFORMITY WITH PLANS AND SPECIFICATIONS

All work and all materials furnished shall be in conformity with the dimensions, layout and material requirements that are specified in the Contract Documents.

If the Architect finds the materials furnished, work performed, or the finished product not within reasonably close conformity with the Contract Documents but that the portion of the Work affected will, in his/her opinion, result in a finished product having an acceptable appearance, level of safety, durability, and workmanship, he/she will advise the Owner of his/her determination that the affected work be accepted and remain in place.

In this event, the Architect will document his/her determination and recommend to the Owner a basis of acceptance providing for an adjustment in the Contract price for the affected portion of the Work. The Architect's determination and recommended contract price adjustments will be based on good 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.

If the Architect finds the materials furnished, work performed, or the finished product are not in reasonably close conformity with the Contract Documents 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 Architect's written orders.

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 Documents. The term shall not be construed as waiving the Architect's right to insist on strict compliance with the requirements of the Contract Documents during the Contractor's prosecution of the work, when, in the Architect'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 Architect with the authority to use good 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 Documents.

The Architect shall not be responsible for the Contractor's means, methods, techniques, sequences, or procedures of construction or the safety precautions incident thereto.

1.02 COORDINATION OF CONTRACT, DRAWINGS, AND SPECIFICATIONS

The Contract, Drawings, Specifications, Addendum, 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 drawings or specifications. In the event the Contractor discovers any apparent error or discrepancy, he shall immediately submit a Request for Information to the Architect for his/her interpretation and decision, and such decision shall be final.

The entire Work provided in these Contract Documents 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 provided 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.

1.03 COOPERATION OF CONTRACTOR

The Contractor shall have available on the work site at all times one copy of all the Construction Documents. Copies of plans and specifications may be obtained by the Contractor 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 Architect, Owner and his/her inspectors and with other contractors in every way possible. 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 Architect. The superintendent shall not be replaced without written notice to and approval by the Architect and 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.

1.04 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 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 of a conflict arising between contractors, or a coordination dispute which cannot resolved by the Contractors, the Architect shall decide the conflict and his decision shall be final.

1.05 AUTHORITY AND DUTIES OF INSPECTORS

Inspectors employed by the Owner 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, or to act as foreman for the Contractor.

Inspectors employed by the Owner 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 and to reject

such nonconforming materials in question until such issues can be referred to the Architect for his/her decision.

1.06 INSPECTION OF THE WORK

All materials and each part or detail of the Work shall be subject to inspection by the Architect and Owner or his representatives. The Architect and Owner 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 Architect requests, 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 Construction Documents. 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 shall be at the Contractor's expense.

Any materials used without approval of the Architect may be ordered removed and replaced at the Contractor's expense.

1.07 REMOVAL OF UNACCEPTABLE AND UNAUTHORIZED WORK

All work not conforming to the requirements of the Contract Documents will be considered unacceptable, unless otherwise determined acceptable by the Architect 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 1.12 of Section 00 75 00.

Non-conforming work, 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 Architect made under the provisions of this subsection, the Owner 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.

1.08 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.

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.

1.09 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 Architect shall immediately notify the

Contractor of such non-compliance. 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 Architect's notification, the Owner 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.

1.10 PARTIAL ACCEPTANCE

If at any time during the prosecution of the Project the Contractor substantially completes a usable unit 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 unit. 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.

1.11 FINAL ACCEPTANCE

Upon due notice from the Contractor of substantial completion of the entire project, the Architect will make an inspection. If all construction provided for and contemplated by the contract is found to be completed in accordance with the Contract Documents, such inspection shall constitute the final inspection. The Architect shall notify the Contractor in writing of final acceptance as of the date of the final inspection.

If, however, the inspection discloses any work, in whole or in part, as being unsatisfactory, the Architect 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 Architect will make the final acceptance and notify the Contractor in writing of this acceptance as of the date of final inspection.

1.12 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 Documents or previously authorized as extra work, he shall notify the Architect 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 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 Architect 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 00 85 00.

1.13 ADDITIONAL INSTRUCTIONS AND DETAIL DRAWINGS

The Contractor shall be furnished additional instructions and detail drawings if necessary to carry out the Work included in the Contract. The drawings enumerated in Section 00 73 10 may be supplemented or superseded by such additional general and/or detail drawings as may be necessary or desirable as the work

progresses. 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.

The Contractor shall carry out the Work in accordance with the additional detail drawings and instructions. The Contractor and the Architect shall prepare jointly (a) a schedule, fixing the dates at which special detail drawings will be required, such drawings, if any, to be furnished by the Architect in accordance with said schedule, and (b) a schedule fixing the respective dates for the submission of shop drawings, the beginning of manufacture, testing and installation of materials, supplies and equipment, and the completion of the various parts of the work; each such schedule to be subject to change from time to time in accordance with the progress of the Work.

1.18 SHOP DRAWINGS AND SAMPLES

a. General

The Architect 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 Architect.

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 Architect'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 Architect'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 Architect'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 Architect.

c. Submission to Architect / Engineer

Before submittal to the Architect / Engineer, the Contractor shall check all shop drawings or samples for conformance with the Contract Documents 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 Architect 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 Architect 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 Architect for any part of the Contract work.

e. Resubmittal

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

f. Shop Drawings Required

The Architect may require, and the Contractor shall provide, shop drawings giving information on any part of the Contract work which in the opinion of the Architect are necessary or desirable to evaluate conformance to the Construction Documents.

1.19 RECORD DOCUMENTS AND OPERATIONS & MAINTENANCE DATA

A complete set of Contract Documents shall be kept at the job site that shall have all approved changes clearly and accurately marked on them by the Contractor in accordance with Section 01 78 08 – Record Documents. The Architect and Owner shall be entitled to rely upon the completeness and accuracy of the record document information provided by the Contractor without further verification.

Operations and maintenance data required by the Contract shall be provided in accordance with Section 01 78 09 - Operations and Maintenance Data.

Release of retainage shall not be authorized by the Architect until complete and accurate Record Documents and Operations and Maintenance Data are delivered to and accepted by the Architect. The Architect and Owner shall require a minimum of 30 days to review the Record Documents and Operating & Maintenance Data.

END OF SECTION 00 73 00

SECTION 00 73 04 - SPECIAL PROJECT PROCEDURES

1.01 DESCRIPTION

When the Work requires the Contractor to conduct his/her operations within an Aircraft Operations Area (AOA) of the airport, the Work shall be coordinated with the Owner at least 48 hours prior to commencement of such Work. The Contractor shall not close an AOA until so authorized by the Owner and until the necessary temporary marking and associated lighting is in place.

When the Work requires the Contractor to work within an AOA of the airport on an intermittent basis (intermittent opening and closing of a portion of the AOA), the Contractor shall maintain constant communications as hereinafter specified; immediately obey all instructions to vacate the AOA; immediately obey all instructions to resume work in such AOA. Failure to maintain the specified communications or to obey instructions shall be cause for suspension of the Contractor's operations in the AOA until the satisfactory conditions are provided.

1.02 AIR OPERATIONS AREA (AOA)

The Contractor will keep his personnel and equipment at least 50 feet from the edge of taxiways and aprons for aircraft movements.

Runway 17, 35 and 6 are the precision instrument runways at Manchester-Boston Regional Airport and may be used during IFR weather conditions, i.e., reduced visibility due to rain, fog, low clouds, etc. During IFR conditions, Contractor operations will be restricted to those operations which the Airport Operations Coordinator determines do not affect airport operations.

1.03 AIRPORT OPERATIONS SPECIALISTS

The Director of Operations and the Airport Operations Specialist shall have the authority to open and close facilities, issue and cancel NOTAM's, and coordinate with the airlines and other airport users.

At the completion of Work each day and prior to the opening of the runways, the Director of Operations, the Engineer, and the Contractor Superintendent shall inspect the facilities to be opened to insure they are ready for use. The Contractor shall immediately correct any deficiencies to the satisfaction of the Director of Operations designee in accordance with these specifications.

1.04 WEATHER LIMITATIONS

At the daily work meetings the Airport Operations Specialist will determine which areas can be worked in and discuss the weather forecast. Changing weather conditions may require the Contractor to remove his personnel and equipment from a given area upon one (1) hour's notice.

1.05 AIRPORT SECURITY

The Contractor shall comply with all airport security requirements and regulations as directed by the airport operations coordinator. Security regulations include the Transportation Security Administration (TSA) 49 CFR Part 1542 – Airport Security, as well as Airport rules and regulations.

The Contractor shall be responsible for controlling access to the work area and insuring that airport security is maintained at all times. The TSA can impose fines of \$11,000.00 or more for security violations and incursions into active aircraft operation areas. In addition, the Owner may impose fines and penalties for violations to Airport rules, regulations and security procedures. The Contractor shall pay all fines assessed against the airport due to violations caused by the Contractor and his personnel, subcontractors and vendors.

Security measures at the airport will require that the Contractor's employees park their personal cars in the areas designated by the Owner that purpose. Parking of personal cars at the work site will not be permitted. 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.

Trucks delivering material to an actual work area will be subject to search and provided with an escort unless the driver has been previously cleared for operating a vehicle on the airfield.

All orders for material shall instruct the supplier of the procedures to be followed.

The Contractor shall submit to the Owner within 10 days after signing of the Contract a written method of operations detailing the precautions he proposed for the control of vehicle traffic including flagmen, signs, escorts, search and identification procedures and any other measures he proposes. A signage and security plan for the project shall be included in this information and shall be approved by the Owner prior to the commencement of work. After approval of his/her operating schedule, security and signage, the Contractor shall follow it explicitly. The Owner may close the work at any time this schedule is violated so as to not endanger 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.

Controlled access points to the work area that impact the AOA shall be manned by an approved and trained gate guard. The Contractor shall contract through the Owner for gate guards.

All security arrangements shall be subject to the approval of the Owner.

The Contractor's personnel and vehicles will not have access to the entire airport, but shall be limited to the work area and the staging area.

1.06 FLAGPERSONS

The Contractor shall provide flagpersons at each active taxiway, and apron pavement being crossed by his/her equipment to assure that moving aircraft are given the right-of-way at all times. Flagpersons shall also be required when vehicles on a service road are crossing the approach to an active runway in addition to previously specified radio cars. The flagpersons shall be carefully selected and fully instructed as to their duties in regulating the Contractor's equipment crossing the aircraft pavement. They shall also be provided with broom, shovel, and brush and instructed to remove any debris that might be left by the equipment on the aircraft pavement where it might be ingested by an aircraft engine. Each Flagperson shall be provided with and shall wear at all times he/she is directing traffic, an approved striped vest of a type specifically designed for use by traffic control personnel.

The Contractor shall also provide flagpersons or uniformed officers at locations where the haul routes enter public streets or highways from airport property in accordance with the applicable local requirements.

1.07 BARRICADES

The Contractor shall furnish and place, as required, barricades to clearly define and close work areas to aircraft operations and prevent inadvertent access by vehicles and personnel.

The barricades shall be placed as directed by the Owner. The barricades shall be low profile type, a maximum of 24 inches high, shall be painted alternating bright orange and white and when used to define hazardous areas at night, shall be lighted in a manner approved by the Owner. No open flame lighting shall be used.

All temporary lights and barricades shall be weighted against jet blasts (100 mph).

1.08 OPERATIONAL SAFETY ON AIRPORT DURING CONSTRUCTION

Normal airport operation will be conducted on the airfield during construction and the Work shall be carried on in such a manner as not to interfere with the necessary operation of the airport. The Contractor shall take all precautions necessary to insure the safety of operating aircraft as well as his own equipment and personnel

All Contractors' operations shall be conducted in accordance with the provisions set forth within the current version of Advisory Circular 150/5370-2 and herein. The advisory circular conveys minimum requirements for operational safety on the airport during construction activities. The Contractor shall prepare and submit a safety plan that details how it proposes to comply with the requirements presented within the safety plan.

The Contractor shall implement all necessary safety plan measures prior to commencement of any work activity. The Contractor shall conduct routine checks of the safety plan measures to assure compliance with the safety plan measures.

The Contractor is responsible to the Owner for the conduct of all subcontractors it employs on the Project. The Contractor shall assure that all subcontractors are made aware of the requirements of the safety plan and that they implement and maintain all necessary measures.

No deviation or modifications may be made to the approved safety plan unless approved in writing by the Owner or Architect.

Specific requirements are as follows:

- a. When the Work requires the Contractor to conduct his/her operations within an AIR OPERATIONS AREA of the airport, the work shall be coordinated with airport operations at least 48 hours prior to commencement of such Work. The Contractor shall not close an AIR OPERATIONS AREA until so authorized by the Owner and until the necessary temporary marking and associated lighting is in place.
- b. When the Work requires the Contractor to work within an AIR OPERATIONS AREA (AOA) of the airport on an intermittent basis (intermittent opening and closing of the AIR OPERATIONS AREA), the Contractor shall maintain constant communications as hereinafter specified; immediately obey all instructions to vacate the AIR OPERATIONS AREA; immediately obey all instructions to resume work in such AIR OPERATIONS AREA. Failure to maintain the specified communications or to obey instructions shall be cause for suspension of the Contractor's operations in the AIR OPERATIONS AREA until the satisfactory conditions are provided.
- c. No construction operations shall be carried on within 50 feet from the edge of any taxiway or within 250 feet of the centerline of any active runway or within the limits of active runway approach zones unless prior approval has been obtained. When permission has been granted to work inside these limits, no equipment shall be left within the lines when not actually working. During lunch hour breaks in the daily work schedule, nights, weekends, and the days when work is not permitted or is not progressing, the equipment shall be located outside of these restriction lines. All booms shall be lowered when the equipment is not in operation. No construction operations, including an open flame such as welding or burning, shall be carried on near any aircraft.
- d. Each Contractor's motorized vehicle operating in an aircraft movement area shall be equipped with an amber flashing light and a 3 foot square flag consisting of international

orange and white squares not less than one foot square displayed in full view above the vehicle.

- e. In addition, all Contractor's vehicles shall have the company identification plainly visible on both sides of the vehicle in order to identify the vehicle.
- f. The Contractor shall obey all instructions as to the operation and routes to be taken by equipment traveling on Airport property. Any signs, lights, signals, markings, traffic control and other devices which may be required shall be provided and maintained by the Contractor during the course of the work, subject to the approval of the Owner. No aircraft pavement or navigation aid currently in services shall be left out of service overnight unless closed to all operations.
- g. The Contractor shall check all permanent and temporary lighting to assure its operating condition before leaving the job each day.
- h. The Contractor shall stake and permanently mark on the ground with a readily recognizable marking (football field marking or similar material) the restrictions lines parallel to the taxiways and runways adjacent to the work and the approach zone limits so that workers can readily recognize the limitations.
- i. For nighttime and twilight operation all cranes must be marked with red obstruction lights to provide increased conspicuity. Provide two or more flashing (L864) beacons at the highest point of each rig, installed in a manner to ensure an unobstructed view of one or more lights by a pilot.
- j. All crane booms must be painted aviation orange and topped with a 3-foot by 3-foot aviation orange and white checkerboard patterned flag. Such flag shall be up at all times when the crane is in operation during daylight hours. Flags must have a stiffener to keep them from drooping in calm wind.

1.09 HAUL ROUTES

When public highway must be used for haul routes, it will become the Contractor's responsibility to obtain the proper permits needed for this function and to obey rules and regulations pertinent to the public highways.

Haul routes on the Airport shall be as determined by the Owner. The Contractor shall stake or otherwise delineate the haul routes. The Contractor's vehicles and equipment shall operate within the limits of the marked haul route.

Contractor's vehicles will not be allowed access to portions of the Airport other than the work and staging areas.

1.10 INDOOR AIR QUALITY IMPROVEMENT

The Contractor shall implement the following procedures in an effort to improve indoor air quality during the Owner's occupancy:

a. All adhesives (for construction, floor and wall coverings), paints, thinners, solvents shall, among other technical qualifications, be selected in consideration to indoor air pollution. The use of these items in or near occupied areas is prohibited during normal operating hours;

- b. Provide maximum all-outside-air ventilation during the installation of strong emitting materials. This shall be done for the purpose of reducing the contamination of order materials by absorption of solvents and other volatile components;
- c. On projects where the Owner (or other user) occupies all or portions of the building during construction, the Contractor shall make every practical effort to minimize their exposure to fumes and dusts from construction. Such efforts shall include items a and b above, as well as the construction of temporary air-tight barriers, isolation of ventilation systems and all other appropriate means as determined by the Contractor.

END OF SECTION 00 73 04

SECTION 00 73 10 - SPECIFICATIONS AND DRAWINGS

1.01 DESCRIPTION

For convenience, the Specifications are arranged into 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.

1.02 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. Specifications Project Manual.
- d. Drawings. In case of discrepancy, calculated dimensions will govern over scaled dimensions.
- e. Cited standards for materials or testing.
- f. Cited FAA advisory circulars.
- g. 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 a conflict within the Specifications Project Manual, the more stringent shall apply.

END OF SECTION 00 73 10

SECTION 00 74 00 - CONTROL OF MATERIALS

1.01 SOURCE OF SUPPLY AND QUALITY REQUIREMENTS

The materials used in the Work shall conform to the requirements of the Contract Documents. Unless otherwise specified, such materials that are manufactured or processed shall be new (as compared to used or reprocessed).

In order to expedite the inspection and testing of materials, the Contractor shall furnish complete statements to the Architect as to the origin, composition, and manufacture of all materials to be used in the work. Such statements shall be furnished promptly after execution of the contract, but in all cases, prior to delivery of such materials.

It is the intent of this Contract that the use of asbestos containing materials and/or other hazardous materials be prohibited. Prior to Substantial Completion, the Contractor shall submit written certification that no asbestos and/or other hazardous substances have been incorporated into the Work.

1.02 SAMPLES, TESTS AND CITED SPECIFICATIONS

All materials used in the Work shall be reviewed by the Architect before incorporation in the Work. Testing shall conform to Contract Document requirements. All contractor provided testing costs to shall be absorbed by the Contractor and treated as incidental to the total Contract amount. Any work in which materials are used without approval or written permission of the Architect shall be performed at the Contractor's risk. Materials found to be unacceptable and unauthorized will not be paid for and, if directed by the Architect, shall be removed at the Contractor's expense. Unless otherwise designated, tests in accordance with the cited standard methods of AASHTO or ASTM which are current on the date of advertisement for bids will be made by and at the expense of the Contractor. All materials being used are subject to inspection, test, or rejection at any time prior to or during incorporation into the Work. Copies of all tests shall be furnished to the Architect and Owner. Owner's right to inspect and test materials to be used in the Work shall not diminish in any way the Contractor's responsibility for determining that all materials furnished for the work fully meet all requirements of the Contract Documents.

1.03 CERTIFICATION OF COMPLIANCE

The Architect may accept materials or assemblies when accompanied by manufacturer's certificates of compliance stating that such materials or assemblies fully comply with the requirements of the Contract. The certificate shall be signed by the manufacturer. Each lot of such materials or assemblies delivered to the Project shall be accompanied by a certificate of compliance in which the lot is clearly identified.

Materials or assemblies used on the basis of certificates of compliance may be sampled and tested at any time and if found not to be in conformity with Contract requirements will be subject to rejection whether in place or not.

The form of certificates of compliance shall be as approved by the Architect.

When a material or an assembly is specified by "brand name or approved equal" and the Contractor elects to furnish the specified "approved equal", the Contractor shall be required to furnish the manufacturer's certificate of compliance for each lot of such material or assembly delivered to the work. Such certificate of compliance shall clearly identify each lot delivered and shall certify as to:

a. Conformance to the specified performance, testing, quality or dimensional requirements and suitability of the material or assembly for the use intended in the Work.

Should the Contractor propose to furnish an "or approved equal" material or assembly, he shall furnish the manufacturer's certificates of compliance as hereinbefore described for the specified brand name material or assembly. However, the Architect shall be the sole judge as to whether the proposed "or approved equal" is suitable for use in the Work.

The Architect reserves the right to refuse permission for use of materials or assemblies on the basis of certificates of compliance.

1.04 IN-PLANT INSPECTION

The Architect, Owner or his/her authorized representative may inspect, at its source, any specified material or assembly to be used in the Work. Manufacturing plants may be inspected from time to time for the purpose of determining compliance with specified manufacturing methods or materials to be used in the work and to obtain samples required for his/her acceptance of the material or assembly.

Should the Owner's representative conduct plant inspections, the following conditions shall exist:

- a. Full cooperation and assistance of the Contractor and the producer with whom he has contracted for materials.
- b. Full entry at all reasonable times to such parts of the plant that concern the manufacture or production of the materials being furnished.

It is understood and agreed that the Owner shall have the right to retest any material which has been tested and approved at the source of supply after it has been delivered to the site. The Owner shall have the right to reject only material which, when retested, does not meet the requirements of the Contract Documents.

1.05 STORAGE OF MATERIALS

Materials shall be so stored as to assure the preservation of their quality and fitness for the Work. Stored materials, even though approved before storage, may again be inspected prior to their use in the Work. Stored materials shall be located so as to facilitate their prompt inspection. The Contractor shall coordinate the storage of all materials with the Owner. Materials to be stored on airport property shall not create an obstruction to air navigation nor shall they interfere with the free and unobstructed movement of aircraft. Unless otherwise shown on the plans, the storage of materials and the location of the Contractor's plant and parked equipment or vehicles shall be as directed by the Owner. Private property shall not be used for storage purposes without written permission of the storage of materials on private property. Upon request, the Contractor shall furnish the Owner a copy of the property owner's permission.

All storage sites on private or airport property shall be restored to their original condition by the Contractor at his/her entire expense, except as otherwise agreed to (in writing) by the owner or lessee of the property.

1.06 UNACCEPTABLE MATERIALS

Any material or assembly that does not conform to the requirements of the Contract Documents shall be considered unacceptable.

No rejected material or assembly, the defects of which have been corrected by the Contractor, shall be returned to the site of the Work until such time as the Architect has approved its used in the Work.

1.07 OWNER-FURNISHED MATERIALS

The Contractor shall furnish all materials required to complete the Work, except those specified herein (if any) to be furnished by the Owner. Owner-furnished materials shall be made available to the Contractor at the location specified herein.

All costs of handling, transportation from the specified location to the site of work, storage, and installing Owner-furnished materials shall be included in the bid for the contract item in which such Owner-furnished material is used.

After any Owner-furnished material has been delivered to the location specified, the Contractor shall be responsible for any demurrage, damage, loss, or other deficiencies which may occur during the Contractor's handling, storage, or use of such Owner-furnished material. The Owner will deduct from any monies due or to become due the Contractor any cost incurred by the Owner in making good such loss due to the Contractor's handling, storage, or use of Owner-furnished materials.

1.08 CONTRACTOR'S TITLE TO MATERIALS

No materials or supplies for the Work shall be purchased by the Contractor or by any Subcontractor subject to any chattel mortgage or under a conditional sales contract or other agreement by which an interest is retained by the seller. The Contractor warrants that he/she has good title to all materials and supplies used by him/her in the work, free from all liens, claims or encumbrances.

END OF SECTION 00 74 00

SECTION 00 75 00 - LEGAL REGULATIONS & RESPONSIBILITY TO PUBLIC

1.01 LAWS TO BE OBSERVED

The Contractor shall keep fully informed of all Federal and State laws, all local laws including Manchester – Boston Regional Airport rules and regulations, ordinances, regulations and security directives 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.

1.02 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.

1.03 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, 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 any third party 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.

1.04 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 Architect, 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 Documents. 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.

1.05 SANITARY, HEALTH, AND SAFETY PROVISIONS

Before beginning the Work, the Contractor shall notify the Architect and 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 or 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 of 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 Architect and 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 and accepted by the Owner.

1.06 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 Section 00 72 10 and shall limit such operations for the convenience and safety of the traveling public as specified in Section 00 76 00.

1.07 RESPONSIBILITY FOR DAMAGE CLAIMS

The Contractor shall indemnify, defend and hold harmless the Architect, and the Owner and their officers, employees, representatives, sub-consultants, 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.

1.08 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.

1.09 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 00 73 00.

No portion of the Work may be opened by the Contractor for public use until accepted 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.

1.10 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 00 73 00, 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

1.11 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, 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.

1.12 NO WAIVER OF LEGAL RIGHTS

Upon completion of the Work, the Architect and 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.

1.13 HAZARDOUS MATERIALS

- a. Hazardous Materials
- 1. 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 Airport Communications Center. As directed by the Owner, the Contractor shall be required to 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 Airport's Environmental Compliance Specialist will inspect hazardous material storage, including petroleum products. Hazardous materials shall be properly labeled to identify contents, stored out of contact with storm water, and shall not adversely affect water, soil, or air quality. The Contractor shall contact the Owner.
- 2. In the event of a spill, the Contractor's EPA Generator Identification number will be used on all documents for all disposal/removal purposes.
- 3. At no time shall any Contractor personnel work in a potentially hazardous environment unless certified to do so under 29 CFR 1910.
- 4. 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.
- b. Additional Considerations
 - 1. 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.

1.14 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.

1.15 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 there from, 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.

1.16 NOTICE AND SERVICE THEREOF

Any notice to the 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.

1.17 PRESS RELEASES

All press releases or other published information in any way concerning this Contract or the Work hereunder, which the Contractor of 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 for review and approval.

END OF SECTION 00 75 00

SECTION 00 76 00 - PROSECUTION AND PROGRESS

1.01 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 Architect.

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.

1.02 NOTICE TO PROCEED

The Notice To Proceed 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.

1.03 PROSECUTION AND PROGRESS

As specified in Section 01 30 28 – Progress Schedule, the Contractor shall submit his/her progress schedule to the Architect and Owner for review on or before the effective date of the Notice To Proceed. The Contractor's progress schedule, when approved, 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 Contract Documents within the time set forth in the Contract.

1.04 CONTROL OF OPERATIONS

When the Contractor is required to work within the AIRCRAFT OPERATIONS AREAS (AOA), the Contractor shall control his/her operations and the operations of his/her subcontractors and all suppliers so as to provide for the free and unobstructed movement of aircraft in the AOA.

1.05 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 Documents.

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.

Any person employed by the Contractor, any subcontractor and their agents who in the opinion of the Architect, 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 Architect, 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.

Should the Contractor fail to remove such persons or person, or fail to furnish suitable and sufficient personnel for the proper prosecution of the work, the Owner may suspend the Work by written notice until compliance with such orders.

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 Architect 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 judgement. 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 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.

1.06 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 Documents.

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.

1.07 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 Architect 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 Architect finds that the work was delayed because of conditions beyond the control and without the fault of the Contractor, the Architect 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.

1.08 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 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 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.

1.09 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.

1.10 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 extend 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 c. 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, whether 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.
- e. 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 1. 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, and shall reduce the settlement to reflect the indicated rate of loss.
- f. The reasonable costs of settlement of the work terminated, including:
 - 1. accounting, legal, clerical, and other expenses reasonably necessary for the preparation of termination settlement proposals and supporting data;
 - 2. the termination and settlement of subcontracts (excluding the amounts of such settlements); and
 - 3. storage, transportation, and other costs incurred, reasonably necessary for the preservation, protection, or disposition of the termination inventory.

1.11 WORK AREA, STORAGE AREA AND SEQUENCE OF OPERATIONS

The Contractor shall obtain approval from the Owner prior to beginning any work in all areas of the airport. No operating runway, taxiway, or Air Operations Area (AOA) shall be crossed, entered, or obstructed while it is operational. The Contractor shall plan and coordinate his/her work in such a manner as to insure safety and a minimum of hindrance to flight operations.

All equipment and materials shall not hinder the Runway Visual Range per AC 150/5300 nor hinder a runway to taxiway line of sight. No equipment will be allowed to park within the approach area of an active runway at any time. No equipment shall be within 250 feet of an active runway at any time, unless approved by Owner's representative.

1.12 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 00 75 00.

END OF SECTION 00 76 00
SECTION 00 76 50 - MEASUREMENT AND PAYMENT

1.01 DESCRIPTION

This Section describes the process involved in payment of the Contractor, including payment and submittal procedures, payment for stored materials, retainage, interim withholds, payment for extra and force account work, measurement, payment of subcontractors, payment of omitted items, acceptance and final payment, and audits.

1.02 PAYMENT

The Contractor shall receive and accept compensation provided for in the Contract as full payment for furnishing all materials, for performing all Work under the contract in a complete and acceptable manner, and for all risk, loss, damage, or expense of whatever character arising out of the nature of the Work or the prosecution thereof, subject to the provisions of Section 99 75 00, subsection NO WAIVER OF LEGAL RIGHTS.

Payment for Work performed on this Contract shall be based on the dollar value of completed Work in place.

The Contractor will break out itemized payments for major stored materials as individual activities.

When the "basis of payment" subsection of a technical specification requires that the contract price (price bid) include compensation for certain work or material essential to the item, this same work or material will not also be measured for payment under any other contract item which may appear elsewhere in the Contract Documents.

1.03 SUBMITTAL PROCEDURE

- a. Requests for payment will include the following steps:
 - 1. The Contractor submits to the Architect a marked-up copy of the previous month's schedule including his evaluation of the Work which has been completed in that period by percentage of activity complete.
 - 2. The Contractor, Owner and Architect shall conduct a joint review of all Record Documents to ensure that the field set is being maintained properly. Lack of current as-built conditions indicated on the Record Documents may result in payment delay.
 - 3. The Architect shall review submission within 5 days.
 - 4. The Contractor shall meet with the Owner and Architect to review and reach an agreement upon percentages. When an agreement cannot be reached, the Architect's value shall be used.
 - 5. The Contractor shall submit 4 copies of the Application for Payment on standard AIA G-series forms.
- b. The Contractor shall execute certification with signature of a responsible officer of the Contractor's firm, as the first signature on the Application for Payment.
- c. Progress Payments shall not be construed as acceptance of any part of the Work.

1.04 TIMING AND TURNAROUND OF PROGRESS PAYMENTS

Prior to submitting the first payment request, the Contractor shall have an approved construction schedule and a schedule of values for each element of work. Once the schedule of values has been accepted, it will be the basis of payment.

The Progress Payment Estimate prepared by the Contractor shall indicate the percentages of completion and the materials for which payments are to be requested. A review will be performed by the Architect and Owner to confirm that the general accounts are acceptable.

After agreement on final determination of quantities and their associated value, based on percent complete, the Contractor shall submit a completed Request For Payment for that pay period, and shall perform all extensions and arithmetic, and provide backup documentation, etc., on the prescribed forms.

The end date for each monthly pay period shall be established as the last day of each month. The payment request will be accompanied by certified payrolls, where required.

Where progress payments are approved prior to the 15th of the month, it is the intention of the Owner to make payments to the Contractor by the 20th of the following month. Failure on the part of the Owner to make said payment shall not be cause for an increase to cost unless such delay of payment exceeds 90 days from date of approval.

Final payment shall be in accordance with the Construction Agreement and General Conditions after all of the requirements of Section 01 78 00 – Project Closeout, have been met.

1.05 PAYMENT FOR MATERIALS ON HAND

- a. Submit separate schedule of prices of material and/or equipment to be stored on or off the work site. The schedule will show the quantities, prices and types of materials to be stored. Stored material prices shall be shown separately.
- b. Payment Requests may include the value of acceptable equipment and materials not yet incorporated into the work, provided that all of the following conditions are met:
 - 1. Such acceptable material/equipment are either furnished and delivered to the site or furnished and stored for use.
 - 2. Stockpiled material shall inspected by the Architect or Owner's authorized agents and shall be segregated and marked as the property of the City of Manchester/Department of Aviation. Transportation and travel expense to verify stored material will be at the Contractor's expense.
 - 3. After delivery of the material, if any inherent or acquired defects are discovered, defective material shall be removed and replaced with suitable material at the Contractor's expense.
 - 4. At his expense, the Contractor shall insure material against theft, fire, vandalism and malicious mischief and shall deliver the policy or certificate of such insurance to the Owner naming the City of Manchester, Department of Aviation as the insured. Insurance shall not be cancelable for at least 30 days and cancellation shall not be effective until certificate thereof is given to the Owner. Proof of insurance must be presented with each Request for Payment.

- 5. Submit bills of sale or paid invoices for all stored materials on which payment is requested. Payment for stored materials will only be approved for major equipment and materials in excess of \$10,000.
- 6. Nothing in the above conditions shall relieve the Contractor of his responsibility for incorporating material into the work in conformity with the Contract Documents.
- 7. Maximum payment for stored products will be the cost of the item plus applicable taxes. Submit supplier's invoice and receipt as evidence of purchase and payment. Such payment shall in no case exceed the bid price for the item of work for which the equipment or material is furnished.
- 8. The Contractor has furnished the Architect with acceptable evidence of the quantity and quality of such stored or stockpiled materials.
- 9. The Contractor has furnished the Architect with satisfactory evidence that the material and transportation costs have been paid.
- c. The Contractor, in submitting an Application for Payment certifies that he has visited all locations of materials and equipment stored off-site and verified the types and quantities of materials and equipment stored, as well as the suitability and security of the storage facilities
- d. Title to stockpiled material shall be vested in the Owner at time of payment to the Contractor.
- e. It is understood and agreed that the transfer of title and the Owner's payment for such stored or stockpiled materials shall in no way relieve the Contractor of his/her responsibility for furnishing and placing such materials in accordance with the requirements of the contract, plans, and specifications.
- f. In no case will the amount of partial payments for materials on hand exceed the contract price for such materials or the contract price for the contract item in which the material is intended to be used.
- g. No partial payment will be made for stored or stockpiled living or perishable plant materials.
- h. The Contractor shall bear all costs associated with the partial payment of stored or stockpiled materials in accordance with the provisions of this subsection.

1.06 RETAINAGE

From the total of the amount determined to be payable on a progress payment, 10 (ten) percent of such total amount will be deducted and retained as further security for the full performance of the Contract work. The balance (90 percent) of the amount payable, less all previous payments, shall be certified for payment.

Upon substantial completion of all Work the Contractor shall make a request in writing to the Architect requesting the remainder of the Contract price for the work be paid to him. If the Work is substantially and satisfactorily completed as determined by the Architect, the Contractor shall be paid the remainder of the Contract price for the Work, as increased or decreased in accordance with the terms of the Contract, less two times the value of any remaining items to be completed, as determined by the Architect, less an amount necessary to satisfy claims, liens or judgments against the Contractor which have not been satisfactorily

resolved, and subject to the deduction of liquidated damages for delay; if any, and to any other provision of the Contract expressly permitting the withholding or deduction of monies by the Owner.

The Owner shall retain the right to withhold full retainage until such time as acceptable Record Documents and Operations & Maintenance manuals and data are submitted to and accepted by the Owner.

1.07 PAYMENT FOR EXTRA AND FORCE ACCOUNT WORK

Extra work will be paid for at the agreed prices specified in the change order or supplemental agreement authorizing the extra work. When the change order or supplemental agreement authorizing the extra work requires that it be done by force account, such force account shall be measured and paid for based on expended labor, equipment, and materials plus a negotiated and agreed upon allowance for overhead and profit.

- a. Miscellaneous. No additional allowance will be made for general superintendence, the use of small tools, or other costs for which no specific allowance is herein provided.
- b. Comparison of Record. The Contractor and the Owner shall compare records of the cost of force account work at the end of each day. Agreement shall be indicated by signature of the Contractor and the Owner or their duly authorized representatives.
- c. Statement. No payment will be made for work performed on a force account basis until the Contractor has furnished the Owner with duplicate itemized statements of the cost of such force account work detailed as follows:
 - 1. Name, classification, date, daily hours, total hours, rate and extension for each laborer and foreman.
 - 2. Designation, dates, daily hours, total hours, rental rate, and extension for each unit of machinery and equipment.
 - 3. Quantities of materials, prices, and extensions.
 - 4. Transportation of materials.
 - 5. Cost of property damage, liability and workman's compensation insurance premiums, unemployment insurance contributions, and social security tax.

Statements shall be accompanied and supported by a receipted invoice for all materials used and transportation charges. However, if materials used on the force account work are not specifically purchased for such work but are taken from the Contractor's stock, then in lieu of the invoices the Contractor shall furnish an affidavit certifying that such materials were taken from his/her stock, that the quantity claimed was actually used, and that the price and transportation claimed represent the actual cost to the Contractor.

1.08 PARTIAL PAYMENTS

Partial payments will be made at least once each month as the Work progresses. Said payments will be based upon estimates prepared by the Contractor and reviewed by the Architect and Owner of the value of the work performed and materials complete in place in accordance with the contract, plans, and specifications. Such partial payments may also include the delivered actual cost of those materials stockpiled and stored in accordance with the subsection titled PAYMENT FOR MATERIALS ON HAND of this Section.

a. No partial payment will be made when the amount due the Contractor since the last estimate amounts to less than five hundred dollars.

- b. From the total of the amount determined to be payable on a partial payment, 10 percent of such total amount will be deducted and retained by the Owner until the final payment is made, except as may be provided (at the Contractor's option) in the subsection titled PAYMENT OF WITHHELD FUNDS of this Section. The balance (90 percent) of the amount payable, less all previous payments, shall be certified for payment. Should the Contractor exercise his/her option, as provided in the subsection titled PAYMENT OF WITHHELD FUNDS of this section, no such 10 percent retainage shall be deducted.
- c. When not less than 95 percent of the Work has been completed, the Contractor may, at the Owner's discretion and with the consent of the surety, prepare an estimate from which will be retained an amount not less than twice the contract value or estimated cost, whichever is greater, of the work remaining to be done. The remainder, less all previous payments and deductions, will then be reviewed by the Architect for payment to the Contractor.
- d. It is understood and agreed that the Contractor shall not be entitled to demand or receive partial payment based on quantities of work in excess of those provided in the proposal or covered by approved change orders or supplemental agreements, except when such excess quantities have been determined by the Architect to be a part of the final quantity for the item of work in question.
- e. No partial payment shall bind the Owner to the acceptance of any materials or work in place as to quality or quantity. All partial payments are subject to correction at the time of final payment as provided in the subsection titled ACCEPTANCE AND FINAL PAYMENT of this section.
- f. In accordance with State and Local regulation that shall not void the Contract, the Contractor shall deliver to the Owner a complete release of all claims for labor and material arising out of this contract before the final retained percentage or final payment is made. If any subcontractor or supplier fails to furnish such a release in full, the Contractor may furnish a bond or other collateral satisfactory to the Owner to indemnify the Owner against any potential lien or other such claim. The bond or collateral shall include all costs, expenses, and attorney fees the Owner may be compelled to pay in discharging any such lien or claim.

1.09 PAYMENT OF SUBCONTRACTORS

The Contractor agrees to pay each subcontractor under this Contract for satisfactory performance of its contract no later than ten (10) days from the receipt of each payment the Contractor receives from the City of Manchester, Department of Aviation. The Contractor agrees further to return retainage payments to each subcontractor within ten (10) days after the subcontractor's work is satisfactorily completed. Any delay or postponement of payment from the above referenced time frame may occur only for good cause following written approval of the City of Manchester, Department of Aviation. This cause applies to both DBE and non-DBE subcontractors.

The Owner shall monitor and enforce compliance with prompt payment requirements by requiring release and waiver of liens from all subcontractors and major material suppliers on a monthly basis. The Contractor shall submit the release and waiver liens with their submittal of any partial or final payment request. The subcontractors or suppliers shall certify that they have received payment current to the previous Contractor's payment request for which the Owner had processed payment. A sample release form is provided at the end of this Section.

1.10 PAYMENT FOR OMITTED WORK

As specified in the subsection titled OMITTED WORK of Section 00 72 00, the Owner shall have the right to omit from the Work (order nonperformance) any contract item, including major contract items, in the best interest of the Owner. Omitted work will be deleted by change order. Acceptable materials ordered by the Contractor or delivered on the work prior to the date of the Owner's order will be paid for at the actual cost to the Contractor and shall thereupon become the property of the Owner.

In addition to the reimbursement hereinbefore provided, the Contractor shall be reimbursed for all actual costs incurred for the purpose of performing the omitted contract item prior to the date of the Owner's order. Such additional costs incurred by the Contractor must be directly related to the deleted contract item and shall be supported by certified statements by the Contractor as to the nature the amount of such costs.

TO: City of Manchester, Dept. of Aviation One Airport Road, Suite #300 Manchester, NH 03103

CONTRACT NO:

CONTRACT FOR:

CONTRACT DATE:

PROJECT:

In accordance with the provisions of the Contract between City of Manchester NH, Department of Aviation and the Contractor, as indicated above, the (here insert name and address of Surety Company)

_____,SURETY COMPANY,

on bond of (here insert name and address of Contractor)

_,CONTRACTOR,

hereby approves of the final payment to the Contractor, and agrees that final payment to the Contractor shall not relieve the Surety Company of any of its obligations to

Manchester-Boston Regional Airport One Airport Road, Suite #300 Manchester, NH 03103

As set forth in the said Surety Company's Bond.

IN WITNESS WHEREOF, The Surety Company has hereunto set its hand this day of 20

Surety Company

Signature of Authorized Representative

Attest: (Seal):

Title

1.11 ACCEPTANCE AND FINAL PAYMENT

When the contract work has been accepted in accordance with the requirements of the subsection titled FINAL ACCEPTANCE of Section 00 73 00, the Contractor will prepare the final cost statement of work actually performed. The Owner shall approve the Contractor's final cost statement or advise the Contractor of his/her objections to the final cost statement which are based on disputes in measurements or computations of the final quantities to be paid under the contract as amended by change order or supplemental agreement. The Contractor and the Owner shall resolve all disputes (if any) in the measurement and computation of final quantities to be paid within 30 calendar days of the Owner's receipt of the Contractor's final estimate. If, after such 30-day period, a dispute still exists, the Contractor may accept the Owner's final quantities under protest of the quantities in dispute, and such disputed quantities shall be considered by the Owner as a claim in accordance with the subsection titled CLAIMS FOR ADJUSTMENT AND DISPUTES of Section 00 73 00.

After the Owner has approved, the Contractor's final cost statement, final payment will be processed based on the entire sum, or the undisputed sum in case of acceptance under protest determined to be due the Contractor less all previous payments and all amounts to be deducted under the provisions of the contract. All prior progress estimates and payments shall be subject to correction in the final estimate and payment.

If the Contractor has filed a claim for additional compensation under the provisions of the subsection titled CLAIMS FOR ADJUSTMENTS AND DISPUTES of Section 00 73 00 or under the provisions of this subsection, such claims will be considered by the Owner in accordance with local laws or ordinances. Upon final adjudication of such claims, any additional payment determined to be due the Contractor will be paid pursuant to a supplemental final cost statement.

1.12 AUDIT

- a. The Owner shall have the right to examine and audit all books, estimates, records, contracts, documents, bid documents, subcontracts, and other data of the Contractor (including computations and projections) related to negotiating, pricing, or performing the modification in order to evaluate the accuracy, completeness, and currency of the cost or pricing data at no additional cost to the Owner.
- b. The Contractor shall make available at its office at all reasonable times the materials described in paragraph (a) above, for examination, audit, or reproduction, until 4 years after final payment under this contract.
- c. The Contractor shall insert a clause containing all the provisions of this clause, including this paragraph (c), in all subcontracts over \$10,000 under this contract.

1.13 PAYMENT APPLICATION FORMS

- a. Use AIA Document G702 and continuation sheets G703 for lump sum contracts.
- b. Contractor computer generated formats may be used subject to approval from the Owner.
- c. Subcontractor and Supplier release and waiver of liens and claims forms

END OF SECTION 00 76 50

SECTION 00 82 20 - INSURANCE REQUIREMENTS

1.01 INSURANCE

CONTRACTOR AGREEMENT

INDEMNIFICATION AND INSURANCE REQUIREMENTS:

The consideration of the utilization of Contractor's services by the City of Manchester and other valuable consideration, the receipt of which is hereby acknowledged, Contractor agrees that all persons furnished by Contractor shall be considered the Contractors 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 and Architect and their respective employees, agents, officers, sub-consultants 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 and Architect arising in favor of any party, including claims, liens, debts, personal injuries, including employees of the Owner, Authority or Architect death or damages to property (including property of the Owner, Authority or Architect) 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. <u>Comprehensive General Liability insurance</u> written on occurrence form, including completed operations coverage, personal injury liability coverage, broad form property damage liability coverage, XCU 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. <u>Automotive liability insurance</u> 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 limit for bodily injury and property damage.
- C. <u>Excess Liability Coverage, or Umbrella Coverage</u>, for Commercial General Liability and Automobile Liability shall be \$ 5,000,000.
- D. <u>Worker's compensation insurance</u> whether or not required by the New Hampshire Revised Statutes Annotated, 1955, as amended, with statutory coverage and including employer's liability insurance with limits of liability of at least \$100,000 for each accidental injury and, with respect to bodily injury by disease, \$100,000 each employee and \$500,000 per policy year.
- E. <u>The Contractor will provide All-Risks Builder's Risk Insurance</u> 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.

- F. 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.
- G. Insurance companies utilized must be admitted to do business in New Hampshire or be on the Insurance Commissioners 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.
- H. Contractor agrees to furnish certificate(s) of the above mentioned insurance to the Manchester -Boston Regional Airport at the same time as or within seven (7) 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, <u>name the City of Manchester Department of Aviation, the</u> <u>City of Manchester Department of Risk Management, and the Architect / Engineer: AECOM</u> <u>Technical Services, Inc. as an addition insured (except worker's compensation)</u> and, with respect to all policies shall state that in the event of cancellation or material change, written notice shall be given to the Manchester • Boston Regional Airport, at the Airport Administration office at One Airport Road, suite 300, Manchester, New Hampshire, 03103 at least thirty (30) days in advance of such cancellation or change.
- I. The purchase of the insurance required or the furnishing of the aforesaid certificate shall not be a satisfaction of Contractor's liability hereunder or any way modify the Contractor's indemnification responsibilities to the Manchester Boston Regional Airport.
- J. It shall be the responsibility of Contractor to ensure that all subcontractors comply with the same insurance requirements that he is required to meet.

1.02 SPECIAL HAZARDS

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

a. Damage or injury to aircraft or persons in aircraft operating on or near the project site, resulting from any operations under this Contract.

END OF SECTION 00 82 20

SECTION 00 84 00 - EXTENSIONS OF TIME AND LIQUIDATED DAMAGES

1.01 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.
- 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. Notice
 - 1. 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 Architect in writing of such delay and its cause, in order that the Architect and 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.
- c. 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:

- 1. 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.
- 2. 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 Architect, after receipt of such justification and supporting evidence, shall make its finding of fact. The Architect's decision shall be final and conclusive, and the Architect shall advise the Contractor in writing of such decision. If the Architect finds that the Contractor is entitled to any extension of contract time, the Architect'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 updating of the schedule.

1.02 LIQUIDATED DAMAGES

a. If the planned work assigned relating to the tie-in / cut-over of the outbound baggage make up devices is not completed within the constraints of the agreed upon duration of the equipment outage as pre-arranged with the Owner during the coordination of the work during the project, or the Contractor causes an unplanned shutdown outage of the baggage handling system that prevents Airline or TSA operations, then at the 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** <u>*Five Hundred Dollars (\$500.00) for each HOUR* of system outage or operational delay, or proportional part thereof.</u>

END OF SECTION 00 84 00

SECTION 00 85 00 - DISPUTES - CLAIMS

1.01 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 Architect 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 Architect for a written decision. A claim by the Owner against the Contractor shall be provided to the Contractor in writing.

1.02 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 Architect 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 Architect 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 Architect 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 night 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 Architect will review the issue and within thirty (30) days from receipt of the Contractor's claim render a final determination.

1.03 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.

1.04 CLAIM FORMAT

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, Supplemental Instructions, Requests for Information.
 - 4. Construction Change Directive.
 - 5. Cost Proposals.
 - 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 00 85 00

SECTION 01 01 00 - SUMMARY OF WORK

1.01 DESCRIPTION

- a. This Section includes a description of the Contractor's responsibilities in regard to the Scope of Work included in the Contract, the phasing and sequence of the work, progress and completion of the Project including scheduling milestones / requirements, examination of the site and work, contractor submittals and approvals, the Contractor's use of the premises, the protection of existing utilities, protective measures, and contractor management / coordination.
- b. Project Identification: Manchester Boston Regional Airport | TC-2 & TC-4 Baggage Handling Systems Modifications Project | MHT / City Bid # FY25-805-04
- c. Project Location: Manchester-Boston Regional Airport, One Airport Road, Manchester, NH 03103
- d. Owner: City of Manchester, NH, Department of Aviation, also may be referred to as "Airport" or "MHT" in these or other related documents
- e. Architect / Engineer Identification: The Contract Documents were prepared for this Project by AECOM Technical Services, Inc. (AECOM), 1155 Elm Street, Suite 401, Manchester, NH 03101

1.02 RELATED DOCUMENTS

- a. Plans (Drawings) and all provisions of the Contract Documents, including Bid Forms and Contract Requirements and other Division Specification Sections, apply to this Section.
- b. Work either described or called for by this section or as may or may not be noted in other parts of the Contract Documents shall be considered as called for by both.
- c. Specification Format: The Specifications are organized into Divisions and Sections based on the CSI "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 included in the Contract Documents.
 - 2. Specifications and Plans Notes Content: The Specifications and notes provided on the Plans 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:

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.

Imperative mood and streamlined language are generally used in the Specifications and Plans notes. 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.

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.

3. Materials and work requirements specifications / notes are provided on the Plans to a significant extent which shall be considered part of and/or supplementary to technical specifications provided in the Project Manual . All necessary material and work (temporary and permanent) for the complete and functional code compliant installation as defined by the intent of the Contract Documents shall be included in the Contractor's Scope of Work and Bid Proposal, whether or not specifically shown, detailed, or noted on the plans.

Materials, products, and appurtenances called for on the plans by notation of a Make / Model / Manufacturer etc., are done so as basis of design (specification) and shall be subject to "Or Approved Equal" upon consideration of the Contractor's product data submittal to the Owner in accordance with Specification Sections 01 30 00, 01 30 10, 01 60 01, and 34 77 39.

All materials, products, and appurtenances shall be confirmed by the Contractor to be as recommended by the manufacturer for the application(s) in this project and shall be installed in accordance with the manufacturers written instructions.

Colors for materials, products, and appurtenances shall be as specified, or otherwise selected by the Owner from the manufacturer's standard available colors pallet and/or submitted samples.

Necessary materials, products, and appurtenances that may not specified on the plans shall be provided in accordance with best industry standards and practices, subject to data submittal to the Owner.

1.03 WORK COVERED BY CONTRACT DOCUMENTS

- a. The Manchester Boston Regional Airport TC-2 & TC-4 Baggage Handling Systems Modifications Project consists of modifying the existing outbound Baggage Handling Systems (BHS) equipment, including baggage belt conveyors and flat-plate makeup carousels and related electrical power and control systems for Ticket Counter #2 (TC-2) and Ticket Counter #4 (TC-4) within the existing airport terminal building at Manchester-Boston Regional Airport, in Manchester, NH. Based on the Bid Documents to be issued by the Airport, **the Contractor shall provide the final equipment and systems detailed designs, procurement, and construction services for this turnkey delivery project**. Refer to Section 34 77 39 Turnkey Baggage Handling System - Performance Specification.
- b. Background:

The TSA is removing the two existing outdated baggage inspection units that previously serviced TC-2 and TC-4. The Airport is removing the related portions of the baggage conveyor systems that will no longer be necessary to convey checked baggage into/out of those units from the baggage check-in positions at the respective ticket counters. The modifications to the BHS equipment included in this project are required to reroute baggage to other baggage inspection units in order to maintain baggage check-in operations at TC-2 and TC-4.

The newer existing TSA baggage inspection equipment that currently services Ticket

Counter #1 (TC-1) and Ticket Counter #5 (TC-5) has the additional capacity to process baggage that will be checked at TC-2 and TC-4. This project includes required modifications to interconnect the baggage check-in position conveyors for TC-2 to TC-1 and for TC-4 to TC-5, and modifications to combine the respective outbound baggage Make-Up (MU) Carousels MU-2 to MU-1 and MU-4 to MU-5.

In order to interconnect the baggage handling systems, the direction of travel for the TC-2 and TC-4 conveyors and MU-2 and MU-4 carousels needs to be reversed.

Additionally, the power and controls for the TC-2 baggage check-in conveyors and the MU-2 carousel must be reworked to be sourced from the existing TC-1 Motor Control Panel (TC1-MCP), and the power and controls for TC-4 baggage check-in conveyors and MU-4 carousel must be reworked to be sourced from the existing TC-5 Motor Control Panel (TC5-MCP). The power and controls work for the TC-4 baggage check-in conveyors interconnection is being designed and performed by the Owner/others.

The final detailed electrical designs as provided by the turnkey project Contractor shall be performed by a Professional Electrical Engineer licensed in the State of New Hampshire or by those under the direct responsible control of the engineer and the design shall be certified/sealed by said NH-registered Professional Engineer. Basic electrical work specifications and general notes have been included in the Contract Documents as minimum requirements and basis of design; however, the final electrical work and component requirements shall be determined by the design engineer in accordance with all applicable codes and industry standards.

c. The detailed design, procurement, and construction work associated with this turnkey delivery project is planned in two phases as follows:

PHASE-1 : MU-4 INTEGRATION INTO MU-5BASE BID

In this phase the baggage check-in position conveyor for TC-4 will be tied into the TC-5 baggage check-in position conveyor, and the outbound baggage Make-Up (MU-4) carousel will be tied into the MU-5 carousel.

The modifications in this Phase shall be performed in multiple Steps to minimize the duration of service outages for the TC-5 and MU-5 systems at the time of tie-in and recommissioning.

The Owner (Airport) is currently making the modifications to the baggage check-in position conveyors for the TC-4 to TC-5 interconnection (partial work in Step 1 and Step 2) utilizing existing conveyor sections removed from TC-2, therefore the related work shown on the Plans is clouded and noted as Not In Contract (N.I.C.). The existing drive units for TC-4 have been removed and stored, the existing drive units from TC-2 have been installed at TC-4, and the remainder of the TC-2 baggage check-in conveyor sections have been removed and stored onsite by the Owner for the Contractor's reuse and installation in Phase 2 of the project.

The Contract Base Bid shall include all mechanical, structural frame & anchorage, and electrical power and controls work for the MU-4 carousel interconnection to the MU-5 carousel (Step 1 through Step 4) as shown and noted on the Plans. Variations in the planned construction sequence / steps may be made by the Contractor in the final work plan as necessary based on detailed design and existing conditions verifications provided the contract cost and milestone schedule dates are not affected.

Step 1: The work in Step 1 shall include removal and modification of the existing MU-4 drive unit and reinstallation into the carousel section on the south side of the building wall.

The displaced section of the carousel will then be modified and installed in the former location of the drive unit. During this modification, the Contractor shall clean, inspect, lubricate, and adjust existing MU-4 components as noted and provide an inspection report to the Owner with condition assessment of the parts observed and locations of any deficiencies.

The operation of MU-4 in the reverse direction shall be tested and proven using temporary extension of the existing power and control from TC4-MCP and accepted by the Owner. Subsequent to reverse operation testing, the power and controls for MU-4 shall be disconnected from TC4-MCP and connected to TC5-MCP. This work includes making modifications to TC5-MCP hardware and programing to accommodate the new loads and connections for the MU-4 components, including potential extension of the enclosure or addition of a supplementary enclosure as may be determined to be required by the electrical engineer. The modifications to TC5-MCP that require the system to be de-energized shall be performed during short-duration outage periods of non-activity by the Airlines as determined/approved by the Owner, which may require off-shift or nightwork.

The installation of electrical conduits to be routed from MU-4 to TC5-MCP that may be above the ceilings in the TC-5 inspection room area shall not take place during active TSA baggage inspection periods and may require limited start-stop work periods or off-shift and night work.

The power and controls for MU-4 to be integrated into TC5-MCP shall be initially tested during short-term outage periods of non-use of TC-5 / MU-5 which may require off-shift or nightwork. MU-4 shall then be disconnected from TC5-MCP for further equipment modifications.

Concurrently with the work to be performed on MU-4 in step 1 above, the sections of carousel to be taken from MU-2 that will be used for extension of MU-4 shall be removed and modified as necessary. The extension sections that will be utilized for the part of MU-4 that is on the north side of the wall shall be transported through the wall opening when vacated by the MU-4 end section removal in Step 2 and then staged in the TC-4 inspection room for use in Step 3 and Step 4.

Step 2: The work in Step 2 shall include removal of the fire-shutter and the end section of MU-4 and other preparations as may be necessary for the carousel extension work including staging the north side MU-4 extension sections in the MU-4 inspection room.

The Owner will install 2-hour fire rated wall in-fill closures for the openings that will be created by the Contractor's removal of the MU-4 carousel end section and the related baggage opening fire-shutter. The existing man-door located between MU-4 and MU-5 will also be removed and wall in-fill closure installed by the Owner. This work will need to be performed directly following the removal of the equipment to maintain the integrity of the fire wall, and the Contractor shall coordinate the work accordingly.

Step 3: The work in Step 3 shall include the installation of MU-4 extension sections to the extent possible without affecting MU-5 operations. This work may overlap the Owner's work in step 2 for wall in-fill closures, however, the Contractor shall coordinate the work and not impede the Owner's work.

<u>Step 4:</u> The work in Step 4 shall be performed with the limits of a **planned maximum of two (2) day duration outage of TC-5/MU-5 operations**. The Contractor shall minimize the length of the equipment outage by working multiple shifts including nightwork, or 24-hrs/day if determined necessary to meet the schedule. The work to be performed during the outage shall include all remaining work necessary to facilitate normal operations of the integrated systems of MU-4 and MU-5. The work includes removal of the fire-shutter and

the end section of_MU-5 and installation of tie-in extensions of MU-4, reconnection of the MU-4 power and controls to TC5-MCP, testing and commissioning of the integrated equipment and controls, and returning the cleaned-up work area over to the Owner for normal operations. The Contractor shall provide a technician onsite to witness equipment performance and make adjustments for the first full day of normal MU-5 operation (up to 10 hrs.) to be scheduled during outbound Airline operations, refer to Section 34 77 39.

The Owner will install the 2-hour fire rated wall in-fill closures for the openings that will be created by the Contractor's removal of the MU-5 carousel end section and the related baggage opening fire-shutter. The Contractor shall plan the work to provide adequate access and duration of the Owner's work once the MU-5 end section is removed and before the MU-4 tie-in extensions are installed which may include the Owner to work off-shift or nightwork.

PHASE-2: TC-2/MU-2 INTEGRATION INTO TC-1/MU-1 ADD-ALTERNATE 1

In this phase the baggage check-in position conveyor for TC-2 will be tied into the TC-1 baggage check-in position conveyor, and the outbound baggage Make-Up (MU-2) carousel will be tied into the MU-1 carousel.

The modifications in this Phase shall be performed in multiple Steps to minimize the duration of service outages for the TC-1 systems at the time of tie-in and re-commissioning.

<u>The Owner (Airport) is currently making the modifications to the baggage check-in</u> position conveyors for the TC-4 to TC-5 interconnection (partial work in Phase 1) utilizing existing drive sections and conveyor sections removed from the TC-2 baggage check-in position conveyor. The remainder of the TC-2 baggage check-in conveyor sections have been removed and stored onsite by the Owner for the Contractor's reuse and installation in this Phase of the project.

The Contract Add-Alternate No.1 Bid price shall include all mechanical, structural frame & anchorage, and electrical power and controls work for the TC-2 baggage check-in position conveyor to the TC-1 baggage check-in position conveyor and the MU-2 carousel interconnection to the MU-1 carousel (Step 1 through Step 4) as shown and noted on the Plans. Variations in the planned construction sequence / steps may be made by the Contractor in the final work plan as necessary based on detailed design and existing conditions verifications provided the contract cost and milestone schedule dates are not affected.

Step 1: The work in Step 1 shall include the installation of new bed sections and tapered roller section to connect the TC-2 conveyor to the TC-1 conveyor which shall be compatible with the existing removed salvaged and stored drive sections, bed sections, end sections, and tapered roller section that shall be reinstalled at TC-2 by the Contractor as part of the work.

The detailed design of the TC-2 system and the installation of the two salvaged drive units shall also include replacement of the existing drive unit motors with larger HP motors as noted on the Plans. The Contractor shall make any required modifications to the drive unit assemblies to accommodate the larger motor.

The re-installation (and modifications if needed) of the existing TC-2 salvaged and stored stainless steel conveyor covers and back guards is also required. Provide and install new stainless-steel covers and back guards for new conveyor sections to match the existing.

The power and controls for the reinstalled TC-2 area conveyors shall be integrated into the TC1-MCP and shall be installed and then initially tested during short-term outage periods

of non-use of TC-1 / MU-1 which may require off-shift or nightwork. The existing TC-1 control station located near the interface of TC-2 and TC-1 shall be modified by adding an extension arm and box to align the pushbuttons with face of the TC-1 conveyor.

The Owner will remove the existing door that will be blocked by the TC-2 extension and will install a wall in-fill closure for the opening. Contractor shall coordinate the work and not impede the Owner's work.

The Owner/others will relocate and/or install new security system connected badge reader pin pads (BRPP) as necessary for the TC-1 baggage conveyor operator station for controlled access (lock-out). The proposed TC-1 controls station extension arm shall be designed to accommodate the BRPP next to the control station. Contractor shall integrate the BRPP into the conveyor controls design connected to TC1-MCP and coordinate the work of all contractors to maintain operations similar to existing conditions.

<u>Step 2</u>: The work in Step 2 shall include removal and relocation of the existing TC-1 conveyor end section and installation of extension to the TC-1 bed section to interconnect with the new tapered roller at the end of the TC-2 conveyor.

Step 3: The work in Step 3 shall include the demolition of the south end section of the MU-2 carousel and modifications to the remaining carousel sections as required to rotate the carousel 90 degrees and prepare for installation of the MU-1 extension sections interconnection to the extent possible without affecting MU-1 operations. Power and control conduit and cable for the relocated MU-2 carousel drive section shall be routed to the extent possible

The Owner will relocate the existing FA Pull Station and lighting control switch and remove the existing man-door at the end of TC-1 and install 2-hour fire rated wall in-fill closure prior to the rotation of the MU-2 carousel sections however, the Contractor shall coordinate the work and not impede the Owner's work.

The Owner will install 2-hour fire rated wall in-fill closures for the openings that will be created by the Contractor's removal of the west side of MU-2 carousel and the related baggage opening fire-shutter. Contractor shall coordinate the work and not impede the Owner's work.

<u>Step 4:</u> The work in Step 4 shall be performed within the limits of a **planned maximum two (2) day duration outage of TC-1/MU-1 operations**. The Contractor shall minimize the length of the equipment outage by working multiple shifts including nightwork, or 24-hrs/day if determined necessary. The work to be performed during the outage shall include all remaining work necessary to facilitate normal operations of the integrated systems of MU-2 and MU-1. The work includes removal of the fire-shutter and the end section of MU-1 and installation of tie-in extensions of MU-2, connection of the MU-2 power and controls to TC1-MCP, testing and commissioning of the integrated equipment and controls, and returning the cleaned-up work area over to the Owner for normal operations. The Contractor shall provide a technician onsite to witness equipment performance and make adjustments for the first full day of normal MU-1 operation (up to 10 hrs.) to be scheduled during outbound Airline operations refer to Section 34 77 39.

The Owner will install 2-hour fire rated wall in-fill closures for the openings that will be created by the Contractor's removal of the MU-1 carousel end section and the related baggage opening fire-shutter. The Contractor shall plan the work to provide adequate access and duration of the Owner's work once the MU-1 end section is removed and before the MU-2 tie-in extensions are installed which may include the Owner to work off-shift or nightwork.

REPLACEMENT OF WEARING PARTS MU-4

In conjunction with Phase-1 scope defined as the Base Bid, this additional work consists of the replacement of all wearing parts including but not limited to bearings, bushings, rollers, wheels etc. (excluding the carousel surface flat plates) for the re-purposed sections of outbound baggage Make-Up (MU-4) carousel that will interconnect with MU-5, as an integral part of the Phase-1 work. The parts replacement shall be integrated into the same overall schedule milestone dates.

REPLACEMENT OF WEARING PARTS MU-2 ADD-ALTERNATE 3

In conjunction with the Phase-2 scope defined as Add-Alternate 1, this additional work consists of the replacement of all wearing parts including but not limited to bearings, bushings, rollers, wheels etc. (excluding the carousel surface flat plates) for the repurposed sections of outbound baggage Make-Up (MU-2) carousel that will interconnect with MU-1 as an integral part of the Phase-2 work. The parts replacement shall be integrated into the same overall schedule milestone dates.

1.04 WORK SEQUENCE AND MILESTONE COMPLETION DATES:

- a. The relative priorities of the work in the various project areas and the resulting milestone completion dates are established by the operational needs of the Airport.
- b. The following work sequence priority and milestone dates shall be incorporated into the Contractor work plan and project schedule:

•	August 4, 2024:	Begin Phase 1 work (Contract Execution) See Figure-1	
		below for anticipated timeline to Phase-1 completion.	
•	October 17, 2024:	Completion of Phase 1 Construction (72 days from	
		Contract Execution).	
•	January 15, 2025:	Begin Phase 2 work.	
•	June 15, 2025:	Completion of Phase 2 work (TC-1 & MU-1 Outages shall not occur during school vacation/holiday weeks)	



Tasks

Start	End	Duration (calendar days)	Label
6/24/2024	7/24/2024	30	Bid Period
7/25/2024	8/1/2024	7	Contract Docs. Preparation - Execution
8/2/2024	8/9/2024	7	Field Verifications *
8/2/2024	8/30/2024	28	Detailed Design & Submittals / Procurement *
8/31/2024	9/28/2024	28	Mob. To site / Demo & Mods to Exist. Components; Step-1*
9/29/2024	10/13/2024	14	Extension Installation; Steps-2-3 *
10/14/2024	10/16/2024	2	Tie-in / MU-5 outage (Step-4) & commissioning
10/17/2024	11/16/2024	30	Submit Phase-1 As-Built Plans & Components Data / Manuals
10/17/2024	10/24/2024	7	Demobilization from site - refer to Phase-2

Approximated Durations of Intermediate Tasks After Contract Execution May Vary or Overlap -but- Latest Phase-1 Completion Date FIXED Milestones

Date	Label			
6/24/2024	Bid Issue			
7/11/2024	Pre-Bid Mtg			
7/24/2024	Bids Due			
8/4/2024	Contract Execution & Start Detailed Design			
8/9/2024	Field Verifications Complete			
10/17/2024	PHASE-1 Construction Completion - 10/17/24			

Figure 1 (anticipated timeline to Phase-1 completion)_

1.05 PROTECTIVE MEASURES

- a. The Contractor shall provide and maintain substantial and adequate protection as may be required to protect new and existing work and all items of equipment and furnishing for the duration of Work. The Contractor shall repair or make good any and all damage or loss he may cause to the building or other Owner property to the full satisfaction of the Owner.
- b. The Contractor shall provide temporary contractor-designed dust / debris containment, and odor ventilation as may be necessary, at or near occupied locations to prevent migration outside of the work areas. The adjacent MU-5 and MU-2 TSA inspection areas and the nearby TC-1 Ticket Counter Airline operations will be active during construction activities except for planned tie-in outages. Sketches and descriptions of temporary containment and protection measures shall be submitted in advance and approved by owner.

1.06 CONTRACTOR MANAGEMENT

- a. The Contractor will provide a superintendent which have previously constructed projects of comparable size and scope. The superintendent shall be on the job-site at all times while Work is in progress, including overtime operations by the Contractor's forces or by subcontractors. The Contractor will provide the names and resumes of the superintendent to the Owner.
- b. The Contractor and superintendent shall not be changed except with the consent of the Owner unless the project manager/superintendent proves to be unsatisfactory to the Contractor or to the Owner or ceases to be in the Contractor's employ. The Owner shall be notified immediately of any pending change of superintendent appointed to the Work and the Contractor shall submit qualifications for approval.
- c. Most work will be in controlled access areas of the airport and Contractor's employees and subcontractors must be badged. Badging at MHT involves filling out an informational form and presenting two forms of gov-issued I.D. (commonly = driver lic. & passport) then fingerprinting for a background check which can take up to one-to-two weeks. Computer-based training (1 to 2 hrs.) at the MHT training room is also required upon successful background check results. Contractor badging process to begin as soon as possible after contract execution and continue during design/mobilization period.
- d. All Contractor personnel onsite to perform on-going work shall obtain a SIDA badge from the Airport. The Owner will not provide any escorts for un-badged contractor or subcontractor personnel. The Contractor will need to provide escorts for any un-badged incidental workers/visitors. All un-badged visitors must obtain a daily Visitor Badge from the Communication Center.

1.07 COORDINATION WITH OTHER CONTRACTORS

- a. Cooperation and coordination between contractors working for the Owner under separate contracts in these areas at the same time on related systems and appurtenances will be required.
- b. Work under other contracts:
 - 1. Access Control Systems Contractor / Security Systems including controlled access door equipment and Conveyor start-up interlock badge reader pin pads (BRPP).
 - 2. Architectural modifications in these areas may be ongoing as part of the Airport Terminal Building Improvements Project .

3. Owner's Maintenance Department and IT Department Work – including supplemental building architectural and building systems modifications.

END OF SECTION 01 01 00

1.01 DESCRIPTION

This Section describes the requirements for the submission of a submittal schedule, shop drawings, product data, samples and other items as specified. Other miscellaneous submittals include, but are not limited to, bonds, warranties, project photographs, quality testing and certifications, record drawings, operating and maintenance manuals.

1.02 SCHEDULE OF SUBMITTALS

- a. The Contractor shall submit a comprehensive and complete Submittal Schedule within (10) calendar days after the notice to proceed.
- b. The schedule shall identify all of the submittal items required by the Contract Documents governing the work.
- c. For each submittal item on the schedule, the following shall be indicated:
 - 1. The specification reference number.
 - 2. A place for a submittal number to be assigned by the Contractor.
 - 3. The date by which that item will be submitted.
 - 4. Whether the submittal is for review or for the record.
 - 5. The date by which the submittal is required to be returned to the Contractor.
 - 6. The date by which the material or equipment must be on the site so as not to delay the progress of the work.
 - 7. Description of the submittal.
 - 8. Name, address, and phone number of subcontractors and suppliers.
- d. In preparing the submittal schedule, the Contractor shall consider the nature and complexity of each submittal item and allow ample time for review, revision, correction, re-submittal, and approval sufficiently in advance of the construction requirements.
 - 1. Allow at least fourteen (14) calendar days for review of each submittal or resubmittal by the Architect / Engineer unless otherwise indicated.
 - 2. Allow at least thirty (30) calendar days for review of complex submittals and resubmittals.
 - 3. No claim for delay will be granted to the Contractor when the delay is caused by failure to make submittals in a timely manner and in accordance with the accepted Submittal Schedule.
 - 4. Allow adequate time beyond the required review time for processing and distribution of each submittal or re-submittal.
- e. The submittals shall be in sequence with the schedule for work except as required for products known to require long lead time. For submittals of items requiring long lead time, submit written verification of the required lead time from the supplier.
- f. The Submittal Schedule shall be considered a part of the Progress Schedule.
- g. At weekly progress meetings, the Contractor shall submit a detailed, updated and accurate schedule of anticipated submittals for the next three week time period for review by the Architect. In addition, a list of those submittals which have been provided since the last weekly meeting, submittals which have been returned since the last weekly meeting, any

submittals which are overdue as compared to the requested return date, and a current list of all submittals and re-submittals shall be submitted.

- h. To the greatest extent possible, the Contractor shall make single submissions covering the entire work of individual Specification Sections. Partial or 'phased' submittals for work of the same Section will not be reviewed unless prior written approval is obtained from the Architect.
- i. Fifteen (15) days after notice to proceed, the Contractor shall provide a listing to the Architect of all administrative submittals required by the Contract, including such items as the Work Plan, CPM schedule, submittal schedule, etc. It will include a description of the item to be provided and the number of days after notice to proceed for submission.
- j. All submittals related to interior finish selections shall be delivered as a single, comprehensive package in order to allow for a simultaneous and comparative review.

1.03 SUBMITTAL TRANSMITTAL FORM AND SUBMITTAL REQUIREMENTS

The Contractor shall include in each transmittal the following information and forward to the Architect an accompanying transmittal.

- a. The number of the submittal.
- b. The date of the submittal.
- c. The Contractor's name.
- d. The subcontractor's name.
- e. The Project name.
- f. The Project number.
- g. The Specification Section and paragraph.
- h. The Drawing reference.
- i. On the transmittal record, note the date sent and the requested due date from the Architect.
- j. Note the quantity and type of submittal.
- k. Note the Drawing/item, date, and description of the submittal.
- 1. Note any deviations from the Contract Documents.
- m. The Contractor's certification review of the submittal and compliance with the requirements of the Contract Documents.
- n. Field dimensions identified as such.
- o. Any other pertinent information.
- p. All attachments to the transmittal record will be identified with the submittal number.

1.04 SUBMITTAL NUMBERING SYSTEM

Submittals shall be numbered sequentially by Specification Section. Re-submittals shall be followed by "-1", "-2", "-3" etc. as necessary for each resubmission. For example, the first submittal regarding Section 09 90 00 shall be "09 90 00-001". The second submittal in that Section shall be 09 90 00-002". The first resubmittal of 09 90 00-002" shall be 09 90 00-002-01."

1.05 CONTRACTOR'S RESPONSIBILITIES

a. The Contractor shall maintain a log of submittals showing the submittal number, description, specification section, schedule submittal date, date to the Architect, requested due date, date received from Architect, submittal review action code, and comments. The Contractor shall submit a current copy of the submittal log each month.

- b. The following information shall be included, where applicable:
 - 1. Field measurements.
 - 2. Field construction criteria.
 - 3. Catalog numbers and similar data.
 - 4. Relation to adjacent structure or materials.
 - 5. Field dimensions, clearly identified as such.
 - 6. Applicable standards, such as ASTM numbers.
 - 7. A 4" x 4" blank space for the Architect's stamp.
 - 8. Notes identifying deviations from the Contract documents.
 - 9. "Clouds" on re-submittals showing revised areas.
- c. The Contractor shall submit drawings and samples in accordance with the approved schedule of submittal dates.
- d. The Architect shall be notified in writing, at the time of submission, of deviations in submittals from the requirements of the Contract Documents. The Contractor's responsibility for deviations in submittals shall not be relieved by the Architect's review of the submittals, unless the Architect gives written acceptance of specific deviations. No changes shall be made without an approved Change Order.
- e. The Contractor shall indicate by signed stamp that the submittal has been thoroughly checked and that it is in strict accordance with the Contract requirements.
- f. The Contractor's responsibility for errors and omissions in the submittals shall not be relieved by the Architect's review.
- g. The Contractor shall be responsible for the accuracy of the submittals and for the proper fitting, verification of dimension, verification of quantities, construction of the work, furnishing of materials, and work required by the Contract Documents but not indicated on the submittals.
- h. Submission of shop drawings, calculations, product data, etc. in either original submission or when resubmitted with corrections, constitutes evidence that the Contractor has checked all information thereon, and that he/she accepts and is willing to perform the work as shown, in a workmanlike manner, and in accordance with the best standard practice.
- i. The Contractor shall not submit drawings, samples, or data for products that have not been specified unless such products have been formally approved as a substitute. (Section 01 60 01 Product Options & Substitutions)
- j. No work which requires submittals shall begin until such submittals have been reviewed by the Architect and returned to the Contractor.
- k. The Contractor shall notify the Architect immediately if he/she considers any comments, notations, instructions, notes, etc. applied to the submittals by the Architect to be a change to the Contract requirements. The Contractor shall initiate an RFI (Request for Information) identifying the scope of the work which they consider to be a change to the Contract requirements. The RFI will be submitted in accordance with the IR processing requirements contained within the Specification.
- 1. The Contractor shall perform no portion of the work requiring submittal until such submittal is made to the Architect and the review process is completed.

1.06 ARCHITECT'S RESPONSIBILITIES

- a. The Architect will review submittals with reasonable promptness as defined below for design concept and compliance with the Contract Documents.
- b. The Architect's review of the shop drawings will be for general conformance with design conditions only and will not relieve the Contractor of his/her responsibility for quantity, fit, dimensions, coordination and full compliance with all of the Contract documents.
- c. The Architect reserves the right to reject submittals which, in its opinion, are incomplete and/or lack sufficient information to enable them to accomplish a thorough review.
- d. The Architect may reject re-submittals which do not clearly indicate where revisions have been made to the original submittal.
- e. The Architect will reject submittals for product which have not been specified unless such products have been formally approved as acceptable substitutes. (Section 01 60 01 Product Options & Substitutions).
- f. The Architect's review of the submittals shall not be construed as approving departures from the Contract requirements.
- g. The Architect's review of the submittals shall not relieve the Contractor from responsibility for any violation, indicated on such submittals, of local, City, State, or Federal laws, rules, ordinances, or rules and regulations of commissions, boards, or other authorities or public utilities having jurisdiction.
- h. The Architect's review of separate items does not constitute review of an assembly in which the item functions.

1.07 RESUBMISSION REQUIREMENTS

- a. Shop drawings:
 - 1. The Contractor shall revise initial shop drawings as required.
 - 2. Areas of the revision shall be indicated by drawing a "cloud" around the revised areas and identify revisions by a revision number and date. The Architect's review of a resubmission shall not constitute acceptance of any changes not specifically requested on the prior submission.
- b. Product data and samples:
 - 1. New data and samples shall be submitted as required for initial submittal.

1.08 DISTRIBUTION OF SUBMITTALS AFTER REVIEW

- a. The Contractor shall distribute copies of submittals which carry the Architect's stamp to:
 - 1. The Contractor's project site file and the project record file.
 - 2. Subcontractors as appropriate.
 - 3. Others as appropriate.

END OF SECTION 01 30 00

SECTION 01 30 05 - PROJECT COORDINATION

1.01 CONTRACTOR'S RESPONSIBILITIES

The Contractor's project coordination responsibilities include, but may not be limited to, the following. The Contractor shall:

- a. Coordinate the work of all subcontractors and provide copies of coordination schedules as requested by the Architect.
- b. Establish lines of authority and communication; supply the Owner with list a list of 24 hr. emergency contact numbers of all supervisors and subcontractor supervisors.
- c. Include in the scheduled weekly meetings, the coordination of various entities and activities. Where necessary, schedule additional coordination meetings for the purpose of coordinating the work, daily security issues, and resolving conflicts,
- d. Provide all subcontractors with reasonable opportunity for the introduction and storage of their materials and equipment and the execution of their work.
- e. Make provisions to accommodate items installed by the Owner or by others under separate contracts and/or controls.
- f. Prepare, utilize and submit for information, coordination drawings to indicate how work shown by separate shop drawings will be interfaced and sequenced for installation.
- g. Establish and maintain procedures to ensure that persons performing work at site are skilled in methods and craftsmanship needed to produce required quality-levels. Remove and replace (at no additional cost to the Owner) work which does not comply with workmanship standards as specified and as recognized in the construction industry for applications indicated.
- h. In advance of installation of every major unit of work which requires coordination and interfacing with other work, meet at project site with installers and representatives of manufacturers and fabricators who are involved in or affected by unit of work. Review progress of other work and preparations for particular work under consideration.
- i. Require installer of each major unit of work to inspect substrate to receive work, and conditions under which work will be performed, and to report (in writing to Contractor) unsatisfactory conditions. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to installer.
- j. Where installation includes manufactured products, comply with manufacturer's instructions and recommendations, to extent these are more explicit or more stringent than requirements indicated in contract documents.
- k. Inspect each item of materials or equipment immediately prior to installation and reject damaged and defective items.
- 1. Provide proper and structurally sound connection devices and methods for securing work as it is installed; true to line and level, and within recognized industry tolerances if not otherwise indicated. Allow for expansion and building movements. Provide uniform joint widths in exposed work. Refer appearance choices to Architect for final decision,
- m. As an integral step of starting each installation, recheck measurements of the Work.

- n. Install work during conditions of temperature, humidity, exposure, weather, and status of project which will ensure satisfactory results. Coordinate with entire work. Isolate each unit of work from non-compatible work, as required to prevent rust, electrolysis, and deterioration or any kind due to incompatibility of materials. Where units of work touch, use only materials proven to be compatible.
- o. Coordinate closing-in of work with required inspections and tests, so as to minimize uncovering work.
- p. Where mounting heights are not indicated, refer to Architect for final decision. Submit manufacturer's recommendations.
- q. Coordinate the tolerances of all materials.
- r. Coordinate with the other Contractors.
- s. Require training for subcontractor field supervision personnel for Airport operations and security.

1.02 MUTUAL RESPONSIBILITY

If any part of the Contractor's Work depends for proper-execution or results upon the work of the Owner or any separate contractor, the Contractor shall, prior to proceeding with the Work, inspect and promptly report to the Owner any apparent discrepancies or defects in such other work that render it unsuitable for such proper execution and results.

Failure of the Contractor to so inspect and report shall constitute acceptance of the work of others as fit and proper to receive the work, except as to defects which may subsequently become apparent in such work by others.

Any costs caused by defective or ill-timed work shall be borne by the responsible party to whom the Architect attributes the cause of the defect(s).

Should the Contractor wrongfully cause damage to the work or property of others or to other work or property on the site, the Contractor shall promptly remedy such damage.

1.03 NOTICE AND UTILITY SERVICES

If the Contractor is to tie into existing utilities either in the form of a temporary tie-in or permanent tie-in, the Contractor shall make arrangements with the utility companies and local authorities at no expense to the Owner. Also, if the Contractor damages any existing utilities with his equipment and/or manpower, he shall arrange with the utility company to repair the damaged utilities to their original condition at his expense.

Where such tie-in requires utility shut down, the Contractor must notify the Owner in writing, 7 days in advance of such shut down.

1.04 OVERTIME AND HOLIDAY WORK

Overtime, multiple shift, weekend and holiday work may be required to complete the work within the allotted time of this Contract. If it becomes necessary to perform any work after regular working hours, on Saturdays, Sundays, or legal holidays in order to bring the Contractor's work into conformance with the Schedule due to delays for which the Contractor is responsible, the overtime, weekend, or holiday work shall be performed by the Contractor at no additional cost to the Owner.

1.05 COORDINATION WITH OWNER PERSONNEL

The Contractor shall coordinate and cooperate with Owner personnel throughout the Project as they visit the site.

END OF SECTION 01 30 05

1.01 SHOP DRAWINGS

- a. Submit to the Architect an electronic PDF markable file of submittals. For large shop drawings, not to exceed 30" x 42", submit one reproducible copy.
- b. Each shop drawing shall have blank spaces large enough to accept 4" x 4" review stamps of the Contractor, Architect and/or Engineer.
- c. Shop drawings shall include plans, sections, and details including complete information for making connections with other work and any other information necessary to adequately describe the unit of work.
- d. Materials and finishes shall be clearly identified and, where applicable, Specification Sections and paragraph numbers shall be included as reference.
- e. Identify details by reference to sheet and detail numbers shown on the Contract Documents.
- f. Identify applicable standards, such as ASTM numbers, Federal or State Specification numbers on the drawings.
- g. Identify deviations from the Contract Documents.

1.02 PRODUCT DATA

- a. Submit an electronic PDF markable file of manufacturer's catalog cuts, brochures, diagrams, schedules, performance charts, illustrations, and other descriptive data as required by the Specification Sections. When manufacturer's printed literature is required to be submitted it shall be submitted in original form. Make one coordinated submittal for each unit of work of system. An electronic copy shall be returned to the Contractor.
- b. Mark the manufacturer's data to clearly indicate the items to be included as a part of the work. Product data submitted with multiple items and no clear indication as to which item is to be used in the work will be returned to the Contractor without being reviewed.
- c. Submit manufacturer's standard printed recommendations for application and use. Supplement standard information to provide additional information applicable to the Project.
- d. Include dimensions and clearances required. Indicate field dimensions which have been checked and verified.
- e. Show performance characteristics and capacities; wiring diagrams and controls.
- f. Review product data prior to submission to the Architect. Stamp and sign each submittal to indicate that the Contractor has reviewed the submittal for compliance with the Contract Documents.

1.03 SAMPLES

a. The purpose of sample installations shall be to clearly establish standards of quality for the project prior to proceeding with the work. The Contractor shall construct, prepare, or otherwise provide samples/sample installations as directed by the Architect. All costs related to providing, maintaining and removing required samples shall be paid by the Contractor.

- b. Submit four (4) samples as specified. Unless otherwise specified, samples shall be of sufficient size and quantity to clearly indicate:
 - 1. Functional characteristics of the product or material, with integrally related parts and attachment devices.
 - 2. Full range of color samples.
- c. Requirements for field samples and mockups:
 - 1. Erect at site in locations acceptable to the Architect.
 - 2. Construct each mockup or field sample; include all items required in the finish work.
 - 3. Mockups or field samples shall remain in place until the work it represents has been completed and accepted by the Architect.
- d. Label each sample to indicate the name of the Project, Contractor, manufacturer, brand.
- e. Provide units identical with final condition of proposed materials or products for the work. Include "range" samples (not less than three units) where unavoidable variations may be expected, and describe or identify the variations between units of each set. Provide full set of optional samples where Architect's selection is required.
- f. Prepare samples to match the Architect's samples where so indicated. Include information with each sample to show generic description, source or product name and manufacturer, limitations, and compliances with standards. Submit samples for the Architect's review and conformation of color, pattern, and texture.
- g. After a sample has been accepted, no change in brand or manufacturer will be permitted unless satisfactory written evidence is presented to, and accepted by the Architect, that the manufacturer cannot make scheduled delivery of the accepted material, or that the material delivered has been rejected and substitution of suitable material is an urgent necessity.
- h. Maintain returned final set of samples at project site, properly protected and in suitable condition and available for quality control comparisons by the Architect and others. Quality control set shall serve as the basis for comparison for following work, and shall establish the standard of color, pattern, texture, workmanship, and other qualities as applicable.
- i. Returned samples which are intended or permitted to be incorporated in the work are so indicated in individual sections, but must be undamaged at the time of use.
- j. Where colors are specified or described by the Architect to match a manufacturer's standard paint color number, secure sample color chips of sufficient size from the manufacturer and prepare matching samples for review by the Architect.

END OF SECTION 01 30 10

SECTION 01 30 20 - PROJECT ADMINISTRATION

1.01 DESCRIPTION

- a. The Work on this Project will be subject to inspection by Owner's representative. No inspector, superintendent, or administrator is authorized to change any provisions of the Specifications without written authorization of the Architect, nor shall the presence or absence of the inspector relieve the Contractor from any requirements of the Contact.
- b. The Contractor shall adhere to the following procedures which include, but are not limited to, the following:
 - 1. Prepare a daily construction report, recording the following information concerning events at the site; and submit copies to the Architect and Owner at weekly intervals:
 - a) List of Subcontractors at the site.
 - b) Approximate count of personnel at the site.
 - c) Accidents and unusual events.
 - d) Meetings and significant decisions.
 - e) Stoppages, delays, shortages, losses, etc.
 - f) Meter readings and similar recordings.
 - g) General weather conditions, high & low temperatures.
 - h) Emergency procedures.
 - i) Orders and requests of governing authorities.
 - j) Change Orders received, implemented.
 - k) Services connected, disconnected.
 - 1) Equipment or system tests and start-ups.
 - m) Partial Completions, occupancies.
 - n) Substantial Completions authorized.
 - 2. Be responsible for the quality of the work performed and take primary responsibility and authority for quality control in accordance with these specifications.
 - 3. Provide written advance notice to the Owner at least 3 working days prior to the start of work which requires testing as required by governing authorities and/or by these specifications.
 - 4. Follow the field instructions issued by the Architect / Engineer.
 - 5. Prepare and submit Cost Proposals, review with the Architect and submit final proposed Change Order Requests in accordance with the procedures established in the Specifications.
 - 6. Submit Applications for Payment as required. Submit claims in accordance with established procedures as outlined in the General and General Supplemental Conditions.
 - 7. Coordinate the closeout of the Project. Follow the procedures for closeout as established in the Specifications.
 - 8. Comply with the Architect's notices of noncompliance and utilize the notice of noncompliance form to notify when and how the work is in compliance.

9. Have subcontractors attend project meetings as requested by the Architect.

END OF SECTION 01 30 20

SECTION 01 30 25 - CLARIFICATION & INSTRUCTION

1.01 DESCRIPTION

Should the Contractor discover conflicts, omissions, or errors in the Contract Documents, or have any question concerning interpretation of the Contract Documents; or if it appears to the Contractor that the work to be done is not sufficiently detailed or explained in the Contract Documents, the Contractor shall immediately notify the Architect in writing with a Request for Information (RFI), for interpretation or additional detailed instructions concerning the Work.

In event of failure to agree as to scope of Contract requirements, Contractor shall follow procedure set forth in Section 00 85 00 – DISPUTES-CLAIMS.

If the Contractor considers a clarification to be a change, he must submit a cost proposal request within ten (10) calendar days following receipt of instruction or waive his right to the change.

a. Clarification:

The Contractor shall ask for any clarification immediately upon discovery of an issue as outlined under Section A. The Contractor shall submit all requests for clarification and/or additional information to the Architect in writing on a Request for Information form. Subcontractor requests for information or clarification must be made through the Contractor. The Architect, whose decision shall be final and conclusive, shall resolve such questions and issue instructions to Contractor within a reasonable amount of time but in no more than fourteen (14) calendar days. Only responses written and signed by the Architect are binding. Should the Contractor proceed with work affected before receipt of instructions from the Architect, the Contractor shall remove and replace or adjust work which is not in accordance therewith and shall be responsible for resultant damage, defect or added cost.

b. Supplemental Instructions:

The Architect may furnish additional detailed written instructions to further explain the Work, and such instructions shall be a part of the Contract requirements. Should additional detailed instructions, in the opinion of Contractor, constitute work in excess of scope of the Contract, he must submit written notice thereof immediately to the Architect but not more than seven (7) calendar days following receipt of such instruction, and in any event prior to commencement of work thereon. The Architect will then consider such notice and, if the judgment is justified, the Architect's instructions will be revised or the extra work authorized. The Contractor shall have no claim for additional compensation because of such additional instructions unless Contractor gives the Architect written notice thereof within the seven (7) days specified above.

c. Field Reports:

A field report issued by the Architect will be used to document items of Work performed incorrectly or omitted by the Contractor that are non-conforming to Contract Documents.

- 1. All field reports shall be provided to the Contractor and Owner in writing.
- 2. The Contractor will be directed to advise the Architect of impacts on the schedule as a result of any field report.
- 3. All field reports shall be discussed at project meetings.
- 4. Field reports shall not be closed until a corrective action plan, prepared by the Contractor, is accepted by the Architect.

END OF SECTION 01 30 25
SECTION 01 30 26 - CHANGE ORDER PROCEDURES

1.01 CHANGES

There will be no changes to the Contract except as by written notification in the form of an approved change order issued by the Architect and signed by the Owner and Contractor.

Should the Architect or Owner at any time during the progress of the Work, request any extra work including but not necessarily limited to alterations, deviations, additions, or omissions from the Contract Documents, it shall be at liberty to do so. Changes may include but may not be limited to:

- a. Scope or materials.
- b. Facilities, equipment, materials, services, or site by others.
- c. Directing acceleration in the performance of the Work.
- d. Extra terms or time.

1.02 CHANGE ORDER WORK NOTIFICATION

If any change causes an increase or decrease in the Contractor's cost of, or the time required for, the performance of any part of the Work under this Contract, whether or not changed by any such order, the Architect will make an equitable adjustment and modify the Contract in writing as a Change Order, signed by the Owner and Contractor.

No proposal by the Contractor for an equitable adjustment shall be allowed if asserted after final payment under this Contract.

Changes will be performed in accordance with the original Contract requirements unless otherwise indicated.

1.03 CHANGE ORDER PROCESS

- a. Where the Architect and Owner concur that a change is due or requests a change, a Proposal Request (PR) will be issued. Proposal requests issued by the Architect are for information only. Do not consider them as instruction either to stop work in progress, or to execute the proposed change. This information will be issued by means of a numbered Proposal Request.
- b. Upon receipt of the Proposal Request, the Contractor shall submit a cost proposal, in accordance with the requirements and limitations set forth below, for work involving contemplated changes covered by the proposed change. The Contractor's written proposal for an equitable adjustment for a change shall be submitted in the following form:
 - 1. The proposal shall include a lump sum amount supported by a detailed itemized breakdown of all increases and decreases in the Contract, including all labor, equipment and materials, as required by the following paragraphs. The Contractor will use a cost proposal form acceptable to the Architect and Owner. The Contractor shall upon request by the Architect permit inspection of the original unaltered contract bid estimate, subcontract agreements, or purchase orders relating to the change; and documents substantiating all costs associated with the Cost Proposal.

- 2. The Contractor shall identify any adjustment in time of the final completion of the Work as a whole which is directly attributable to the changed work. The Contractor's request for a change in time will be supported by a detailed schedule analysis indicating the activities which have been affected and the additional time being requested. For a change in time for the Work, the Contractor shall be entitled only to such adjustments in time by which completion of the entire Work is delayed due to the performance of the changed work. Failure to request extra time when submitting such estimate shall constitute waiver of the right to subsequently claim adjustment in time for final completion based upon such changed work.
- 3. If the Architect disagrees with the request for change it will notify the Contractor in writing and the Contractor may elect to issue a dispute notification according to the disputes clause.
- 4. The Contractor must submit the cost proposal within ten (10) days upon receipt of the proposal request. The Contractor shall submit cost proposals in less than 10 days if requested by the Architect or as required by schedule limitations.
- c. If the Contractor fails to submit the cost proposal within the 10-day period (or as requested), the Architect has the right to order the Contractor in writing to commence the work immediately on a force account basis and/or issue a lump sum change to the Contract price in accordance with the Architect's estimate of cost. If the change is issued based on the Architect's estimate, the Contractor will waive his right to dispute the action unless within 10 days following completion of the added/deleted work, the Contractor presents proof that the Architect's estimate was in error.
- d. If the Architect and the Contractor fail to agree as to the proposed change order, the Contractor upon written order from the Architect shall proceed immediately with the changed work. This written notice will be issued as a Construction Change Directive (CCD). The Contractor shall be directed to proceed according to one or more of the following methods:
 - 1. Unit Prices, as provided in the Contract proposal.
 - 2. Unit Prices, as subsequently and mutually agreed upon by the Owner and the Contractor.
 - 3. Lump Sum Amount, mutually agreed upon by the Owner and the Contractor.
 - 4. Time and Material, on a time and materials (T&M) (force account) basis.

When there has been failure to agree as to the cost, no payment will be made to the Contractor until completion of the Work called for in the change order or in the written order authorizing performance of the work.

- e. The Architect will establish a budget not-to-exceed (NTE) price for the T&M change order which may be increased with the approval of the Owner. The Contractor will notify the Architect when he has reached 80% of the not-to-exceed budget. The Contractor shall proceed and shall maintain a daily job force account record containing detailed cost summary of labor, materials, and equipment required for the changed work. Upon being signed and agreed to by the Owner on a daily basis, the force account record will become the basis for payment of the changed work, but such agreement shall not preclude subsequent adjustment based upon later audit by the Owner. The Contractor will provide a weekly accounting of cost compared to the NTE budget.
- f. Upon completion of the work under the T&M change order, the Contractor shall submit its invoice therefore containing only the items of labor, materials, and equipment which are in

addition to the requirements of the contract and as approved by both parties, together with the allowable markups.

- g. A change order may adjust the Contract price either upward or downward in accordance with one or a combination of the following bases as the Owner may elect:
 - 1. On a lump sum basis as supported by the breakdown of estimated costs.
 - 2. On a unit price basis.
 - 3. On a time and material (force account) basis.
- h. Costs associated with change orders include:
 - 1. Overhead Rates
 - a) The overhead rate shall include profit, small tools, cleanup, bonds, engineering, supervision, warranties, job-site overhead and home office overhead.
 - b) The Contractor will provide at the beginning of the Project a certified statement and detailed calculation from its accountant establishing the job site and prorate home office overhead rates for itself and its major subcontractors. The overhead and profit shall be against labor and materials only. Where Work is subcontracted, no mark up will be allowed on overhead or profit of others including second and third layer subcontractors or material suppliers. In no case shall the total accumulated overhead and profit on any change order work exceed 15% on a lump sum or unit price basis and 10% on a time and materials basis. In a credit situation the Contractor will utilize the same overhead and profit rates against labor and materials in preparing the change order.
 - c) The Owner shall have the right to review and approve the overhead rate. Where the Contractor and Owner fail to come to an agreement for Contractor's overhead rate, the Owner shall set such rate based in current industry and the Contractor shall be entitled to dispute the action if he does so within 15 days following notice.
 - d) The Contractor at the beginning of the project shall provide a complete listing of all Contractor and subcontractor hourly labor rates.
 - 2. Direct Costs
 - a) Cost for labor shall include any employer payments to or on behalf of the workmen for health, welfare, pension, vacation, and similar purposes. Labor rates will not be recognized when in excess of those prevailing in the locality and time the work is being performed. The costs for all supervision including General Superintendents and Foremen will be included in the markups established by the Contract. The only exception to this will be working foremen who perform actual manual labor. No labor charges will be accepted for engineering or proposal preparation. These costs will be included in the markups established by the Contract. A breakdown of the payroll rates for each trade will be provided for all change orders 15 days after notice to proceed including the base rate, benefits, payroll taxes, and insurance.

Overtime and premium time pricing will only be allowed for labor which, based on mutual agreement, shall be performed after normal working hours.

b) The actual cost to the Contractor for the materials directly required for the performance of the changed Work. Such cost of materials may include the cost of transportation and no delivery charges will be allowed unless the delivery is specifically for the changed Work

If a trade discount by an actual supplier is available to the Contractor, it shall be credited to the Owner. If the materials are obtained from a supplier or source owned wholly by or in part by the Contractor, payment thereof will not exceed the current wholesale price for the materials. The term 'trade discount' includes the concept of cash discounting.

If in the opinion of the Architect, the cost of the materials is excessive or if the Contractor fails to furnish satisfactory evidence of a cost to him from the actual supplier thereof, then, in either case, the cost of the materials shall be deemed to be the lowest current wholesale price at which similar materials are available in the quantities required. The Owner reserves the right to furnish such materials as it deems advisable, and the Contractor shall have no claims for cost or profits on materials furnished by the Owner.

c) The actual cost to the Contractor for the use of equipment directly required in the performance of the changed work. In computing the hourly rental of equipment, any time less than 30 minutes shall be considered one-half hour. No payment will be made for time while equipment is inoperative due to breakdown or for non-workdays. In addition, the rental time shall not include the time required to move the equipment to the work for rental of such equipment, and to return it to the source. No mobilization or demobilization will be allowed for equipment already on site. If such equipment is not moved by its own power, then loading and transportation costs will be paid in lieu or rental time thereof. However, neither moving time nor loading and transportation costs will be paid if the equipment is used on the project in any other way than upon the changed work.

Individual pieces of equipment having a replacement value of \$1,000 or less shall be considered to be small tools or small equipment and no payment will be made therefore.

The rental rate for equipment will not exceed that as recommended by the lower of the rental rates as contained in the current edition of the Rental Rate Blue Book applicable to the specific extra work or force account work.

For equipment owned, furnished, or rented by the Contractor no cost thereof shall be recognized in excess of the rates established by the Rental Rate Blue Book.

The amount to be paid to the Contractor for the use of equipment as set forth above shall constitute full compensation to the Contractor for the cost of fuel, power, oil, lubricants, supplies, small tools, small equipment necessary attachments, repairs and maintenance of any kind, depreciation, storage, insurance, labor (except for equipment operators) and any and all costs to the Contractor incidental to the use of the equipment.

- i. The Contractor shall maintain his records in such a manner as to provide a clear distinction between the direct costs of extra work and the cost of other operations. This requirement pertains to proposed change orders change orders and work the Contractor considers to be potential change orders.
- j. Changes in the Work made necessary due to unexpected or unforeseen site conditions, discovery of errors or omissions in plans or specifications requiring immediate clarifications in order to avoid serious work stoppage, or other changes where the extent cannot be determined until completed, or under any circumstances whatsoever deemed necessary by the Architect, are types of emergency changes which may be authorized by the Architect in writing to the Contractor. The Contractor shall commence performance of emergency changes immediately upon authorization. These changes will be performed on a time and material (force account) basis as aforementioned.
- k. The Contractor may not reserve a right to assess impact cost or time, extended job site costs, extended overhead, and/or constructive acceleration at some later date as related to any and all changes. These costs or estimated costs must be supported with full schedule and cost documentation with each proposed change within the prescribed submission times. If a request for a change is denied and the Contractor disputes the denial, the Contractor must supply the aforementioned documentation to support his claim under the dispute clause of this contract The Contractor shall waive his right to impact, extended overhead costs and construction acceleration due to the multiplicity of changes and clarifications.
- 1. Contractor and subcontractors by submission of a bid acknowledges and waives the right to claim extended overhead, delay, impact, disruption, etc. if changes issued are within 5 percent of the award amount and/or the number of Requests for Information (RFIs) is less than 2,000.
- m. If the changes exceed 10 percent of the contract and/or RFIs exceed 2,000 in number, the Contractor must demonstrate on a case-by-case basis the effect on the Contract as a whole with detailed schedule and cost analysis.
- n. Should the Contractor find that a change has not been processed which may affect the immediate controlling activity(s), he shall request a Construction Change Directive (CCD) to proceed on a T&M basis.

END OF SECTION 01 30 26

SECTION 01 30 27 - CONTRACTOR'S WORK PLAN

1.01 DESCRIPTION

This Section describes the requirements for finishing a work plan describing Contractor's approach and methods for prosecuting the Work.

It is expressly agreed that time is of the essence of this Contract, and the Contractor agrees to perform the Work within the time and in the manner specified, or within the time of such extensions as may be granted.

The Contractor's scheduling of work crews, equipment and materials will be of utmost importance for completing the work within the time allowed. The Contractor may be required to employ one or more of the following measures to build the project within the time constraints:

- a. Utilize extra equipment and manpower.
- b. Work more than the normal 8-hour shift per day, 5-day week. Overtime, two or three 8-hour shifts per day, 6 or 7 days per week may be required.
- c. Employ extra staff to plan, schedule, coordinate and expedite the work.

In addition to employing additional resources as described above, the Contractor will be expected to take whatever additional steps are necessary to ensure timely completion of the Project.

Submission of a bid by the Contractor constitutes acknowledgment that the foregoing requirements have been taken into account in the Contractor's bid price.

1.02 CONTRACTOR'S WORK PLAN

<u>Ten working days after</u> notice to proceed, the lowest responsive, responsible bidder is required to submit a Work Plan describing in detail the Contractor's approach and methods for prosecuting the Work in accordance with the construction and time constraints. The Work Plan shall include but not be limited to the following:

- A summary schedule of the Work with milestone completion dates clearly indicated. The schedule shall show the major critical path trades and their respective activity constraints. As a minimum, the Contractor shall show the activities for concrete, miscellaneous steel, doors, finishes, mechanical and electrical systems.
- b. A narrative and schedule describing how the Contractor intends to staff, equip and supply the job by trade in order to meet contractual time constraints. Include number of crews, crew sizes, total workers for each phase, activity, number and types of major equipment to be used, method of material procurement, hours per work shift, work shifts per day, anticipated production rates, etc. Production rates shall be provided for at least the concrete, miscellaneous steel, doors, mechanical and electrical systems, interior finishes.
- c. A breakdown by Specification Section, of the work Contractor, subcontractor, or major supplier is responsible to complete.
- d. An organization chart describing: (a) the hierarchy and relationships of the Contractor's project management staff and the hierarchy of subcontractors and suppliers including the trade(s) or portion(s) of work for which each is responsible. Of particular interest is how the Contractor intends organize and coordinate off-site work that involved the combined effort of subcontractors and suppliers.

- e. A description of what additional methods will be used by the Contractor, should actual progress of the Work not meet the time constraints specified herein, as defined in Section 01 30 28.
- f. A directory of the Contractor and all subcontractors including 24-hour emergency telephone numbers.

The Architect and Owner will review the Contractor's Work Plan for reasonableness and for conformance with Contract requirements. If the Work Plan does not meet specific Contract requirements or if, in the Architect's opinion, the Work Plan does not give a reasonable assurance of the Contractor's commitment to timely completion, the Architect will notify the Contractor of the deficiencies or his concerns with the Work Plan. Preconditions for payment shall be that the Contractor responds satisfactorily to the Architect's concerns. A completed and approved construction schedule is required prior to a submission of an Application For Payment.

END OF SECTION 01 30 27

1.01 DESCRIPTION

- a. The Contractor shall prepare, maintain and update detailed progress schedules. The schedules shall be a true and accurate representation of the Contract's Work Plan and shall accurately reflect and report the actual performance and progress of the Work.
- b. The Contractor's attention is specifically directed to the fact that submission and approval of Interim and Contract CPM Progress Schedules as well as CPM Progress Schedule updates, are required in order for the Architect to certify the approximate amount of work performed and compensation earned by the Contractor. (Section 00 76 50 Measurement and Payment)

1.02 REQUIREMENTS

- a. The Contractor shall submit a complete computer-generated project CPM Project Schedule. This *Baseline* Schedule shall reflect the Contractor's projected plan and schedule to compete all work within Contract time specified.
- b. Schedule submittals are subject to review and acceptance by the Architect. The Owner retains the right to withhold progress payments until the Contractor submits a Progress Schedule acceptable to the Owner.
- c. The Contractor shall submit monthly progress review and update of the schedule as basis of each progress payment.
- d. A computer scheduling system shall be utilized for producing CPM Progress Schedule drawings and network reports. The preferred scheduling software shall be MS Project Primavera or equal compatible, and approved, software.
- e. Where system testing is required in no case shall more than 90-percent of the value be paid prior to the system passing all applicable tests.
- f. Mobilization activities shall include any costs necessary for the Contractor to set-up operations on-site, including but not be limited to: bonds, permits, field office, utilities, equipment, insurance, and storage trailers.
- g. At the head of the schedule, provide a two item cost correlation line indicating "Pre calculated" and "Actual" costs. On the line, show dollar - volume of work performed as of the dates used for preparation of payment applications.

1.03 PREPARATION GUIDELINES

- a. The Progress Schedule shall represent a practical plan to complete the work within the Contract time for completion. The Progress Schedule shall be consistent in every way with the Contractor's Work Plan submitted previously.
 - 1. A schedule extending beyond the Contract time will not be acceptable.
 - 2. A schedule showing the Work completed in less than the Contract time may be found by the Architect to be impractical.
 - 3. A schedule found to be impractical for the preceding reason or any other reason shall be revised by the Contractor and resubmitted.

- 4. A schedule showing the Work completed in less than the Contract time, which is found to be practical by the Architect, shall be considered to have float. The float is the time between the scheduled completion of the work and Contract completion date. Float is a resource available to both the Owner and the Contractor.
- 5. Approval of the Contractor's schedule if based on less time than the maximum time allowed does not serve to change the specified time of completion, nor serve as a waiver of the Contractor's nor the Owner's right to the full amount of time specified as the time of completion, unless the time of completion is changed by a formal change order to this Contract.
- 6. Not less than 20-calendar days will be established prior to completion for punch list completion and cleanup.
- 7. No more than 15-percent of the activities shall be critical or near critical. Near critical is defined as float in the range of 1 to 10 workdays.
- 8. No activity shall have duration greater than 15 days.
- b. The Progress Schedule shall clearly show the sequence and interdependence of construction activities and shall specifically as a minimum indicate:
 - 1. The start and completion of all items of work, their major components, and interim milestone completion dates, if any.
 - 2. Activities for procurement, delivery, installation and completion of each major piece of equipment, materials, and other supplies, including:
 - a) Time for submittals, resubmittals, and reviews.
 - b) Time for fabrication and delivery of manufactured products for the Work.
 - c) The interdependence of procurement and construction activities.
 - 3. Items related to action by others (Owner, regulatory agencies, other contractors) that may cause interference or be required to be completed by other before Work can start or finish.
- c. The schedule shall:
 - 1. Be in sufficient detail to assure adequate planning and execution of the Work. Activities should generally range in duration from 3- to 15-work days each. Except for procurement items which shall have a duration which starts with approval of shop drawings and ends with delivery to construction site.
 - 2. Be suitable, in the judgment of the Architect, to allow monitoring and evaluation of progress in the performance of the Work.
 - 3. Show detailed subcontractor work activities. The Contractor will provide a schedule for all subcontractor/ Contractor CPM schedule meetings which are to be held prior to the submission of the CPM schedule to the Owner. The Architect and Owner shall be allowed to attend the scheduled sessions as an observer. In addition to the Contractor / subcontractor meetings, the Architect may require Contractor and subcontractors to attend scheduled development meetings to ascertain information for approval of the CPM schedule.
 - 4. Be calendar time-scaled in the form of an activities-on-arrow network diagram:

- a) The activities shall include:
 - (1) Description; what is to be accomplished and where.
 - (2) Calendar day duration.
 - (3) Responsibility code; identifiers who performs the activity. One per activity.
- b) The network shall show continuous flow from left to right.
- 5. Identify days per week and hours/shifts per day that Contractor intends to work.
- 6. Include time for the Architect to review submittals (14 calendar days) or observe the work.
- 7. Identify the activities which constitute the controlling operations or critical path.
- 8. Include activities for start up and testing of equipment and/or systems, completion of punch list items and demobilization.
- d. Submittal of the Progress Schedule shall be understood to be the Contractor's representation that the schedule meets the requirements of the Contract Documents and that Work will be executed in the sequence indicated on the schedule. The Contractor shall distribute progress schedule to subcontractors for review and acceptance which will be noted on the subcontractor's letterhead to the Contractor and transmitted to the Architect and Owner for record.

1.04 SCHEDULE OF SUBMITTALS

- a. Within 15 days after the Notice to Proceed, the Contractor shall provide the Architect with the complete Contract CPM Progress Schedule.
- b. Within 30 days after Notice to Proceed, the Contractor shall provide to the Architect and Owner a copy of a project calendar delineating days and hours of work and holidays included in the schedule.
- c. Not later than the last day of each month thereafter during duration of Project, the Contractor shall provide the Architect and Owner with copies of an updated schedule showing work progress. Submittal of the updated schedule shall be attached with the request for payment and will be a condition of monthly payment.
- d. An updated schedule shall be prepared and submitted each month and shall include as a minimum the following:
 - 1. Approved changes to Contract.
 - 2. Any "slippage" due to procurement delays, rain, strikes and other delays.
 - 3. Changes in activity sequencing or duration as modified from previous submittals.

1.05 FORM OF SUBMITTAL

a. All schedule submittals shall include seven (7) copies of the submittal report and seven (7) copies of the CPM network diagram. In addition, the Contractor shall submit the schedule electronically.

- b. Costs for preparation and reproduction of all schedule submittals shall be borne by the Contractor. Contractor is presumed to have allocated such costs to the bid items he/she deemed most appropriate.
- c. Specifically, all schedule submittals shall consist of a computer-generated, time-scaled detailed graphic network diagram; a detailed narrative report; a current activity tabulation report; schedule activity analysis reports.
 - 1. The activity tabulation report generated by the current computerized schedule shall include a tabulation of each activity. The following information shall be furnished as a minimum for each activity or work items:
 - a) Preceding and succeeding event numbers.
 - b) Activity description and number.
 - c) Estimated current duration of each activity.
 - d) Earliest start date (by calendar date).
 - e) Earliest finish date (by calendar date).
 - f) Latest start date (by calendar date).
 - g) Latest finish date (by calendar date).
 - h) Scheduled float.
 - i) Percentage of activity completed, or number of working days remaining (for updates only).
 - j) Actual start date (by calendar date) (for updates only).
 - k) Actual finish date (by calendar date) (for updates only).
 - 2. The computer-generated mathematical analysis reports shall be consistent with the information shown on the detailed graphic network diagram. The computer generated mathematical analysis reports shall include the following:
 - a) A network report sorted by early start.
 - (1) A network report sorted by total float.
 - (2) A network logic report indicating the preceding and succeeding activities.
 - (3) A six (6) week look ahead schedule based on early start sort.
 - 3. The detailed narrative report shall include a summary of progress this period; describe any special problems (with proposed solutions) or assumptions underlying the CPM schedule. The report shall also include a tabulation of all activities completed or partially completed, a discussion of all activities added or deleted or changed in either logic and/or duration during the report period. The report shall state the percentage of the work actually completed as of the report date, and the progress along the critical path in terms of days ahead or behind the allowable dates.

1.06 ANALYSIS AND UPDATING OF THE SCHEDULE

- a. The Contractor is responsible for accuracy of the information contained in the schedule reports including the computerized CPM, and subsequent updates of the CPM. Producing computerized CPM schedule drawings and revisions to schedule drawings is the responsibility of the Contractor.
- b. Once each month, the Contractor shall participate with the Architect and Owner in a schedule review to update the activity progress.
- c. As part of the detailed analysis the Contractor shall discuss any planned changes in the

work, planned restraints, logic, sequence or timing of work shall be submitted in a written revision to any impacted portion of the progress schedule for the Authorities approval. Upon approval, the Contractor shall revise the computerized progress schedule in the next scheduled update.

- d. If, according to the updated CPM schedule, the Contractor is behind the milestone completion date(s), considering all approved time extensions, the Contractor shall submit a recovery schedule showing a workable plan to complete the Project on time. The Architect may assess interim withholds pursuant to Section Measurement and Payments.
- e. Scheduling of approved changes is the responsibility of the Contractor. The Contractor shall revise the schedule drawing to incorporate all activities involved in completing the change orders and submit it to the Architect for review and approval.
- f. If the Architect finds the Contractor is entitled to an extension of the completion date under the provisions of the Contract, the Architect's determination of the total number of days extension will be based upon the current analysis of the schedule and upon the data relevant to the extension.
- g. The Contractor acknowledges and agrees that delays to non-critical activities (those with float), will not be the basis for a time extension. Non-critical activities are those activities which, when delayed, do not affect the final Contract completion date.

1.07 RECOVERY SCHEDULE

- a. Where the Contractor is 7 days behind schedule the Contractor shall submit a written recovery schedule indicating how the Contractor intends to bring the Work back on schedule within the next 45 day period.
- b. Such recovery schedule shall be submitted within 7 days of submission of a current progress schedule which indicates a 7 or more day delay.
- c. The recovery schedule shall indicate any proposed adjustment to labor hours, work hours, sequencing of Work activities and/or any other approach to the construction in order to accomplish recovery of lost rime or to overcome a specific obstacle or obstacles that would otherwise hold up Work.
- d. Should the Contractor fail to submit and implement such a recovery schedule the Architect may assess interim withholds.

1.08 APPROVAL OF CPM PROGRESS SCHEDULE

- a. Neither the acceptance, review or approval of any CPM Progress Schedule or other data submitted by the Contractor pursuant to this Section, nor any other action on the part of the Architect under this Section shall in any way be deemed as a representation by the Architect that the Contract can or will be permitted to follow a particular schedule or sequence of operations or that by following any such schedule or sequence he/she can or will complete the Work by the time(s) required by the Contract or by any other time(s). Nor shall the approval of any CPM progress Schedule or other such data relieve the Contractor of his/her obligation to complete the Contract by the time(s) required in the Contact, even though such CPM Progress Schedule approved may be inconsistent with such completion.
- b. Any approval under this Section shall be construed merely to mean that the Architect and Owner knew of no good reason at that time to object thereto. No acceptance, review or approval any other action under this Section shall limit, affect or impair the Contractor's

obligation to perform all Work by time(s) required by the Contract and in accordance with all other provisions of the Contract.

1.09 PERFORMANCE OF WORK

- a. The performance of the Work by the time(s) required in the Contract after taking into account extensions to which the Contractor may be entitled may require the use by the Contractor of overtime labor, additional shifts or additional plant and equipment and/or other measures. In any event, the Contractor shall anticipate, avoid and mitigate the effects of all delays, whether or not such delays involve activities with float. The Architect and Owner shall have the right at any time when in their judgment the Work is not proceeding in accordance with the approved CPM Progress Schedule or at any time when it is likely that the Work might not be completed by the time(s) required in the Contract even though the Contractor without additional compensation, to employ additional shifts to increase the number of field staff employed, to use additional plant or equipment, or to take such other steps as may be necessary or required to assure the completion of the various operations within the time(s) allotted therefore in the approved schedule or by the aforesaid completion time(s).
- b. No action on the part of the Contractor pursuant to this Section shall be construed as request by him/her for an extension of the time(s) for completion required by the Contract. A request for an extension of time shall be deemed made only if it complies with the requirements of Section 00 74 00 - Extensions. No extension of the time(s) for completion shall be inferred because of any action, omission to act, or statement on behalf of the Owner pursuant to this Section.

END OF SECTION 01 30 28

SECTION 01 30 30 - PROJECT MEETINGS

1.01 PRECONSTRUCTION CONFERENCE

- a. Prior to commencement of the Work, the Contractor will be required to attend a preconstruction meeting at a time and a place selected by the Architect and Owner, to discuss procedures to be followed during the course of the work. The Contractor shall follow the procedures as set forth by the Architect.
- b. The purpose of the pre-Construction meeting will be to introduce the Owner's and Architect's key personnel and to review the Contract provisions, project procedures, and any other items pertaining to the Project.
- c. Attending shall be:
 - 1. Owner's Representatives
 - 2. Architect / Engineer
 - 3. Contractor Project Manager
 - 4. Contractor's Superintendent /Quality Control Rep
 - 5. Major subcontractors
 - 6. Others as appropriate
- d. At the preconstruction conference, the Architect will outline the procedures for payment, requests for information, change orders, disputes, submittals, quality control, testing, Contractor's reports, safety, field instructions, meetings, and job closeout. Contractor shall follow procedures provided at the meeting.

1.02 WEEKLY PROGRESS MEETINGS

- a. Once a week, on an agreed upon day and time, the Architect will conduct a progress meeting to review the progress and the status of the work, and to discuss any problems that may arise. The Contractor shall attend all weekly progress meetings. Subcontractor's and vendors' representatives shall attend the progress meetings as appropriate to the particular stage of the work.
- b. Weekly Progress Meetings will be held at the Airport Administration Offices, One Airport Road, Suite 300 Manchester, NH.
- c. Attending shall be:
 - 1. Owner's Representatives
 - 2. Architect / Engineer
 - 3. Contractor's Project Manager/Quality Control Rep
 - 4. Contractor's Superintendent
 - 5. Major subcontractors
 - 6. Others as appropriate
- d. The Contractor shall provide the Architect at least a day before the Progress Meeting, a three-week rolling schedule indicating the past week, current week, and the upcoming week at the weekly Meeting. The schedule will be provided in a bar chart form with information derived from the project CPM schedule, The schedule will include an item designation, activity description, start and finish dates (both scheduled and actual), a time scaled bar chart for each activity, and a remarks section. In addition, each activity will be coded to note those activities on the critical path and those activities which are behind

schedule. At the meeting, the Contractor will provide a verbal status utilizing the three week schedule indicating the progress to date and the forecast for completion.

- e. Meeting notes will be recorded and distributed to the meeting attendees by the Contractor. Attendees taking exception to anything in the meeting notes shall state their objections in writing, within 5 working days following the receipt of the notes.
- f. Contractors are to submit at the biweekly or weekly progress meetings, a sheet listing work done last week/two weeks and work proposed for the next week/two weeks, along with a CPM schedule identifying all work proposed for the next week/two weeks.

1.03 MONTHLY PROGRESS MEETINGS

- a. Each month the Contractor is required to take part in a schedule update and progress payment meeting with the Architect and Owner to agree on the percentage of the work completed up to the last working day of the current month and establishes an amount to be requested in the Application for Payment. This meeting may be combined with the weekly meeting.
- b. Monthly Progress meetings will be held at the Owner's office on or near the tenth of the month.
- c. Attending shall be:
 - 1. Owner
 - 2. Architect / Engineer
 - 3. Contractor's Project Manager
 - 4. Subcontractors as required
- d. The Contractor shall bring to the meeting, an itemized draft of the month's proposed billing for review with the Owner. For subcontracts in excess of \$10,000, the Contractor shall break down line items as to the cost of the material and the labor.
- e. Following review of the proposed billing, the Contractor shall prepare an Application for Payment and submit it to the Architect and Owner not later than the fifteenth of each month.

1.04 SPECIAL MEETINGS

From time to time as required by job conditions, the Architect may call special meetings among the representatives of the Contractor, subcontractors, and the Owner to discuss particular situations or problems which may arise. The Contractor and his/her subcontractors and/or suppliers, as appropriate, will be expected to attend.

1.05 CONTRACTOR MEETINGS

This Section does not limit meetings among the Contractor, subcontractors and others as the Contractor deems necessary. The Architect and Owner may attend the Contractor/subcontractor's meetings.

1.06 SCHEDULE APPROVAL MEETINGS

Prior to approval of the CPM schedule, the Architect may require that the Contractor and his/her subcontractors attend meetings to ascertain information for approval of the CPM schedule. This information may include, but will not be limited to, productivity, manpower loading, activity durations, logic, cost

loading, etc. The location will be at the Owner's office. Attending will be the Owner, Architect, Contractor, subcontractors as appropriate, suppliers as appropriate, others as appropriate.

1.07 OTHER REQUIRED MEETINGS

- a. Thirty days prior to the estimated final completion, the Contractor shall hold a meeting to review outstanding punch list items, maintenance manuals, guarantees, close out submittals, bonds, and service contracts for materials and equipment. Implement repair and replacement of defective items, and extend service and maintenance contracts as desired by the Owner.
- b. Location shall be the Airport Administration Offices, One Airport Road, Suite 300 Manchester, NH.
- c. Attending shall be:
 - 1. Owner
 - 2. Architect / Engineer
 - 3. Contractor
 - 4. Subcontractors, as appropriate
 - 5. Suppliers, as appropriate
 - 6. Others, as appropriate

END OF SECTION 01 30 30

SECTION 01 35 50 - GENERAL SITE SECURITY

1.01 DESCRIPTION

- a. The Contractor shall comply with all applicable federal, state and local laws. This includes but is not limited to 14 CFR Part 77 (Obstructions to Navigable Airspace), 14 CFR Part 139 (Certification of Airports) and 49 CFR Part 1542 (Airport Security).
- b. 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.
- c. 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.
- d. 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.
- e. 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, parking garage(s) and parking lots. The Federal Aviation Administration (FAA) and Transportation Security Administration (TSA) may impose fines of \$11,000.00 or more for security violations and incursions into active aircraft operation areas. In addition, the Owner may impose additional fines and/or penalties for such violations. The Contractor shall pay all fines assessed against the airport due to violations caused by the Contractor and his personnel, subcontractors, and vendors.
- f. Parking of personal cars at the Work site will not be permitted, except in areas approved by the Owner. 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.
- g. All orders for material shall instruct the supplier of the procedures to be followed.
- h. The Contractor shall submit to the Owner within 10 days after signing of the contract a written Safety Plan detailing his methods of operations including but not limited the precautions he proposes for the control of vehicle traffic including flag person, 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.
- i. All security arrangements shall be subject to the approval of the Owner.
- j. 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.

1.02 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 approved by the Owner, 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 area. When regulated by Building Code, OSHA or other authority, such legal requirements for protection shall be considered as minimum requirements; be responsible for the protection in excess of such minimum requirements as required.

1.03 WORK IN THE AIR OPERATIONS AREA

a. If the Contractor is required to perform work within the AIR OPERATIONS AREA (AOA), the Contractor shall be required to follow the requirements of Section 01 35 53 – Security Procedures.

These requirements include but are not limited to the following:

- 1. Badging and identifying Contractor personnel;
- 2. Securing access point to the AOA.

1.04 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 approved 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.

END OF SECTION 01 35 50

1.01 DESCRIPTION

- All security badge costs shall be considered incidental to the cost of the Contract and shall a. not be paid for separately.
- b. In addition to the below, the Contractor shall reference the requirements of the Manchester-Boston Regional Airport Safety and Security Phasing Plan for the project badging and gate security requirements.

IDENTIFICATION OF EMPLOYEES 1.02

- AIRPORT SIDA BADGES: Full-time competent and responsible employees of the a. Contractor, such as superintendents and foremen, shall obtain an Airport SIDA badge. The SIDA badge requires finger printing screening and a criminal history check. The badge application process may take up to 14 days, the Contractor shall plan accordingly.
- -Not Used on This Project : FY25-805-04 CONTRACTOR ESCORTED BADGES: The b. Contractor shall furnish and issue, to each of his employees and the employees of all subcontractors, an escorted identification badge which the employees will be required to wear at all times on the site. The escorted badge shall be a minimum of 2.5 inches by 4 inches, laminated in plastic, and have a clip for attaching. The escorted badge shall have the following information:
 - Employee's Name (1/8" high lettering); 1.
 - Contractor's name (1/8" high lettering); 2.
 - Subcontractor's name, if applicable (1/8" high lettering); 3.
 - 4.
 - Manchester-Boston Regional Airport (1/8" high lettering); "CONTRACTOR", "ESCORTED", "MHT" (1/4" high lettering); 5.
 - Badge Number (1/4" high lettering); 6.
 - 7. 2" by 2" color photo of employee.
 - Background color of the badge to be determined by the Owner. 8.

The Contractor shall submit a sample of the proposed badge to the Owner for approval.

- Escorted badged persons shall be escorted and within sight-line and control of an c. AIRPORT SIDA BADGED person at all times. The Contractor shall provide the SIDA badged escort to accompany the persons to be escorted and shall plan accordingly.
- -Temporary Badges will be Airport-issued as needed for this project FY25-805-04 d. TEMPORARY BADGES: Temporary badges may be issued for employees to be on the site less than one week. The temporary badges shall be as described above except for item (7).
- The Contractor shall provide the Owner with a list of employees on the job site and their e. badge number. The list shall include subcontractors and employees. The list shall be updated and submitted weekly.
- f. The Contractor's employees may be required to undergo a finger-print based criminal history records check. The Contractor's employees shall attend an Airport Security briefing prior to operating on the AOA.

1.03 CONTROL OF SITE

a. Controlled access points to the work area that impact the AOA shall be manned by an approved and trained gate guard. The Contractor shall contract through the Owner for gate guards.

END OF SECTION 01 35 53

SECTION 01 38 00 - CONSTRUCTION PHOTOGRAPHS

1.01 QUALITY ASSURANCE

a. The Contractor shall utilize a digital camera with no less than 5 mega pixel resolution. The hiring of a professional photographer is not required.

1.02 SUBMITTALS

- a. The Contractor shall comply with pertinent provisions of Section 01 34 10 Shop Drawings, Product Data and Samples.
- b. Except as otherwise directed and paid for, the Contractor shall furnish photographs of the project, in a variety of views. The photographs shall show the Project prior to construction, demolition, the Work in progress and the Project at the completion of Work.

A minimum of 10 color photographs shall be taken during each 7-day period of the Contract. A Digital or 35 mm camera shall be used to take photographs.

- c. On the back of each print, or in the filename if electronically submitted, *attach a printed label*, in a manner not damaging to the print, showing:
 - 1. Job name;
 - 2. *A descriptive* location from which photographed;
 - 3. Date of photograph;
 - 4. Photographer's name, address and photograph number.
- d. At the completion of each 30-day period of the project, the Contractor shall deliver to the Owner two color prints of each view and the negatives, or an electronic file, by a date stipulated by the Owner.
- e. The Contractor shall not permit prints to be issued for any other purpose without specific written approval from the Owner.

2.01 CONSTRUCTION PHOTOGRAPHY

- a. Photographs
 - 1. Each photograph shall be clear, in focus, with high resolution and sharpness, and with minimum distortion. Provide adequate lighting to produce clear photographs.
 - 2. The Architect may direct the Contractor to change locations as the construction progresses.

END OF SECTION 01 38 00

SECTION 01 40 00 - QUALITY CONTROL

1.01 GENERAL

- a. The Contractor shall establish, provide, and maintain an effective Quality Control Program that details the methods and procedures that will be taken to assure that all materials and completed construction required by this contract conform to contract plans, technical specifications and other requirements, whether manufactured by the Contractor, or procured from subcontractors or vendors. Although guidelines are established and certain minimum requirements are specified herein and elsewhere in the contract technical specifications, the Contractor shall assume full responsibility for accomplishing the stated purpose.
- b. The intent of this Section is to enable the Contractor to establish a necessary level of control that will:
 - 1. Adequately provide for the production of acceptable quality materials.
 - 2. Provide sufficient information to assure both the Contractor and the Architect that the specification requirements can be met.
 - 3. Allow the Contractor as much latitude as possible to develop his or her own standard of control.
- c. The Contractor shall be prepared to discuss and present, at the preconstruction conference, his/her understanding of the quality control requirements.
- d. The quality control requirements contained in this Section and elsewhere in the contract technical specifications are in addition to and separate from the Owner's testing requirements.

1.02 OWNER'S DUTIES AND RESPONSIBILITIES

The Owner has the right, but not the duty to monitor and inspect all work performed by the Contractor to insure performance of the work to the Contract Drawings and Specifications. All work shall be subject to inspection and test by the Owner at all reasonable times and at all places prior to acceptance. Any such inspection and test is for the sole benefit of the Owner and shall not relieve the Contractor of responsibility for providing quality control measures to assure that the work strictly complies with the contract requirements. No inspection or test by the Owner shall be construed as constituting or implying acceptance.

1.03 CONTRACTOR'S DUTIES AND RESPONSIBILITIES

- a. The Contractor is responsible for the quality of the work performed under this Contract as well as the quality of the material, equipment, and supplies furnished by him/her to be incorporated into the work.
- b. The Contractor shall designate a Quality Control Representative who will be on-site at all times while the respective Contractor's work is in progress and will have the authority and responsibility to accept or reject items of work. The Contractor's Quality Control Representative may delegate his/her duties but the primary responsibility and authority rest in him/her.
- c. The Contractor's Quality Control Representative shall coordinate the submittal of all shop drawings, product data and samples to the Architect. Any submittal that is a change to the

Contract requirements shall be identified as such and transmitted to the Architect. No work requiring submittal of a shop drawing, product data or sample shall be commenced until the submittal has been reviewed and accepted by the Architect.

- d. Where the Owner chooses to test any materials or equipment, the Contractor shall cooperate with the Owner's material testing laboratory. The Contractor shall notify the Owner when any material or equipment is in place in accordance with the Contract Documents and ready for testing or inspection.
- e. The Contractor shall notify the Owner two working days prior to when testing/inspection is required. The Contractor will request all tests and inspections in accordance with the Owner's request and approval for testing services procedures on the form supplied by the Owner. The Contractor will not contact the testing firms directly.
- f. The Contractor's Quality Control Representative shall review his/her drawings, procurement documents and Contracts to insure that the technical information provided and all work performed is in accordance with latest revisions of the Contract Drawings and Specifications.
- g. The Contractor's Quality Control Representative shall perform an inspection upon receipt at the site of all materials, equipment and supplies. Items which are damaged or not in conformance with the respective submittals, quality standards, Contract Drawings and Specifications will be identified and segregated from accepted items. Items thus identified shall not be incorporated into the work until corrective action acceptable to the Architect is completed. Items determined unsalvageable will be removed from the job site.
- h. The Contractor will establish a performance testing plan for all equipment and systems for mechanical, electrical, plumbing, heating or air conditioning, security, communications, and hardware.

1.04 PROJECT PROGRESS SCHEDULE

The Contractor shall submit a coordinated construction schedule for all work activities. The schedule shall be prepared as a network diagram in Critical Path Method (CPM), PERT, or other format, or as otherwise specified in the contract. As a minimum, it shall provide information on the sequence of work activities, milestone dates, and activity duration.

The Contractor shall maintain the work schedule and provide an update and analysis of the progress schedule on a twice monthly basis, or as otherwise specified in the contract. Submission of the work schedule shall not relieve the Contractor of overall responsibility for scheduling, sequencing, and coordinating all work to comply with the requirements of the contract.

1.05 SUBMITTALS SCHEDULE

The Contractor shall submit a detailed listing of all submittals (e.g., mix designs, material certifications) and shop drawings required by the technical specifications. The listing can be developed in a spreadsheet format and shall include:

- a. Specification item number;
- b. Item description;
- c. Description of submittal;

- d. Specification paragraph requiring submittal; and
- e. Scheduled date of submittal.

END OF SECTION 01 40 00

SECTION 01 40 10 - TESTING LABORATORY SERVICES

1.01 OWNER'S INDEPENDENT TESTING AGENCY

- a. The Owner shall use their independent testing agency to perform tests, inspections and sampling of the Work. Materials anticipated to be tested shall include concrete.
- b. The Owner's use of the independent testing agency shall in no way relieve the Contractor of his/her obligations to perform the work in accordance with Contract requirements.
- c. Testing costs incurred to the Owner's Independent Testing Agency for excessive repeated testing as a result of the Contractor's poor quality control of any material, shall be the responsibility of the Contractor.
- d. The testing agency is not authorized to release, revoke, alter, or enlarge on, the requirements of the Contract Documents, approve or accept any portion of the work, and perform any of the Contractor's duties.

1.02 QUALITY CONTROL/ASSURANCE

- a. The Contractor shall employ and pay their own approved Testing Laboratory, separate from the Owner's and to prepare mix designs for concrete.
- b. The Contractor's testing laboratory will be qualified to the Owner's approval in accordance with ASTM E329.
- c. Testing, when required, will be in accordance with all pertinent codes and regulations, and with selected standards of ASTM.

1.03 CONTRACTOR'S RESPONSIBILITIES

- a. Initiate and coordinate tests and inspections required by Contract Documents and public authorities having jurisdiction of the work.
- b. Notify the Owner a sufficient time in advance of the manufacture of materials to be supplied which, by requirements of the Contract Documents, must be tested at the source of supply so that the Owner may arrange for testing if appropriate.
- c. When the Owner is ready to test according to the established schedule but is prevented from testing or taking specimens due to incompleteness of the work, all extra charges for testing attributable to the delay may be backcharged to the Contractor and shall not be borne by the Owner.
- d. Provide access, facilities, tools and labor necessary for duties to be performed at the site by the Owner including furnishing ladders, hoisting, lighting, water supply and like services.
- e. Provide and maintain, for the sole use of the Owner, adequate facilities for the safe storage and proper curing of concrete test cylinders on the Project site as required by ASTM C31.
- f. Furnish and deliver samples of materials to be tested at no extra cost to Owner.
- g. Contractor's Test Reports:
 - 1. Furnish 3 copies of each test and inspection report.

1.05 PAYMENT FOR TESTING PERFORMED BY THE OWNER

- a. Initial Services:
 - 1. The Owner will pay for initial testing services when initial tests indicate compliance with the Contract Documents.
 - 2. When initial tests indicate noncompliance with the Contract Documents, the costs of re-tests associated with that noncompliance will be deducted by the Owner from the Contract Sum.
- b. When initial tests indicate noncompliance with the Contract Documents, subsequent retesting occasioned by the noncompliance shall be performed by the same testing agency, and costs thereof will be deducted by the Owner from the Contract Sum.
- c. The Contractor shall reimburse the Owner all of the inspection and testing costs incurred by the Owner due to:
 - 1. Failure of materials to pass initial tests.
 - 2. Contractor's failure to complete the work within the Contract time, and any previously authorized extensions thereof.
 - 3. Covering of work before the required inspections or tests are performed.
 - 4. Additional inspections required for Contractor's correction of defective work.
 - 5. Overtime costs of acceleration of work done for Contractor's convenience.

1.06 CONTRACTOR'S CONVENIENCE TESTING

a. Inspecting and testing performed exclusively for the Contractor's convenience shall be the sole responsibility of the Contractor.

END OF SECTION 01 40 10

SECTION 01 42 19 - REFERENCE STANDARDS

1.01 REFERENCE STANDARDS AND SPECIFICATIONS

Whenever reference standards and specifications published by technical societies, institutions, associations and governmental agencies, such as ASTM, ANSI, FS and the like are referenced in the specifications, the applicable edition shall be the latest date of issue as of the time the bids are received, except that issues listed in governing building code and regulations supersede the above requirements.

In case of conflict between referenced documents and Contract Documents, or between referenced documents, the one having more stringent requirements shall apply.

No provisions of any referenced standards or specifications (whether or not specifically incorporated by reference in the Contract Documents) shall be effective to change the duties and responsibilities of the Owner, the Architect, their offices and the Contractor, or any of their consultants, agents or employees from those set forth in the Contract Documents.

Where copies of standards are needed for proper performance of the work, the Contractor shall obtain such copies directly from the publication source. Copies of specified standards shall be maintained at the job-site by the Contractor and made available for review on request by the Owner.

Where reference standard specifications require weather protection, it shall be provided by the Contractor at no additional cost to the Owner and shall be deemed necessary in order to construct the Project within the specified time period.

END OF SECTION 01 42 19

SECTION 01 50 01 - FIELD ENGINEERING

1.01 FIELD MEASUREMENTS AND LAYOUTS

The Contractor shall be responsible for complete, timely and accurate field measurements as necessary for proper coordination, fabrication and installation of his materials and equipment. The Contractor agrees to cooperate with the Architect/Owner/Engineer, if required, to accommodate any discovered variations or deviations from the Drawings and Specifications so that the progress of the Work is not adversely affected.

END OF SECTION 01 50 01

1.01 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 15 days after Notice to Proceed, Contractor shall submit a Safety Plan for review. The Safety Plan shall not be paid for separately but shall be considered incidental to the project. The Contractor shall be required to comply with the Safety Program Plan and all applicable Federal, State, and local regulation codes, rules, laws and ordinances. When work is required in the Air Operation Areas (AOA), the Safety Program Plan shall address the provisions set forth within specification Section 00 73 04 SPECIAL PROJECT PROCEDURES.
- e. Review of the Safety Program Plan shall not relieve the Contractor of any responsibility for complying with all applicable safely regulations nor, by reviewing the Safety Program Plan, will the Owner and Architect 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 and Architect 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.

1.02 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 containers and dumpsters to eliminate attraction of birds and other wildlife as well as avoid wind-blown debris.
- g. Conduct cleaning and disposal operations to comply with local ordinances and antipollution 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. Do not dispose of wastes into streams or waterways.
- 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.

1. 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 fire fighting 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 fire fighting 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.

1.03 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, demolition program, and safety and health plan.

END OF SECTION 01 54 09

SECTION 01 57 01 - TEMPORARY CONTROLS

1.01 DESCRIPTION

- a. Noise and Vibration Control:
 - 1. Comply with all applicable state and local laws, ordinances, and regulations relative to noise control.
- b. Dust and Dirt Control:
 - 1. Conduct construction operations to prevent windblown dust and dirt from interfering with the progress of the work.
 - 2. Periodically water construction area as required to minimize the generation of dust and dirt.
 - 3. Hauling equipment and trucks carrying loads of soil and debris shall have their loads sprayed with water or covered with tarpaulins.
 - 4. Prevent dust and dirt from accumulating on walls, roadways, parking areas, and planting, and from washing into sewer and storm drains.
 - 5. Take special precautions to assure that dust and dirt does not affect the various communications and control systems.
 - 6. The Engineer reserves the right to employ outside assistance to provide corrective measures if the Contractor fails to provide proper dust control. Such incurred direct costs plus project engineering costs will be charged to the Contractor and appropriate deductions made form the Contractor's period cost estimates.
- c. Pollution Control:
 - 1. No burning of refuse, debris, or other materials will be permitted on or in the vicinity of the Project site.
 - 2. Comply with regulatory requirements and anti-pollution ordinances during the performance of construction and disposal operations, including the disposal of solid, liquid and gaseous contaminants.
- d. Cleaning:

During handling and installation of work at Project site, clean and protect work in progress and adjoining work on a basis of perpetual maintenance. Apply suitable protective covering on newly installed work where reasonably required to ensure freedom from damage or deterioration at time of substantial completion; otherwise, clean and perform maintenance on newly installed work as frequently as necessary through remainder of construction period. Adjust and lubricate operable components to ensure operability without damaging effects. See Section 01 71 01 – Cleaning.

END OF SECTION 01 57 01

1.01 SUMMARY

- a. This Section specifies administrative and procedural requirements governing the Contractor's selection of products for use in the Project.
- b. The Contractor's Construction Schedule and the Schedule of Submittals are included under Section 01 30 00 Submittals.
- c. <u>Standards</u>: Refer to Section "Definitions and Standards" for applicability of industry standards to products specified.
- d. Administrative procedures for handling requests for substitutions made after award of the Contract are included under Section "Product Substitutions."

1.02 DEFINITIONS

- a. <u>Definitions</u> used in this Article are not intended to change the meaning of other terms used in the Contract Documents, such as "specialties," "systems," "structure," "finishes," "accessories," and similar terms. Such terms such are self-explanatory and have well recognized meanings in the construction industry.
- b. <u>"Products"</u> are items purchased for incorporation in the Work, whether purchased for the Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
- c. <u>"Named Products"</u> are items identified by manufacturer's product name, including make or model designation, indicated in the manufacturer's published product literature, that is current as of the date of the Contract Documents.
- d. <u>"Materials"</u> are products that are substantially shaped, cut, worked, mixed, finished, refined or otherwise fabricated, processed, or installed to form a part of the Work.
- e. <u>"Equipment"</u> is a product with operational parts, whether motorized or manually operated, that requires service connections such as wiring or piping.

1.03 SUBMITTALS

a. <u>Product List Schedule</u>: Prepare a schedule showing products specified in a tabular form acceptable to the Architect. Include generic names of products required. Include the manufacturer's name and proprietary product names for each item listed.

Coordinate the product list schedule with the Contractor's Construction Schedule and the Schedule of Submittals.

- b. <u>Form</u>: Prepare the product listing schedule with information on each item tabulated under the following column headings:
 - 1. Related Specification Section number.
 - 2. Generic name used in Contract Documents.
 - 3. Proprietary name, model number and similar designations.
 - 4. Manufacturer's name and address.
 - 5. Supplier's name and address.
 - 6. Installer's name and address.
 - 7. Projected delivery date, or time span of delivery period.

- c. <u>Initial Submittal</u>: Within 7 days after date of commencement of the Work, submit 3 copies of an initial product list schedule. Provide a written explanation for omissions of data, and for known variations from Contract requirements.
- d. <u>Completed Schedule</u>: Within 30 days after date of commencement of the Work, submit 3 copies of the completed product list schedule. Provide a written explanation for omissions of data, and for known variations from Contract requirements.
- e. <u>Architect's Action</u>: The Architect will respond in writing to the Contractor within 2 weeks of receipt of the completed product list schedule. No response within this time period constitutes no objection to listed manufacturers or products, but does not constitute a waiver of the requirement that products comply with Contract Documents. The Architect's response will include the following:
 - 1. A list of unacceptable product selections, containing a brief explanation of reasons for this action.

1.04 QUALITY ASSURANCE

- a. <u>Source Limitations</u>: To the fullest extent possible, provide products of the same kind, from a single source.
 - 1. When specified products are available only from sources that do not or cannot produce a quantity adequate to complete project requirements in a timely manner, consult with the Architect for a determination of the most important product qualities before proceeding. Qualities may include attributes relating to visual appearance, strength, durability, or compatibility. When a determination has been made, select products from sources that produce products that possess these qualities, to the fullest extent possible.
- b. <u>Compatibility of Options</u>: When the Contractor is given the option of selecting between two or more products for use on the Project, the product selected shall be compatible with products previously selected, even if previously selected products were also options.
- c. <u>Nameplates</u>: Except for required labels and operating data, do not attach or imprint manufacturer's or producer's nameplates or trademarks on exposed surfaces of products which will be exposed to view in occupied spaces or on the exterior.
- d. <u>Labels</u>: Locate required product labels and stamps on a concealed surface or, where required for observation after installation, on an accessible surface that is not conspicuous.
- e. <u>Equipment Nameplates</u>: Provide a permanent nameplate on each item of service-connected or power-operated equipment. Locate on an easily accessible surface which is inconspicuous in occupied spaces. The nameplate shall contain the following information and other essential operating data:
 - 1. Name of product and manufacturer.
 - 2. Model and serial number.
 - 3. Capacity.
 - 4. Speed.
 - 5. Ratings.

- a. Deliver, store and handle products in accordance with the manufacturer's recommendations, using means and methods that will prevent damage, deterioration and loss, including theft.
- b. Schedule delivery to minimize long-term storage at the site and to prevent overcrowding of construction spaces.
- c. 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.
- d. Deliver products to the site in the manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting and installing.
- e. Inspect products upon delivery to ensure compliance with the Contract Documents, and to ensure that products are undamaged and properly protected.
- f. Store products at the site in a manner that will facilitate inspection and measurement of quantity or counting of units.
- g. Store heavy materials away from the Project structure in a manner that will not endanger the supporting construction.
- h. Store products subject to damage by the elements above ground, under cover in a weather tight enclosure, with ventilation adequate to prevent condensation. Maintain temperature and humidity within range required by manufacturer's instructions.

1.06 PRODUCT SELECTION

- a. <u>General Product Requirements</u>: Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, unused at the time of installation.
 - 1. Provide products complete with all accessories, trim, finish, safety guards and other devices and details needed for a complete installation and for the intended use and effect.
- b. <u>Standard Products</u>: Where available, provide standard products of types that have been produced and used successfully in similar situations on other projects.
- c. <u>Product Selection Procedures</u>: Product selection is governed by the Contract Documents and governing regulations, not by previous Project experience.
- d. <u>Semi-Proprietary Specification Requirements</u>: Where three or more products or manufacturers are named, provide one of the products indicated. No substitutions will be permitted.
- e. <u>Non-Proprietary Specifications</u>: When the Specifications list less than three products or manufacturers that are available and may be incorporated in the Work, but do not restrict the Contractor to use of these products only, the Contractor may propose any available product that complies with Contract requirements. Comply with Contract Document provisions concerning "substitutions" to obtain approval for use of an unnamed product.

- f. <u>Performance Specification Requirements</u>: Where Specifications require compliance with performance requirements, provide products that comply with these requirements, and are recommended by the manufacturer for the application indicated. General overall performance of a product is implied where the product is specified for a specific application.
 - 1. Manufacturer's recommendations may be contained in published product literature, or by the manufacturer's certification of performance.
- g. <u>Compliance with Standards, Codes and Regulations</u>: Where the Specifications only require compliance with an imposed code, standard or regulation, select a product that complies with the standards, codes or regulations specified.
- h. <u>Visual Matching</u>: Where Specifications require matching an established Sample, the Architect's decision will be final on whether a proposed product matches satisfactorily.
 - 1. Where no product available within the specified category matches satisfactorily and also complies with other specified requirements, comply with provisions of the Contract Documents concerning "substitutions" for selection of a matching product in another product category, or for noncompliance with specified requirements.
- i. <u>Visual Selection</u>: Where specified product requirements include the phrase "...as selected from manufacturer's standard colors, patterns, textures..." or a similar phrase, select a product and manufacturer that complies with other specified requirements. The Architect will select the color, pattern and texture from the product line selected.
- j. <u>Allowances</u>: Refer to individual Specification Sections and "Allowance" provisions in Division-1 for allowances that control product selection, and for procedures required for processing such selections.

1.07 INSTALLATION OF PRODUCTS

- a. Comply with manufacturer's instructions and recommendations for installation of products in the applications indicated. Anchor each product securely in place, accurately located and aligned with other Work.
 - 1. Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

END OF SECTION 01 60 00
1.01 PRODUCTS

- a. The term "product" includes materials, systems, and equipment. Products shall be new, undamaged, of the types specified, and furnished in ample quantities to facilitate proper execution of the work.
- b. When requesting a product substitution, select an option which is compatible with other products already specified
- c. Where available, provide standard products or types which have been produced and used previously and successfully on other Projects and in similar applications.

1.02 LIST OF PRODUCTS

- a. Include substitutions in the required submittal list (Section 01 30 00 Submittals), showing the names of the manufacturers proposed to be used for each of the products identified in the Specifications, and, where applicable, the name of the installer.
- b. The Architect will reply, in writing, to the Contractor stating whether, after due investigation, there is reasonable objection to any such proposal. If adequate data on any proposed manufacturer or installer is not available, the Architect may state that action will be deferred until the Contractor provides further data. No reply by the Architect shall not constitute waiver of any requirement.
- c. Up to and until 60 days after the date of the Notice to Proceed, the Architect will consider the Contractor's formal requests for substitutions in place of the specified items under the conditions set forth in this Section, assuming the item was listed in paragraph A above. No requests will be considered 60 days after the Notice to Proceed except as specified in this Section.

1.03 CONTRACTOR'S OPTIONS

- a. The Contractor has the following options:
 - 1. For products specified only by reference standards, select any product meeting those standards, by any manufacturer.
 - 2. For products specified by naming several products or manufacturers, select one of the specified products or manufacturers or submit a request, as required by this Section, for substitution, for any product not specifically named. Where only one manufacturer is specified but other manufacturers are listed as acceptable, their products shall be treated as a substitution and submitted in accordance with the requirements specified in this Section.
 - 3. For products specified by naming one or more products, but indicating the option of selecting equivalent products by stating "or equal", "equal to", or "approved equal", "equivalent to"; submit a request, as required by this Section, for substitution, for any product not specifically named.
 - 4. If it is known that a specified product is not a feasible or acceptable selection, notify the Architect in writing before proceeding with the purchase of the product.

- 5. Where only compliance with an imposed standard, code, or regulation is required, select any product satisfying the requirement.
- 6. Where matching with an existing sample is required, the final decision whether a product proposed matches the sample satisfactorily is the Architect's judgment.
- 7. Except as otherwise indicated, where Specifications include the statement: "as selected from manufacturer's standard colors, patterns, textures..." or words of similar effect, the selection of manufacturer and basic product (complying with Specifications) is the Contractor's option, and the selection of color, pattern, and texture shall be the Architect's selection.

1.04 REQUIREMENTS FOR SUBSTITUTIONS

- a. Products proposed for substitution shall comply with specific performances indicated and/or specified, and which are recommended by the manufacturer (in published product literature or by individual certification) for application indicated. Overall performance of a product is implied where product is specified with only certain specific performance requirements.
- b. Products proposed for substitution shall have been produced in accordance with prescriptive requirements, using specified ingredients and components, and complying with specified requirements for fabricating, finishing, testing, and similar operations in manufacturing process.
- c. A proposed substitution shall not be purchased or installed by the Contractor without written acceptance from the Architect. Acceptance of any substitution shall not relieve the Contractor from responsibility for the proper execution of the work and any other requirements specified in the Contract Documents.
- d. The Contractor shall be responsible for the effect of a substitution of related work in the Project, and shall pay additional costs generated by a substitution, including the costs of the Architect's additional services.
- e. The burden of proving that the proposed substitution is "equal to the specified product is upon the Contractor and such proof shall include sufficient factual and comparative data and information necessary to establish that the requested substitution is equal in quality, utility, structural strength, mechanical and technical performance, finish, arrangement of plan, repair and maintenance, compatibility with other existing or specified items, and any other relevant data.
- f. By making a request for substitution, the Contractor:
 - 1. Represents that he has personally investigated the proposed substitute product and has determined that it is equal or superior in all respects to the specified product.
 - 2. Represents that he will provide the same warranty for the substitution that he would have for the specified product.
 - 3. Certifies that the cost data presented is complete and includes all related costs under the contract.
 - 4. Waives all claims for additional costs or schedule impact related to the substitution which subsequently become apparent.

- 5. Will coordinate the installation of the substitute, making sure changes as may be required for the work to be complete in all respects.
- g. Substitutions will not be considered if:
 - 1. They are indicated or implied on shop drawings or product data submittals without formal request submitted in accordance with this Section.
 - 2. Acceptance will require substantial revision of the Contract Documents.
 - 3. The proposed product is inferior to the specified product as judged by the Architect.
 - 4. Request does not include sufficient data for the Architect to make a reasonable judgment regarding the acceptability of the proposed substitution.
- h. The Architect will be the judge of the acceptability of proposed substitutions, and his determination will be final.
- i. Approval of a substitution shall not relieve the Contractor from responsibility for the proper execution of the work and other requirements of the Contract Documents.
- j. If a substitution is rejected, provide the product originally specified.

1.05 REQUESTS FOR SUBSTITUTIONS

- a. Submit 2 copies of a written request for a substitution and data substantiating the request to the Architect in enough advance notice to allow a thorough evaluation by the Architect. Each request shall include the following:
 - 1. Complete technical data of all characteristics of the originally specified item, including drawings, reference standards, performance specifications, cost data, samples, and test reports of the product proposed for substitution. Submit additional information if requested by the Architect. Annotate the specific salient characteristics which are being compared to those of the originally specified item. The mere submission of catalog cuts and/or other data without the annotation is not acceptable. See the following paragraph which requires line-by-line comparison.
 - 2. Data similar to that specified for the item for which the substitution is proposed. Include a line-by-line comparison of characteristics between specified item and proposed substitute documenting equal status. Highlight by underlining or other means characteristics that are different from those of the specified item. Equivalency will be based on salient characteristics as determined by the Architect.
 - 3. Effect on the progress schedule.
 - 4. Complete breakdown of costs indicating the cost amount to be added to or deducted from the Contract Sum if the proposed substitution is accepted.
 - 5. Certification by the Contractor that the proposed substitution is in compliance with the Contract Documents and applicable regulatory requirements.
 - 6. List of other work, if any, which may be affected by the substitution.

- 7. Availability of maintenance service and source of replacement materials.
- 8. Samples, if requested, of both the originally specified product and the proposed substitute product.
- 9. Name and address of similar Projects on which the proposed substitute product was used. Include name, address and telephone numbers of the Architect for each Project.
- 10. Sample of standard form of guarantee or warranty offered by the manufacturer for the substitute product proposed.

1.06 REQUESTS FOR SUBSTITUTIONS AFTER TIME SPECIFIED

- a. No substitution of materials, products, or equipment will be considered after the time described in the above paragraphs unless the specified material cannot be delivered or incorporated into the work in the time allowed due to conditions beyond the control of the Contractor.
- b. The Contractor shall reimburse the Architect's cost for additional services required by the Architect to review and process substitutions.
- c. Written requests for substitutions shall include reasons for the request, proof that delivery is impossible, complete description and data of the proposed substitute necessary for a complete evaluation of costs, delivery time, and other necessary information.
- d. Costs of delays which could have been avoided by the timely submission of requests for substitutions shall be borne by the Contractor.

1.07 SUBSTITUTION PROCESSING

a. Submit substitutions on a Request for Information form; follow the request for information processing requirements. In addition, maintain a Request for Substitution log which will indicate the following: The RFI number, description, the date submitted to the Architect, the date required for return, the date returned from the Architect, and comments. This log will be reviewed at the weekly progress meetings.

END OF SECTION 01 60 01

SECTION 01 60 02 - DELIVERY, STORAGE & HANDLING

1.01 TRANSPORTATION AND HANDLING

- a. Manufactured products shall be delivered in the manufacturer's original unbroken containers or packaging, with identifying labels intact and legible.
- b. Immediately on delivery, inspect shipments to assure compliance with requirements of Contract Documents and approved submittals, and verify that products are properly protected and undamaged.
- c. Handle products and packages in a manner to avoid soiling or damaging. Promptly remove damaged or defective products from the site, and replace at no increase in Contract Sum.
- d. Tight wood sheathing shall be laid under any materials that are stored or moved over finished surfaces. Reinforced non-staining kraft building paper and plywood or planking shall be laid over all types of finished floor surfaces in traffic areas before moving any material over these finished areas. Wheelbarrows, if used over such areas, shall have rubber-tired wheels.

1.02 STORAGE

- a. Store manufactured products in accordance with the manufacturer's instructions, with seals and labels intact and legible.
 - 1. Store products subject to damage by the elements in weathertight enclosures. Maintain temperature and humidity within the ranges specified by the manufacturers.
 - 2. Control delivery schedules to minimize long-term storage at site, particularly for products recognized to be flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other sources of loss.
- b. Exterior Storage:
 - 1. Store fabricated products above the ground on blocking or skids to prevent soiling and staining.
 - 2. Cover products subject to deterioration with impervious sheet coverings; provide adequate ventilation to avoid condensation.
- c. Periodically inspect stored products to assure that specified conditions are maintained and the products are free from damage or deterioration.
- d. Protection after Installation:
 - 1. Provide coverings necessary to protect installed products from damage due to traffic or construction operations. Remove coverings when no longer needed.
 - 2. Maintain temperature and humidity conditions for interior equipment and finish products in accordance with the manufacturers' instructions.
- e. The Contractor will be permitted to store equipment needed for the immediate work on hand within the Work area as approved by the Owner. Equipment not in use will be returned to the appropriate Contractor's staging area. All equipment booms shall be lowered at the close of each day's work or when stored. All equipment will be parked in the staging area at the close of work each day and whenever it is not in use. END OF SECTION 01 60 02

1.01 DESCRIPTION

- a. This Section describes the requirements for cleaning.
 - 1. Keep premises free from accumulations of waste, debris, and rubbish, caused by operations.
 - 2. At completion of Work, remove waste materials, rubbish, tools, equipment, machinery and surplus materials, and clean all exposed surfaces; leave Project clean and ready for occupancy.

1.02 MATERIALS

- a. Use only cleaning materials recommended by manufacturer of surface to be cleaned.
- b. Use cleaning materials only on surfaces recommended by cleaning material manufacturer.

1.03 COORDINATION

- a. The Contractor shall assume all financial responsibilities incurred by the Airport, its tenants, and/or customers in the event life safety systems of the Airport are activated by Contractor's cleaning activities (e.g., sweeping dust and tripping a smoke alarm).
- b. The Contractor shall coordinate cleaning activities with the Owner. The Contractor shall comply with all Airport policies regarding cleaning activities.

1.04 CLEANING DURING CONSTRUCTION

- a. Keep premises free from accumulations of waste materials and rubbish.
- b. At least once a week, or sooner if required, clean work area and dispose of waste materials, debris and rubbish off the site in a legal manner. Remove combustible materials such as paper and cardboard daily.
- d. Provide on-site containers for collection of waste materials, debris and rubbish. Provide a collection can at each location used as an eating area. Pick up all garbage daily.
- e. Remove waste materials, debris and rubbish from site and legally dispose of legally off Owner's property. Do not bury or burn waste materials at the site.
- f. Vacuum clean interior areas when ready to receive finish painting and continue vacuum cleaning on an as-needed basis until work area is ready for substantial completion or occupancy.
- g. All rubbish shall be lowered by way of chutes or taken down on hoists or lowered into receptacles. Under no circumstances shall rubbish or waste be dropped or thrown from one level to another within or outside the building.
- h. Schedule cleaning operations so that dust and other contaminants resulting from cleaning process will not fall on wet newly painted surfaces.

1.05 FINAL CLEANING

- a. Employ experienced workmen or professional cleaners for final cleaning.
- b. In preparation for Substantial Completion or Occupancy, conduct final inspection of sight-exposed interior and exterior surfaces, and of concealed spaces.
- c. Remove grease, dust, dirt, stains, labels, fingerprints and other foreign materials from sightexposed interior finished surfaces; polish bright surfaces to shine finish.
- d. Repair, patch and touch-up marred surfaces to specified finish to match adjacent surfaces.
- e. Broom clean paved surfaces; rake clean other surfaces of grounds.
- f. Keep Project clean until it is occupied by Owner.
- g. Wipe surfaces of mechanical and electrical equipment clean, remove excess lubrication and other substances.
- h. Replace all used filters.
- i. Clean non-occupied spaces and limited-access spaces (such as plenums, shafts, equipment vaults, attics, and similar spaces) broom clean and free of surface dust.
- j. Vacuum clean carpeted surfaces and similar soft surfaces.
- k. Clean plumbing fixtures to a sanitary condition, free of stains including those resulting from water exposure.
- 1. Clean light fixtures and lamps so as to function with full efficiency.
- m. Except as otherwise indicated or requested by Owner, remove temporary protection devices and facilities.
- n. Where extra materials of value remain dispose of these to Owner's best advantage as directed.
- o. Clean all electronic detectors so as to function with full efficiency.

END OF SECTION 01 71 00

SECTION 01 71 10 - CUTTING AND PATCHING

1.01 DESCRIPTION

- a. The Contractor shall perform all cutting, fitting or patching required to:
 - 1. Make parts fit properly.
 - 2. Uncover work to permit the installation of ill-timed work.
 - 3. Remove and replace work not conforming to requirements of Contract Documents.
 - 4. Remove samples of installed work as may be required for testing.
- b. In addition to Contract requirements, upon the Architect's written instructions the Contractor shall:
 - 1. Uncover work to permit the Architect's observation of covered work.
 - 2. Remove samples of installed materials for testing.
 - 3. Perform any other cutting and patching directed by the Architect.
- c. The Contractor shall not endanger any work by cutting or altering work or any part of it.

1.02 QUALITY ASSURANCE

- a. Design Criteria:
 - 1. Patching shall achieve security, strength, and weather protection, and shall preserve continuity of existing fire ratings.
 - 2. Patching shall successfully duplicate undisturbed adjacent finishes, colors, textures, and profiles. Where there is dispute as the whether duplication is successful or has been achieved, the Architect's judgment will be final.

1.03 SUBMITTALS

- a. The Contractor shall submit written notice to the Architect requesting permission to proceed with cutting before any cutting, which affects:
 - 1. Structural integrity of any element of the Work.
 - 2. Integrity of weather-exposed or moisture-resistant element.
 - 3. Efficiency, maintenance, or safety of any operational element.
 - 4. Visual qualities of sight-exposed elements.
 - 5. Work of separate contractor.
- b. Include in request:
 - 1. Identification of the Work.

- 2. Location and description of affected work.
- 3. Necessity for cutting or alteration.
- 4. Description of proposed work, and products to be used.
- 5. Alternatives to cutting and patching.
- 6. Effect on work of separate contractor.
- 7. Written permission of affected separate contractor.
- 8. Date and time-work will be executed.
- c. Should conditions of work or schedule indicate change of materials or methods, the Contractor shall submit written recommendation to the Architect, including:
 - 1. Conditions indicating change.
 - 2. Recommendations for alternative materials or methods.
 - 3. Submittals as required for substitutions.
- d. The Contractor shall submit 2 working days advanced written notice to the Architect designating the time the Work will be uncovered.

1.04 MATERIALS

a. Materials shall be as specified in the applicable sections of the Specifications (and as required to match existing construction).

1.05 INSPECTION

- a. Inspect existing conditions of work, including elements subject to movement or damage during cutting and patching, and excavating and backfilling.
- b. After uncovering work, inspect conditions affecting installation of new products.
- c. Beginning of cutting or patching means acceptance of existing conditions.

1.06 PREPARATION PRIOR TO CUTTING

- a. Provide shoring, bracing and support as required to maintain structural integrity.
- b. Provide protection for other portions of Project.
- c. Provide protection from elements.

1.07 PERFORMANCE

- a. Fit and adjust products to permit the finished installation to comply with specified tolerances and finishes.
- b. Perform cutting and demolition by methods which will prevent damage to other work, and will provide proper surfaces to receive installation of repairs and new work.

- c. Perform cutting, associated structural reinforcing, and patching not required to be performed as part of the work of other Sections.
- d. Perform cutting, associated structural reinforcing, and patching to prevent damage to other work and to provide proper surfaces for the installation of materials, equipment, and repairs.
- e. Do not cut or alter structural members without prior approval of the Architect.
- f. Employ original installer or fabricator providing work under this Contract to perform cutting and patching for new:
 - 1. Weather-exposed and moisture-resistant products.
 - 2. Fireproofing.
 - 3. Finished surfaces exposed to view.
- g. Adjust and fit products to provide a neat installation.
- h. Finish or refinish cut and patched surfaces to match adjacent finishes. Paint over complete surface plane, unless otherwise indicated. Over patched wall or ceiling surfaces, paint to nearest cutoff line for entire surface, such as intersection with adjacent wall or ceiling, beam pilasters, or to neatest opening frame, unless otherwise indicated. Surfaces shall not present a spotty, touched-up appearance.

END OF SECTION 01 71 10

SECTION 01 78 00 - PROJECT CLOSEOUT

1.01 PREPARATION FOR SUBSTANTIAL COMPLETION

- a. When the work is substantially complete, submit the following to the Architect:
 - 1. A written notice that the work is substantially complete.
 - 2. A detailed, complete, and comprehensive list of items to be completed or corrected.
 - 3. Certification that all mechanical, electrical, plumbing, security, communications, and hardware equipment has been tested and is operational. The Contractor will provide copies of all test results and reports including a binder by division fully indexed, outlining all equipment and performance tests. In addition, the Contractor will certify the Airport's maintenance and operational personnel have received the specified training. (Section 01 78 09 Operating and Maintenance Data.)
- b. After receipt of the above items, the Architect shall set up an inspection to determine whether or not the Project, or portion of the Project, is ready for Punch List Inspection.
- c. Should the Architect determine that the work is so incomplete it does not warrant a punch list inspection, the Architect shall:
 - 1. Within a reasonable amount of time, notify the Contractor in writing that the work is incomplete. Charges may be assessed for reinspection.
 - 2. Instruct the Contractor to promptly remedy the deficiencies in the work and send a second notice of substantial completion to the Owner.

1.02 ACHIEVING SUBSTANTIAL COMPLETION

- a. When the Architect determines that the Work is ready for the Punch List Inspection, the Contractor will arrange for the inspection by the Architect and representatives of the Owner as necessary.
- b. The Architect shall prepare a coordinated Punch List and will determine which items shall be completed by the Contractor to achieve substantial completion.
- c. The Architect will transmit the Punch List to the Contractor and Owner and will advise the Contractor as to the items that he must complete to achieve Substantial Completion.
- d. Beneficial Occupancy and Substantial Completion are not one and the same. The Owner has the right to beneficially occupy any portion of the Project, or the Project as a whole, at any time in accordance with the General Conditions.

1.03 SUBSTANTIAL COMPLETION

- a. When the specific Punch List items have been completed to the extent that the Work can be utilized for the intended use, the Architect will prepare a Certificate of Substantial Completion for the Owner and will attach a list of the balance of the punch list items to be completed for final completion. Other items which do not conform to the Contract Documents may be added to the list at any time.
- b. At Substantial Completion, the Owner has the right to move in furnishings and equipment, and initiate its security control system. On all final Punch List work after the security system has been activated, the Contractor's work force, equipment, and material may be subject to security procedures, including searches. Any delay associated with this process is part of the base Contract and will not be considered as an extra cost under the Contract.

1.04 FINAL COMPLETION

- a. When the Contractor considers the work to be complete for final inspection, he shall submit written certification that:
 - 1. Contract Documents have been reviewed.
 - 2. Work has been inspected for compliance with the Contract Documents.
 - 3. Work has been completed in accordance with the Contract Documents.
 - 4. Work is completed and ready for final inspection.
 - 5. Obtain the required "Certificate of Occupancy".
- b. After receipt of the above, the Architect will set up an inspection to determine whether or not the Project is ready for final inspection. The review shall consist of verifying that the remaining Punch List items from the Substantial Completion inspection have been completed.
- c. Should the Architect find the work to be incomplete, the Architect shall advise the Contractor in writing that the work is not acceptable. The Contractor may be assessed for additional inspection costs.
- d. The Contractor shall send another Certificate when the work is complete.
- e. After the Architect has completed the final inspection and finds that the work is complete under the Contract Documents, the 'The Date of Final Completion' shall be determined, and the Contractor notified. The Contractor shall proceed to prepare for final closeout/acceptance and shall make final closeout submittals.

1.05 CLOSEOUT/ACCEPTANCE

- a. Responsibilities of the Contractor, prior to acceptance by the Architect, shall include but may not be limited to:
 - 1. Submitting a statement showing accounting of changes to the Contract Sum.
 - 2. Submitting warranties, maintenance agreements, final certifications, and similar documents required by the Contract Documents.
 - 3. Submit certification that materials used are asbestos free.
 - 4. Advising the Owner of pending insurance change-over requirements.
 - 5. Obtaining and submitting releases enabling the Owner's full and unrestricted use of the work and access to services and utilities, including where required, occupancy permits, operating certificates, and similar releases. Provide all release of liens from subcontractors and suppliers.
 - 6. Submitting final record documents, operations & maintenance manuals and data, damage or settlement surveys, property surveys, and similar final record information as required by the Contract Documents. The Owner may withhold final payment of retainage until the record documents and operations & maintenance manuals and data have been accepted.
 - 7. Delivering tools, spare parts, extra stocks of materials, and similar physical items to the Owner.
 - 8. Removing all temporary facilities and services, along with construction tools and equipment mock-ups, and similar elements.
 - 9. Preparing final Application for Payment in accordance with the General Conditions and these Specifications.
 - 11. Submitting signed lien waiver forms.
- b. After acceptance of the Work, the final payment will be made.

SECTION 01 78 08 - RECORD DOCUMENTS

1.01 DESCRIPTION

- 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 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 and Architect shall have access to record documents at any time prior to final turn over to the Owner.

1.02 DOCUMENTS REQUIRED

- a. Maintain at the site the following record documents:
 - 1. Complete Contract Drawing set.
 - 2. Specifications and Addenda.
 - 3. Change Orders and other modifications to the Contract.
 - 4. Field Instructions and other written instructions from the Architect.
 - 5. Reviewed shop drawings, product data, and samples.
 - 6. Test Reports.
 - 7. Requests for Information.
 - 8. General Correspondence.
 - 9. Record Document Drawings.

1.03 MAINTENANCE OF DOCUMENTS AND SAMPLES

- a. Store record documents and samples in Contractor's field office apart from documents used for construction. Provide files and racks for storage of documents. Provide locked cabinets or secure storage space for storage of samples.
- b. Make documents and samples available at all times for inspection by the Architect and Owner.
- c. Update the documents within 24-hours after receiving information that a change has occurred or clarification has been issued.

1.04 MARKING DEVICES

a. Non-fade felt tip marking pens shall be used for recording information. Green marks shall be used for added items; red marks shall be used for deleted items; and yellow marks shall be used for unchanged items.

1.05 RECORDING

a. Record information concurrently with the construction process. Legibly mark drawings to record actual construction. The Contractor shall comply with the following:

Completely, accurately, and legibly record, to the satisfaction of the Architect, all

1. Do not conceal any work until required information is recorded.

2.

deviations in construction.

- 3. Record any deviations caused by approved changes and/or clarifications to the work.
- 4. Use additional copies of prints, if necessary, to insure legible recording of data
- 5. Date all entries.
- 6. Call attention to the entry by drawing a 'cloud' around the area affected on each drawing.
- 7. Post details not on original contract drawings.
- 8. All Record Documents shall show both the original design and the final design. (Example: if a utility location, type, etc. has deviated from the original design, the old data should be crossed out and new data shall be shown.)
- 9. All elevations and coordinates shall be in the same horizontal and vertical datum as the contract documents.
- b. Stamp each Record Document drawing with the following information:
 - 1. "RECORD DOCUMENT"
 - 2. Prepared by: Contractor's name, permanent address.
 - 3. Date prepared.
 - 4. Contractor's (Principal of firm) typed name and signature.
 - 5. In typed words on each drawing the following statement: "______(Insert Contractor firm name) hereby certifies that to best of our knowledge that these Record Document drawings represent a true and accurate record of the work in-place."
- c. Legibly mark each section of the specifications to record the following:
 - 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.
- d. Maintain shop drawings as record drawings. Legibly annotate shop drawings to record changes made after approval.

1.06 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 Technical Specifications.

1.07 SUBMITTAL

a.

Thirty (30) calendar days after Substantial Completion, submit the record documents

prepared in accordance with this specification. The Architect shall have thirty (30) calendar days from receipt of the record documents for review and comment. Record documents found deficient shall be returned to the Contractor after the specified review period. The Contractor shall have fourteen (14) calendar days to correct deficiencies and return corrected record documents. The Contractor shall be required to meet with the Architect and Owner to review the contents of the Record Documents.

1.08 PAYMENT

- a. Prior to submitting each request for payment, status of Record Documents shall be reviewed.
- b. Periodic Payments or portions thereof to the Contractor may be withheld until the Owner verifies that as-built information has been properly recorded on the Record Documents.
- c. The Owner may withhold final payment of retainage until the Record Documents have been accepted by the Owner.

1.09 RESPONSIBILITY

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

END OF SECTION 01 78 08

SECTION 01 78 09 - OPERATING AND MAINTENANCE DATA

1.01 DESCRIPTION

- a. This Section describes the requirements for furnishing product data and related information appropriate for Owner maintenance and operation of products furnished under the Contract.
 - 1. The Contractor shall prepare operating and maintenance data as specified in this Section and as referenced in other Sections.
 - 2. The Contractor shall be responsible for the instruction of Owner personnel in the maintenance of products and in the operation of equipment and systems.

1.02 QUALITY ASSURANCE

a. Preparation of data shall be done by personnel trained and experienced in maintenance and operation of the described products, completely familiar with specified requirements, skilled as a technical writer to the extent required to communicate essential data, and skilled as a draftsman competent to prepare required drawings.

1.03 FORM OF SUBMITTAL

- a. Prepare data in the form of an instructional manual for use by Owner personnel. The instructional/user's manual will be prepared to organize and synthesize documents along with operating instructions and functional information. The manual will be used as the single source of information about the equipment and systems operations, and functions.
- b. Format:
 - 1. Size: 8-1/2-inch x 11-inch.
 - 2. Paper: 24-pound minimum, white, for typed pages.
 - 3. Electronic Media: In addition to paper, submit in duplicate Operation & Maintenance Manuals and Data on CD/DVD.
 - 4. Text: Manufacturer's printed data, or neatly typewritten.
 - 5. Drawings: Provide reinforced punched binder tab, bind in with text. Fold larger drawing to the size of the text pages.
 - 6. Provide fly-leaf for each separate product, or each piece of operating equipment. Provide typewritten description of product, and major component parts of equipment. Provide indexed tabs.
 - 7. Cover: Identify each volume with typed or printed title 'OPERATING AND MAINTENANCE INSTRUCTIONS'. List title of Project, identity of separate structure as applicable, and identity of general subject matter covered in the manual.
- c. Binders: Commercial quality three-ring binders with durable and cleanable plastic covers.

1.04 CONTENT OF MANUAL

- a. Neatly typewritten table of contents for each volume, arranged in a systematic order.
 - 1. Contractor, name of responsible principal, address and telephone number.
 - 2. A list of each product and certification warranty/guarantee required to be included, indexed to the content of the volume.
 - 3. List, with each product, the name, address, and telephone number of:

- a) Subcontractor or installer.
- b) Maintenance contractor, as appropriate.
- c) Identify the source of responsibility of each.
- d) Local source of supply for parts and replacements.
- 4. Identify each product by product name and other identifying symbols as set forth in the Contract Documents.
- b. Product Data:
 - 1. Include only those sheets which are pertinent to the specific product.
 - 2. Annotate each sheet to:
 - a) Clearly identify the specific product or part installed.
 - b) Clearly identify the data applicable for the installation.
 - c) Delete references to inapplicable information.
- c. Drawings:
 - 1. Supplement product data with drawings as necessary to clearly illustrate:
 - a) Relations of component parts of equipment and systems.
 - b) Control and flow diagrams.
 - 2. Coordinate drawings with information on Project Record Documents to assure correct illustration of completed installation.
 - 3. Do not use Project Record Documents as maintenance drawings.
- d. Written text is required to supplement product data for the particular installation for all mechanical, electrical, plumbing, heating, air conditioning, security, hardware, and communication systems.
 - 1. Organize in a consistent format under separate headings for different procedures.
 - 2. Provide a logical sequence of instructions for each procedure.
- e. Copy of each warranty, bond and service contract issued.
 - 1. Provide information sheet for Owner personnel; include:
 - a) Proper procedures in the event of failure.
 - b) Instances which might affect the validity of warranties or bonds.
- f. Provide copies of performance tests.

1.05 MANUAL FOR MATERIALS AND FINISHES

- a. Submit three copies of complete manual in final form.
- b. Content, for architectural products, applied materials and finishes:
 - 1. Manufacturer's data, giving full information on products.
 - a) Catalog number, size, composition.
 - b) Color and texture designations.

- 2. Information required for re-ordering special-manufactured products.
- 3. Instructions for care and maintenance:
 - a) Manufacturer's recommendation for types of cleaning agents and methods.
 - b) Cautions against cleaning agents and methods which are detrimental to the product.
 - c) Recommended schedule for cleaning and maintenance.
- c. Content, for moisture-protection and weather-exposed products:
 - 1. Manufacturer's data, giving full information on products.
 - a) Applicable standards.
 - b) Chemical composition.
 - c) Details of installation.
 - 2. Instructions for inspection, maintenance and repair.
- d. Additional requirements for maintenance data: As per respective Sections of Specifications.
- e. Provide complete information for finished products or surfaces specified in each Section.

1.06 MANUAL FOR EQUIPMENT AND SYSTEMS

- a. Submit three copies of complete manual in final form.
- b. Content, for each unit of equipment and system, as appropriate:
 - 1. Description of unit and component parts.
 - a) Function, normal operating characteristics, and limiting conditions.
 - b) Performance curves, engineering data and tests.
 - c) Complete nomenclature and commercial number of all replaceable parts.
 - 2. Operating procedures:
 - a) Start-up, break-in, routine and normal operating instructions.
 - b) Regulation, control, stopping, shutdown and emergency instructions.
 - c) Summer and winter operating instructions.
 - d) Special operating instructions.
 - 3. Maintenance procedures:
 - a) Routine operations.
 - b) Guide to 'trouble-shooting.
 - c) Disassembly, repair and reassembly.
 - d) Alignment, adjusting and checking.
 - e) Schedule for recommended service and preventive maintenance.
 - 4. Servicing and lubricating schedule.
 - a) List of lubricants required.

- 5. Manufacturer's printed operating and maintenance instructions.
- 6. Description of sequence of operation by control manufacturer.
- 7. Original manufacturer's parts list, illustrations, assembly drawings and diagrams required for maintenance.
 - a) Predicted life of parts subject to wear.
 - b) Items recommended to be stocked as spare parts.
- 8. As-installed control diagrams by controls manufacturer.
- 9. Each Contractor's coordination drawings.
 - a) As-installed color coded piping diagrams.
- 10. Charts of valve tag numbers, with the location and function of each valve.
- 11. List of original manufacturer's spare parts, manufacturer's current prices, and recommended quantities to be maintained in storage.
- 12. Other data as required under pertinent Specification Sections.
- c. Content, for each electrical and electronic system, as appropriate:
 - 1. Description of system and component parts.
 - a) Function, normal operating characteristics, and limiting conditions.
 - b) Performance curves, engineering data and tests.
 - c) Complete nomenclature and commercial number of replaceable parts.
 - 2. Circuit directories of panelboards.
 - a) Electrical service.
 - b) Controls.
 - c) Communications.
 - 3. As-installed color coded wiring diagrams.
 - 4. Operating procedures:
 - a) Routine and normal operating instructions.
 - b) Sequences required.
 - c) Special operating instructions.
 - 5. Maintenance procedures:
 - a) Routine operations.
 - b) Guide to 'Trouble-Shooting".
 - c) Disassembly, repair, and reassembly.
 - d) Adjustment and checking.
 - e) Schedule for preventive maintenance
 - 6. Manufacturer's printed operating and maintenance instructions.

- 7. List of original manufacturer's spare parts, manufacturer's current prices, and recommended quantities to be maintained in storage.
- 8. Other data as required under pertinent Specification Sections.
- d. Prepare and include additional data when the need for such data becomes apparent during instruction of Owner personnel.
- e. Additional requirements for operating and maintenance data: As per respective Specifications Sections.
- f. Provide complete information for operating products and equipment specified in each Section, including security hardware.

1.07 SUBMITTAL SCHEDULE

- a. Submit two copies of completed data in final form 30-days prior to the estimated date of Substantial Completion for the Owner's review, use by the inspectors, and training of Owner personnel. One copy will be returned after inspection for Substantial Completion with comments.
- b. Submit three copies of accepted data in final form 10-days after Final Inspection.

1.08 INSTRUCTION OF OWNER PERSONNEL

a. Prior to Owner's inspection for Substantial Completion, fully instruct Owner designated operating and maintenance personnel in the operation, adjustment and maintenance of all products installed.

END OF SECTION 01 78 09

SECTION 01 78 10 - WARRANTIES AND BONDS

1.01 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 Architect.

1.02 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. Submit within 10 days after Final Inspection.
- 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.

1.03 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 (next page) written on the Contractor's own letterhead. The guarantees/warranties shall commence on the Date of Substantial Completion of the Work by the Owner, unless specifically indicated otherwise. "Guarantee/Warranty for ______ under warranty identified by Specification Section)

Project:

Address:

Date:

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 ______years from the Date of Substantial Completion of the above named structure 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: _____

(Subcontractor)

Countersigned:

(Contractor)

Date:

Date:

1.04 CORRECTION OF GUARANTEED/WARRANTEED 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 warranteed 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 warranteed 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 warranteed 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, starling on date of acceptance of replaced or restored work.
- e. Except as otherwise indicated, costs of replacing or restoring failing warranteed units or products is Contractor's obligation, without regard for whether Owner has already benefitted 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.

END OF SECTION 01 78 10

SECTION 26 05 00

COMMON WORK RESULTS FOR ELECTRICAL WORK

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

A. <u>Work Included</u>: This Section specifies basic materials and methods for electrical work.

The following items are not included in this Section and will be performed under the designated Sections:

- 1. Determine interfaces and coordinate with work completed, progressing, or to be performed under other sections of these Specifications or by other contractors. Make indicated connections to previously completed work. Where future connections to or extensions of the work are indicated, make safe and convenient provisions for such future connections and extensions.
- 2. Where indicated, take possession of, maintain, and operate as required any electrical plant and equipment left in place by others. Where indicated, leave temporary and interim electrical work, plant and equipment in place for maintenance and operation by others.
- B. Refer to SECTION 34 77 39 ; TURNKEY BAGGAGE HANDLING SYSTEM PERFORMANCE SPECIFICATION for addition electrical work information and requirements.

1.2 REFERENCES

- A. Comply with applicable requirements of the following:
 - 1. National Electrical Code
 - 2. Client Standards
 - 3. All applicable federal, local and State Codes
 - 4. National Electrical Safety Code

1.3 SUBMITTALS

- A. Submit shop drawings for review showing fabricated work being furnished and installed under these Specifications. Submit such drawings prior to fabrication and within ample time to prevent delays in the work.
- B. Submit verified test results to the Engineer promptly upon completion of test.

- C. Before installation of the wire and cable, submit the following information for each type and size of wire and cable for review:
 - 1. Manufacturer of the wire and cable.
 - 2. Number and size of strands composing each conductor.
 - 3. Conductor insulation composition and thickness in mils.
 - 4. Average overall diameter of finished wire and cable.
 - 5. Minimum insulation resistance in megohms per 1,000 feet at 20°C ambient temperature.
 - 6. Jacket composition (if any) and thickness in mils.
 - 7. Total number of conductors per cable.
 - 8. Shield material (if any) and thickness.
 - 9. Conductor resistance and reactance in ohms per 1,000 feet at 20°C ambient temperature.
 - 10. Conductor ampacity at 20°C ambient temperature.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS

- A. Furnish all items of the materials, design, sizes, and ratings shown on the Contract Drawings and herein specified.
- B. Furnish materials and equipment bearing evidence of UL listing where UL standards exist and such product listing is available.
- C. Methods of fabrication, assembly and installation are optional unless otherwise specifically indicated.
- D. Provide products that are free from defects impairing performance, durability, or appearance, and of the commercial quality best suited for the purpose shown on the Contract Drawings or specified herein.
- E. Steel conduit and accessories specified to be zinc coated: Hot-dipped galvanized after fabrication in accordance with ASTM A286.
- F. Conform to applicable requirements of Insulation Cable Engineers' Association (ICEA).

2.2 RIGID GALVANIZED STEEL CONDUIT AND ACCESSORIES

A. Conduit, couplings, elbows, bends, and nipples: ANSI C80.1 and UL 6, with each length bearing manufacturer's stamp and UL label.

- B. Method used to determine the thickness of zinc coating: The Referenced Test included in the appendix to ANSI C80.1.
- C. Fittings and Accessories:
 - 1. Galvanized steel or malleable iron, ANSI C80.4.
 - 2. Provide separable watertight hub fittings with a gasket, separate nylon insulated throat and a case-hardened locknut.
 - 3. Bushings: Nylon insulated metallic and grounding type.
 - 4. Furnish conduit straps, clamps, and clamp backs made of galvanized malleable iron.
- D. All conduits penetrating floors and ceilings must have brass labels for ease of tracing circuits.
- E. All galvanized conduits passing through concrete shall have an anti-corrosion material added to the galvanized conduits.

2.3 TYPE EMT-S DUCT RACEWAYS AND ELBOWS

- A. Performance Criteria:
 - 1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction and marked for intended location and application.
 - 2. Listing Criteria: UL CCN FJMX; including UL 797.
- B. Source Quality Control:
 - 1. Product Data: Prepare and submit catalog cuts, brochures, and performance data illustrating size, physical appearance, and other characteristics of product.
 - 2. Manufacturer's Published Instructions: Prepare and submit installation, testing, and operating instructions for product.
- C. UL FJMX Steel Electrical Metal Tubing (EMT-S) and Elbows:
 - 1. Material: Steel.
 - 2. Options:
 - a. Exterior Coating: Zinc.
 - b. Interior Coating: Zinc with organic top coating.
 - c. Minimum Trade Size: trade size 3/4.
 - d. Colors: As indicated on Drawings.

2.4 LIQUID-TIGHT FLEXIBLE METALLIC CONDUIT AND FITTINGS

A. Furnish conduit consisting of a core of flexible galvanized steel with an extruded liquid-tight plastic or neoprene jacket overall. Jacket shall be moisture and oil-proof, capable of conforming to the minimum radius bends of flexible conduit without cracking.

- B. Furnish conduits with a continuous copper bonding conductor spiral wound between the convolutions, as required by NEC, and as indicated.
- C. Fittings: UL Standard 514, cadmium or zinc coated.

2.5 CONDUIT EXPANSION FITTINGS

- A. Fabricate from material similar to the type of conduit with which they are to be used.
- B. Include a factory installed packing ring, designed to prevent the entrance of moisture, and a pressure ring.
- C. Also include a grounding ring or a grounding conductor for metallic expansion couplings.

2.6 INSERTS

- A. Channel Inserts. Fabricate from not less than 12-gauge steel channel having an overall size of 1-1/2 by 1-1/2 or 1-5/8 by 1-5/8 inches with continuous 7/8-inch-wide slot, in lengths as indicated. Galvanize after fabrication.
- B. Channel Inserts for Embedding in Concrete
 - 1. Fabricate from channels having a solid base.
 - 2. Weld concrete anchors to the channel during fabrication and before coating.
 - 3. Galvanize after fabrication.
 - 4. Provide assemblies with a minimum pull-out load rating of 4,500 pounds per linear foot uniformly distributed.
 - 5. Furnish all channel inserts for installation embedded in concrete with the channel interior completely filled with Styrofoam to prevent seepage of concrete into the channel during installation.
- C. Channel Inserts for Surface Mounting
 - 1. Fabricate from channel having 3/8 inch by 3-inch slots on 4-inch centers in the base.
 - 2. Galvanize inserts for surface mounting on concrete surfaces or for installation in damp or wet areas.
- D. Spot Inserts for Embedding in Concrete
 - 1. Steel, galvanized after fabrication.
 - 2. Designed for a maximum loading of 800 pounds with safety factor of three.
 - 3. Knockout openings to accommodate either square or rectangular nuts.

2.7 SURFACE METAL RACEWAYS AND FITTINGS

A. ANSI/UL 5 and the NEC.

2.8 OUTLET, JUNCTION AND PULL BOXES

- A. Conform to NEC Article 370. Electrical boxes shall conform to UL-50, "Standard for Electrical Cabinets and Boxes", and UL-514, "Standard for Electrical Outlet Boxes and Fittings".
- B. Provide electrical boxes of the material, finish, type and size indicated and required for the location, kind of service, number of wires, and function. Boxes shall have mounting holes retapped for 10-24 machine screws.
- C. Provide boxes complete with accessible covers designed for quick removal and suitable for the purpose for which they will be used, except that boxes in which or on which no devices or fixtures are to be installed, shall be equipped with flat or raised blank covers as required. All ceiling fixture outlet boxes shall be equipped with 3/8-inch boltless fixture studs.
- D. All outdoor enclosures shall be NEMA 4X stainless steel with piano hinge and pad lockable latch.
- E. Covers: Same thickness as boxes and secured in position by means of No. 10-24 stainless steel machine screws. Arrange covers to be readily and conveniently removed.
- F. Coat junction boxes inside and outside to prevent oxidation. Where outlet boxes are used as junction boxes, they shall be cast aluminum and not be smaller than 4 inches square by 1-1/2 inches deep. Provide such boxes with flat blank covers.
- G. Outlet Boxes: Cast aluminum, not be smaller than 4 inches square by 2-1/8 inches deep.
- H. Concealed Switch Boxes: Stainless steel, not less than 4 inches square by 1-1/2 inches deep for two devices unless otherwise indicated. Provide covers with rectangular openings of proper size and shape. Furnish and install special boxes required to suit the kind of service and location requirements, as indicated, and as may be directed by the Engineer.
- I. Furnish brackets, supports, hangers, fittings, bonding jumpers and all other accessories required.
- J. Provide neoprene gaskets 1/8 inch thick with boxes subjected to weather, and as directed by the Engineer.
- K. Grounding. Provide each box to which a lighting fixture or receptacle is to be attached with a grounding terminal.
 - 1. Grounding Terminal: Either a green-colored washer-in-head machine screw not smaller than No. 10-32 in a drilled and tapped hole in the back of the box, or a grounding bushing with green-colored machine screw terminal attached to one of the conduits.
 - 2. Provide suitable grounding terminals in motor connection boxes.
- L. Junction and pull boxes must be surface mounted and not buried.

2.9 WIRING DEVICES

A. General. Wiring devices include switches, receptacles and special outlets installed in raceway or conduit boxes, complete with cover plates.

B. Switches

- 1. AC tumbler-toggle switches: Meeting minimum requirements of UL 20 and further requirements herein specified and of specification grade, heavy duty, of the type indicated.
- 2. Provide switches that operate in any position and are fully enclosed with entire body and cover of molded phenolic, urea or melamine. Do not use fiber, paper or similar insulating material for body or cover.
- 3. Equip switches with metal mounting yoke with plaster ears, insulated from the mechanism and fastened to the switch body by bolts, screws, rivets or other substantial means that meet test requirements.
- 4. Provide a green-colored equipment grounding screw on the yoke.
- 5. Provide the section of the yoke normally intended to bear on the surface outside the box with a minimum over-all dimension of 3/4 inch, measured at right angles to the longitudinal axis of the yoke.
- 6. Make switch contacts between silver or silver alloys.
- 7. Switches shall be back, and side wired with terminals of screw or combination screw-clamp type.
- 8. Terminal Screws: No. 8 or larger, captive, or terminal type.
- 9. Provide access holes for back wiring.
- 10. Wiring terminals capable of receiving and holding proper wire sizes as shown below:

Switch Rating	Wire Size, AWG No.	
20 amperes	12	
30 amperes	10	

- C. Wall switches: Tumbler type, totally enclosed, heavy duty, in accordance with NEMA WD 1.
- D. Switches for use on incandescent or fluorescent lighting circuits: Fully rated 20 amperes at 120 or 277 volts, as indicated. Actual connected lamp wattage not to exceed the following:

Switch Rating at 120-	Maximum Wattage Allowed
277 Volts	120 Volts 277 Volts
20 amperes	1,400 3,000

- E. Switches controlling outlets other than lighting, such as motors less than 1/4 horsepower may be specification grade, flush type, AC DC, T-rated 20 ampere, 125 volts. Switches controlling straight resistance loads may be snap switches as specified herein, of the proper rating up to 30 amperes at 120-277 volts.
- F. Provide ac 120–277-volt snap switches capable of withstanding tests as outlined in NEMA WD 1, Paragraphs WD 1-2.04, WD 1-2.05A, WD 1-2.05C, WD 1-2.05E2, WD 1-2.05F2, and WD 1-2.05G. If requested by the Engineer, submit satisfactory evidence that the types of switches proposed have satisfactorily withstood these tests.

2.10 RECEPTACLES AND PLUGS

- A. Configuration and requirements for connector and outlet receptacles; UL 498 and NEMA WD 1 for heavy duty general use type.
- B. Receptacles: Fire-resistant nonabsorptive, hot molded phenolic composition or equal bodies and bases with metal plaster ears integral with supporting member.
- C. Type: Flush type, except where otherwise indicated.
 - 1. Wall receptacles: Single or duplex as shown on the Contract Drawings.
 - 2. Provide receptacles and plugs (caps) with light-colored terminal facilities for neutral connections, amber or brass colored for phase conductor connections, and green-colored hexagonal machine screws for the equipment grounding conductor or connections.
 - 3. All contracts of the receptacles, including the grounding contract: Double grip bronze type with spring steel backup clips so that both sides of each male prong of the plug will be in firm contact.
 - 4. Provide all receptacles with self-grounding clip or mounting strap screws.
 - 5. Ground fault circuit interrupter duplex receptacles shall be 120-volt, 60 Hz, 15 ampere with built-in test, reset buttons, and ground fault tripped indication. They shall interrupt the circuit within 1/30th of a second on a 5 milliampere earth leakage current. They shall be designed for end of run installation or with provisions for feeding through to protect other outlets on the circuit. Maximum circuit capacity for the latter shall be 20 amperes. The receptacles shall be furnished with necessary wire connectors, clips, mounting scores and instruction.

2.11 COVER PLATES

- A. Provide cover plates for each switch, receptacle, and special purpose outlet.
- B. Use multi-gang plates for multi-gang boxes.

- C. Unless otherwise indicated, use cover plates conforming to FS W-P-455.
- D. Provide and install cover plates of brushed stainless steel in ancillary spaces, mechanical rooms, fan rooms, wire closets, AC switchboard rooms, traction substations, and all unfinished areas.
- E. In public areas provide cover plates fabricated of corrosion-resistant steel, 18% chromium, 8% nickel with baked porcelain enamel bronze finish.
- F. For special purpose outlets commercially produced using special material, configuration, and size, use plate of brushed stainless steel and of a design for the particular application.
- G. Where plates of material and finish herein specified are not available commercially for these special purpose outlets, plates commercially available and suitable for enameling to match adjacent surface will be acceptable.
- H. Use stainless steel cover plates of 0.040 thickness for flush devices.

PART 3 - EXECUTION

3.1 GENERAL

- A. Install all items in their proper locations as shown on the Contract Drawings, rigid and secure, plumb and level, and in true alignment with related and adjoining work. Do not weld electrical materials for attachment or support.
- B. Furnish anchor bolts and anchorage items as required, and field check to ensure proper alignment and location. Provide templates, layout drawings, and supervision at the job site to ensure correct placing of anchorage items in concrete. Check embedded items for correctness of location and detail before concrete is placed.
- C. Install supporting members, fastenings, framing, hangers, bracing, brackets, straps, bolts and angles as required to set and connect rigidly the work.
- D. Control erection tolerance requirements to not impair the strength, safety, serviceability, or appearance of the installations, as approved by the Engineer. Determine exact location of conduit. Route all conduit parallel to building lines.
- E. The trade size, type and general routing and location of conduits, raceways, and boxes shall be as indicated.
- F. Install exposed conduit so as to avoid conflicts with other work. Install horizontal raceway close to the ceiling or ceiling beams, and above water or other piping whenever possible.
- G. Install individual conductors in conduits, raceways, cable trays, ducts, and trenches and multiple-conductor sheathed cables as shown on the Contract Drawings to complete the wiring systems.
- H. Install switches, receptacles, special purpose outlets, and cover plates complete in a neat manner in accordance with the NEC and local electrical codes.

I.All entry into outdoor enclosures shall utilize weather tight connectors to prevent the entry of water. Wherever possible do not enter the top of enclosures.

3.2 CONDUIT AND FITTINGS

- A. Metallic Electrical Conduit
 - 1. Install metallic conduit in accordance with the NEC and as indicated. Prevent concrete and other materials from obstructing the conduit. Pack all outlet, pull and junction boxes with paper prior to pouring concrete ends of embedded conduit. Do not use conduit smaller than 3/4-inch diameter.
 - 2. Make all conduit bends in accordance with the NEC, with not more than 3 bends per run (a total of 270 degrees). Where more than 3 bends are required in a particular run, install pull boxes as required to facilitate pulling conductors.
 - 3. Unless otherwise indicated, terminate metallic conduit installed for future extension with flush couplings set to finished floor level.
 - 4. Provide metallic numbering tags indicating the conduit number on the end of conduit. Identify train control and communication conduit as indicated.
 - 5. Install conduit so that any moisture collecting in the conduit will be drained to the nearest outlet or pull box.
 - 6. Whenever exposed or buried conduit passes through an expansion or contraction joint in the structure, install the conduit at right angles to the joint, and provide an approved conduit expansion joint at the joint. Paint the conduit with an approved bituminous compound for one foot on each side of the expansion couplings.
 - 7. Provide expansion joints in conduit runs where required to compensate for thermal expansion or other movement.
 - 8. Rod and swab conduit after installation to remove foreign matter, which may have worked in at the joints. If obstructions are encountered which cannot be removed, or if any conditions exist which may result in damage to wires and cables pulled through the conduit, install new conduit at no additional expense to the owner.
 - 9. After the conduit has been rodded and swabbed, repack boxes and protect conduit ends to prevent any foreign material from entering the conduit.
 - 10. Where metallic conduit is exposed to different temperatures, seal the conduit to prevent condensation and passage of air from one area to the other.
 - 11. Use only conduits that are electrically and mechanically continuous and connect to the structure ground system. Secure continuous ground by bonding where required.
 - 12. Apply conductive anti-seize compound to the threads of threaded rigid conduit joints. Do not use compounds containing lead. Terminate the conduit in appropriate boxes at all motors, switches, outlets, and junction points.

- 13. When field cutting of conduit is required, thread and ream the conduit to remove any rough edges. Where a conduit enters a box or other fitting, provide a bushing to protect the wire from abrasion. Provide insulation type bushings and double locknuts on ends of rigid conduits terminating at steel boxes, panelboards, cabinets, motor starting equipment, and similar enclosures.
- 14. Support individual horizontal conduits not larger than 1-1/2 inches diameter by means of one-hole pipe straps with back spacers or individual pipe hangers.
- 15. Space conduits installed against concrete surfaces away from the surface by clamp backs or other approved means.
- 16. Support parallel conduits at the same elevation on multiple conduit hangers or channel inserts. Secure each conduit to the pipe hanger or channel insert member by a U-bolt, one-hole strap, or other specially designed and approved fastener suitable for use with the pipe hangers or channel inserts.
- 17. Space supports not over 10 feet on centers for vertical conduits spanning open areas. Securely anchor conduit at each end and run so as not to interfere with the installation and operation of equipment at the location.
- 18. Support conduits and raceways above suspended ceilings from either the floor construction above or from the main ceiling support members, using the applicable method specified herein.
- 19. Install liquid-tight flexible metal conduit so that liquids tend to run off the surface and not drain toward fittings. Provide sufficient slack to reduce the effects of vibration. Running threads are not acceptable. Where necessary for connecting conduits, use right- and left-hand couplings.
- B. Non-Metallic Electrical Conduit
 - 1. Properly support conduits to maintain the correct location and spacing during concreting operations and, if necessary, provide suitable plastic supports and spacers for this purpose.
- C. Pull Wires
 - 1. Use nylon pull wires of tensile strength not less than 240 pounds in each conduit and duct, leave pull wires in ducts and conduit after cleaning.
 - 2. No splices in pull wire will be allowed.
 - 3. Leave ample slack length at each end of pull wire.
- D. Filling of Openings. Wherever slots, sleeves, or other openings are provided in floors or walls for the passage of raceways, including bus ducts, fill such openings as follows:
 - 1. Use fire-resistive filling material for openings similar to the material of the floor, wall or ceiling being penetrated, and finish to prevent passage of water, smoke, and fumes.
 - 2. Where conduits passing through openings are exposed in finished rooms, use filling material that matches, and is flush with, the adjoining finished floor, ceiling or wall.

3.3 INSERTS

- A. Channel Inserts. Install embedded channel inserts with the slotted face flush with the finished concrete surface.
- B. Spot Inserts
 - 1. Install with the insert face flush with the finished building surface, firmly embedded, with no evidence of movement.
 - 2. All floor and wall penetrations shall utilize fire retardant materials in order to maintain the fire rating of the surface being penetrated.
 - 3. Test selected inserts, as required by the Engineer, by suspension of 800 pounds of weight from the insert. If there is evidence of failure, replace the inserts in a manner satisfactory to the Engineer.

3.4 SURFACE METAL RACEWAYS

- A. Securely ground surface metal raceways to outlet boxes or to backplates and fixtures by means of bolts, screws, or other approved means.
- B. Install surface metal raceways where indicated, in accordance with the NEC. Use fittings and accessories designed for the raceway.

3.5 OUTLET, JUNCTION AND PULL BOXES

- A. Outlet Boxes
 - 1. Unless otherwise indicated, flush mount outlet boxes with the front edges of the boxes or plaster covers attached thereto flush with the finished wall or ceiling.
 - 2. Mount boxes so that the long axis of the devices will be vertical, unless otherwise indicated.
 - 3. Locate conduit boxes and conduit box knockouts so as not to interfere with the reinforcing steel.
 - 4. Unless otherwise specified, provide boxes in plastered walls and ceilings with plaster covers. Do not install these covers until the finish plaster line is determined for the particular location.
 - 5. The mounting height indicated for a wall-mounted outlet box shall be construed to mean the height from the finished floor to the horizontal centerline of the cover plate.
 - 6. Mount outlet boxes for switches and receptacles located on columns and pilasters so as not to interfere with installation of partitions.
 - 7. Install boxes located near doors on the lock sides, even where the symbols appear on the hinge sides on the Contract Drawings, unless other locations are approved by the Engineer.

B. Junction and Pull Boxes

- 1. Install so that covers are readily accessible after completion of the installation.
- 2. Do not install boxes above suspended ceilings, except where the ceiling is of the removable type or where definite provisions are made for access to each box.

3.6 WIRING

- A. General
 - 1. Furnish wires and cables to the site in unbroken standard coils or reels, to which shall be attached a tag bearing the manufacturer's name, trade name of the wire, and the UL label for 600-volt wire and cable.
 - 2. Provide all wiring complete as indicated. Provide ample slack wire for motor loops, service connections and extensions. In outlet or junction boxes provided for installation of equipment by others, tape ends of wires and install blank covers.
 - 3. Do not bend cables during installation, either permanently or temporarily, to radii less than 12 times the outer diameters, except where conditions make the specified radius impracticable, and shorter radii are permitted by the NEC and NEMA Standard WC 7, Appendix N.
 - 4. Neatly and securely bundle cable conductors located in branch circuit panelboards, cabinets, control boards, switchboards and motor control centers and pull boxes. Use nylon bundling straps.
- B. Wire Pulling
 - 1. Install wire and cable in conduit as indicated. Do not pull wiring into any conduit until conduits and outlets have been thoroughly cleaned and swabbed to remove water and debris. Do not use block or tackle or other mechanical means in pulling conductors smaller than No. 2 AWG in raceways.
 - 2. Provide suitable installation equipment to prevent cutting and abrasion of conduits and wire during the pulling of feeders. Use lubricant and installation procedure as recommended by the cable manufacturer, and as approved by the Engineer.
 - 3. Use masking or other means to prevent obliteration of cable identifications when solid color coating or colored tracers are used.
 - 4. Pull together all cables to be installed in a single conduit.
- C. Cable Supports. Install cable supports for vertical feeders in accordance with the NEC.
- D. Splices and Terminations
 - 1. Make wire and cable splices only in outlet, junction or pull boxes, or in equipment cabinets. Splices in conduit or raceway will not be permitted. Make splices by means of compression type connectors, and cover with tape to an insulation level equal to that of the cable.

- 2. Use positive type connector installation tools as recommended by the manufacturer.
- 3. Mechanical hand tools, with dies for each conductor size, recommended by the manufacturer, may be used on conductor sizes through No. 4/0.
- 4. For conductor sizes larger than No. 4/0, use hydraulic tools with hexagonal or circumferential installing dies for each conductor size, as recommended by the manufacturer.
- 5. For inspection purposes, clearly mark die numbers on the installed connectors.
- 6. Before installation, apply anti-corrosion electrical joint compound to conductors and terminal bolting pads.

3.7 WIRING DEVICES

- A. Locate switches four feet above finished floor, except as otherwise indicated.
- B. Attach receptacles rigidly to outlet box by means of two screws.
- C. Wire duplex receptacles, where so indicated, so that one unit of the duplex may be controlled by a wall switch and the other unit remain continuously energized.
- D. For exterior locations, mount receptacles in watertight cast type outlet boxes with threaded hubs or bosses and equipped with gasketed cover and captive cap of the screw or twist type.
- E. Provide equipment permanently connected to exterior receptacles, or in areas subject to spray or hose cleaning, with watertight male plugs to suit. Such receptacles shall be of the ground fault circuit interrupter type, as specified herein.
- F. Furnish one matching plug with each receptacle, as indicated, installed in the work.

END OF SECTION 26 05 00
SECTION 26 05 19

CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Copper building wire rated 600 V or less.
 - 2. Connectors, splices, and terminations rated 600 V and less.
- B. Refer to SECTION 34 77 39 ; TURNKEY BAGGAGE HANDLING SYSTEM PERFORMANCE SPECIFICATION for addition electrical work information and requirements.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Product Schedule: Indicate type, use, location, and termination locations.

1.3 INFORMATIONAL SUBMITTALS

A. Field quality-control reports.

PART 2 - PRODUCTS

2.1 COPPER BUILDING WIRE

- A. Description: Flexible, insulated, and uninsulated, drawn copper current-carrying conductor with an overall insulation layer or jacket, or both, rated 600 V or less.
- B. Standards:
 - 1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
 - 2. Conductor and Cable Marking: Comply with wire and cable marking according to UL's "Wire and Cable Marking and Application Guide."
- C. Conductors: Copper, complying with ASTM B3 for bare annealed copper and with ASTM B8 or ASTM B496 for stranded conductors.
- D. Conductor Insulation:

- 1. Type NM: Comply with UL 83 and UL 719.
- 2. Type RHH and Type RHW-2: Comply with UL 44.
- 3. Type THHN and Type THWN-2: Comply with UL 83.
- 4. Type THW and Type THW-2: Comply with NEMA WC-70/ICEA S-95-658 and UL 83.
- 5. Type XHHW-2: Comply with UL 44.

2.2 CONNECTORS AND SPLICES

- A. Description: Factory-fabricated connectors, splices, and lugs of size, ampacity rating, material, type, and class for application and service indicated; listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
- B. Lugs: One piece, seamless, designed to terminate conductors specified in this Section.
 - 1. Material: Copper.
 - 2. Type: One or Two hole with standard barrels.
 - 3. Termination: Compression.

2.3 CATEGORY 6 BALANCED TWISTED PAIR CABLE

- A. Description: Four-pair, balanced-twisted pair cable, certified to meet transmission characteristics of Category 6 cable at frequencies up to 250 MHz.
- B. Standard: Comply with ICEA S-90-661, NEMA WC 63.1, and TIA-568-C.2 for Category 6 cables.
- C. Conductors: 100-ohm, No. 24 AWG solid copper.
- D. Shielding/Screening: Unshielded twisted pairs (UTP), Shielded twisted pairs (FTP)] Screened twisted pairs (F/UTP), Screened and shielded twisted pairs (F/FTP).
- E. Cable Rating: Plenum.
- F. Jacket: Gray thermoplastic.

PART 3 - EXECUTION

3.1 CONDUCTOR MATERIAL APPLICATIONS

- A. Feeders:
 - 1. Copper; solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.
 - 2. Copper for feeders smaller than No. 4 AWG; copper for feeders No. 4 AWG and larger. Conductors must be solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.
- B. Branch Circuits:

- 1. Copper, Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.
- 2. Copper, Solid for No. 12 AWG and smaller; stranded for No. 10 AWG and larger.

3.2 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

- A. Exposed Feeders: Type THHN/THWN-2, single conductors in raceway
- B. Feeders Concealed in Ceilings, Walls, Partitions, and Crawlspaces: Type THHN/THWN-2, single conductors in raceway.
- C. Branch Circuits Concealed in Ceilings, Walls, and Partitions: Type THHN/THWN-2, single conductors in raceway.

3.3 INSTALLATION OF CONDUCTORS AND CABLES

- A. Conceal cables in finished walls, ceilings, and floors unless otherwise indicated.
- B. Complete raceway installation between conductor and cable termination points according to Section 260533 "Raceways and Boxes" prior to pulling conductors and cables.
- C. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
- D. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.
- E. Install exposed cables parallel and perpendicular to surfaces of exposed structural members and follow surface contours where possible.
- F. Support cables according to Section 260529 "Hangers and Supports."

3.4 IDENTIFICATION

A. Identify each spare conductor at each end with identity number and location of other end of conductor and identify as spare conductor.

3.5 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Section 260544 "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."

END OF SECTION 26 05 19

SECTION 26 05 26

GROUNDING AND BONDING

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes methods and materials for grounding systems and equipment.
- B. Refer to SECTION 34 77 39 ; TURNKEY BAGGAGE HANDLING SYSTEM PERFORMANCE SPECIFICATION for addition electrical work information and requirements.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Field quality-control test reports.

1.3 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Comply with UL 467 for grounding and bonding materials and equipment.

PART 2 - PRODUCTS

2.1 CONDUCTORS

- A. Insulated Conductors: Copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.
- B. Bare Copper Conductors:
 - 1. Solid Conductors: ASTM B 3.
 - 2. Stranded Conductors: ASTM B 8.
 - 3. Bonding Cable: 28 kcmil, 14 strands of No. 17 AWG conductor, 1/4 inch in diameter.
 - 4. Bonding Conductor: No. 4 or No. 6 AWG, stranded conductor.

5. Bonding Jumper: Copper tape, braided conductors, terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.

2.2 CONNECTORS

- A. Listed and labeled by a nationally recognized testing laboratory acceptable to authorities having jurisdiction for applications in which used, and for specific types, sizes, and combinations of conductors and other items connected.
- B. Bolted Connectors for Conductors and Pipes: Copper or copper alloy, bolted pressure-type, with at least two bolts.
 - 1. Pipe Connectors: Clamp type, sized for pipe.
- C. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.

PART 3 - EXECUTION

3.1 APPLICATIONS

- A. Conductors: Install solid conductor for No. 8 AWG and smaller, and stranded conductors for No. 6 AWG and larger, unless otherwise indicated.
- B. Conductor Terminations and Connections:
 - 1. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors.
 - 2. Connections to Structural Steel: Welded connectors.

3.2 EQUIPMENT GROUNDING

- A. Install insulated equipment grounding conductors with the following items, in addition to those required by NFPA 70:
 - 1. Feeders and branch circuits.
 - 2. Lighting circuits.
 - 3. Receptacle circuits.
 - 4. Single-phase motor and appliance branch circuits.
 - 5. Three-phase motor and appliance branch circuits.
 - 6. Flexible raceway runs.
 - 7. Metal-clad cable runs.

3.3 INSTALLATION

- A. Grounding Conductors: Route along shortest and straightest paths possible, unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.
- B. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance, except where routed through short lengths of conduit.
 - 1. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.
 - 2. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install so vibration is not transmitted to rigidly mounted equipment.
 - 3. Use exothermic-welded connectors for outdoor locations, but if a disconnect-type connection is required, use a bolted clamp.

3.4 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections and prepare test reports:
 - 1. After installing grounding system but before permanent electrical circuits have been energized, test for compliance with requirements.
 - 2. Test completed grounding system at each location where a maximum ground-resistance level is specified, at service disconnect enclosure grounding terminal.
 - a. Measure ground resistance not less than two full days after last trace of precipitation and without soil being moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance.
 - b. Perform tests by fall-of-potential method according to IEEE 81.
- B. Excessive Ground Resistance: If resistance to ground exceeds specified values, notify Architect promptly and include recommendations to reduce ground resistance.

END OF SECTION 26 05 26

SECTION 26 05 29

HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes:
 - 1. Hangers and supports for electrical equipment and systems.
 - 2. Construction requirements for concrete bases.
- B. Refer to SECTION 34 77 39 ; TURNKEY BAGGAGE HANDLING SYSTEM PERFORMANCE SPECIFICATION for addition electrical work information and requirements.

1.2 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Design supports for multiple raceways, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
- B. Design supports for multiple raceways capable of supporting combined weight of supported systems and its contents.
- C. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.
- D. Rated Strength: Adequate in tension, shear, and pullout force to resist maximum loads calculated or imposed for this Project, with a minimum structural safety factor of five times the applied force.

1.3 SUBMITTALS

- A. Product Data: For steel slotted support systems.
- B. Shop Drawings: Show fabrication and installation details and include calculations for the following:
 - 1. Trapeze hangers. Include Product Data for components.
 - 2. Steel slotted channel systems. Include Product Data for components.
 - 3. Equipment supports.
- C. Welding certificates.

1.4 QUALITY ASSURANCE

- A. Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code Steel."
- B. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

- A. Steel Slotted Support Systems: Comply with MFMA-4, factory-fabricated components for field assembly.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Allied Tube & Conduit.
 - b. Cooper B-Line, Inc.; a division of Cooper Industries.
 - c. ERICO International Corporation.
 - d. GS Metals Corp.
 - e. Thomas & Betts Corporation.
 - f. Unistrut; Tyco International, Ltd.
 - g. Wesanco, Inc.
 - 2. Metallic Coatings: Hot-dip galvanized after fabrication and applied according to MFMA-4.
 - 3. Nonmetallic Coatings: Manufacturer's standard PVC, polyurethane, or polyester coating applied according to MFMA-4.
 - 4. Channel Dimensions: Selected for applicable load criteria.
- B. Raceway and Cable Supports: As described in NECA 1 and NECA 101.
- C. Conduit and Cable Support Devices: Steel hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.
- D. Structural Steel for Fabricated Supports and Restraints: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.
- E. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:

- 1. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened Portland cement concrete, steel, or wood, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.
 - a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1) Hilti Inc.
 - 2) ITW Ramset/Red Head; a division of Illinois Tool Works, Inc.
 - 3) MKT Fastening, LLC.
 - 4) Simpson Strong-Tie Co., Inc.; Masterset Fastening Systems Unit.
- 2. Mechanical-Expansion Anchors: Insert-wedge-type, zinc-coated steel, for use in hardened Portland cement concrete with tension, shear, and pullout capacities appropriate for supported loads and building materials in which used.
 - a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1) Cooper B-Line, Inc.; a division of Cooper Industries.
 - 2) Empire Tool and Manufacturing Co., Inc.
 - 3) Hilti Inc.
 - 4) ITW Ramset/Red Head; a division of Illinois Tool Works, Inc.
 - 5) MKT Fastening, LLC.
- 3. Concrete Inserts: Steel or malleable-iron, slotted support system units similar to MSS Type 18; complying with MFMA-4 or MSS SP-58.
- 4. Clamps for Attachment to Steel Structural Elements: MSS SP-58, type suitable for attached structural element.
- 5. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM A 325.
- 6. Toggle Bolts: All-steel springhead type.
- 7. Hanger Rods: Threaded steel.

2.2 FABRICATED METAL EQUIPMENT SUPPORT ASSEMBLIES

A. Description: Welded or bolted, structural-steel shapes, shop or field fabricated to fit dimensions of supported equipment.

PART 3 - EXECUTION

3.1 APPLICATION

- A. Comply with NECA 1 and NECA 101 for application of hangers and supports for electrical equipment and systems except if requirements in this Section are stricter.
- B. Maximum Support Spacing and Minimum Hanger Rod Size for Raceway: Space supports for EMT, IMC, and RMC as required by NFPA 70. Minimum rod size shall be 3/8" inch in diameter.
- C. Multiple Raceways or Cables: Install trapeze-type supports fabricated with steel slotted or other support system, sized so capacity can be increased by at least 25 percent in future without exceeding specified design load limits.
 - 1. Secure raceways and cables to these supports with single-bolt conduit clamps.
- D. Spring-steel clamps designed for supporting single conduits without bolts may be used for 1-1/2-inch and smaller raceways serving branch circuits and communication systems above suspended ceilings and for fastening raceways to trapeze supports.

3.2 SUPPORT INSTALLATION

- A. Comply with NECA 1 and NECA 101 for installation requirements except as specified in this Article.
- B. Raceway Support Methods: In addition to methods described in NECA 1, EMT, IMC, and RMC may be supported by openings through structure members, as permitted in NFPA 70.
- C. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb.
- D. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise indicated by code:
 - 1. To Wood: Fasten with lag screws or through bolts.
 - 2. To New Concrete: Bolt to concrete inserts.
 - 3. To Masonry: Approved toggle-type bolts on hollow masonry units and expansion anchor fasteners on solid masonry units.
 - 4. To Existing Concrete: Expansion anchor fasteners.
 - 5. Instead of expansion anchors, powder-actuated driven threaded studs provided with lock washers and nuts may be used in existing standard-weight concrete 4 inches thick or

greater. Do not use for anchorage to lightweight-aggregate concrete or for slabs less than 4 inches thick.

- 6. To Steel: Beam clamps (MSS Type 19, 21, 23, 25, or 27) complying with MSS SP-69.
- 7. To Light Steel: Sheet metal screws.
- 8. Items Mounted on Hollow Walls and Nonstructural Building Surfaces: Mount cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices on slotted-channel racks attached to substrate by means that meet seismic-restraint strength and anchorage requirements.
- E. Drill holes for expansion anchors in concrete at locations and to depths that avoid reinforcing bars.

3.3 INSTALLATION OF FABRICATED METAL SUPPORTS

- A. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor electrical materials and equipment.
- B. Field Welding: Comply with AWS D1.1/D1.1M.

3.4 PAINTING

- A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.
 - 1. Apply paint by brush or spray to provide minimum dry film thickness of 2.0 mils.
- B. Touchup: Comply with requirements in Division 9 painting Sections for cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint on miscellaneous metal.
- C. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

END OF SECTION 26 05 29

SECTION 26 05 33

RACEWAYS AND BOXES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes raceways, fittings, boxes, enclosures, and cabinets for electrical wiring.
- B. Refer to SECTION 34 77 39 ; TURNKEY BAGGAGE HANDLING SYSTEM PERFORMANCE SPECIFICATION for addition electrical work information and requirements.

1.2 SUBMITTALS

- A. Product Data: For surface raceways, wireways and fittings, floor boxes, hinged-cover enclosures, and cabinets.
- B. Shop Drawings: For custom enclosures and cabinets. Include plans, elevations, sections, details, and attachments to other work.

1.3 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 METAL CONDUIT AND TUBING

- A. Rigid Steel Conduit: ANSI C80.1.
- B. IMC: ANSI C80.6.
- C. EMT: ANSI C80.3.
- D. FMC: Zinc-coated steel.
- E. LFMC: Flexible steel conduit with PVC jacket.

- F. Fittings for Conduit (Including all Types and Flexible and Liquidtight), EMT, and Cable: NEMA FB 1; listed for type and size raceway with which used, and for application and environment in which installed.
 - 1. Conduit Fittings for Hazardous (Classified) Locations: Comply with UL 886.
 - 2. Fittings for EMT: Steel, compression type.

2.2 METAL WIREWAYS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Cooper B-Line, Inc.
 - 2. Hoffman.
 - 3. Square D; Schneider Electric.
- B. Description: Sheet metal sized and shaped as indicated, NEMA 250, Type 1, unless otherwise indicated.
- C. Fittings and Accessories: Include couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings to match and mate with wireways as required for complete system.
- D. Wireway Covers: Screw-cover type.
- E. Finish: Manufacturer's standard enamel finish.

2.3 SURFACE RACEWAYS

- A. Surface Metal Raceways: Galvanized steel with Snap-On covers. Manufacturer's standard enamel finish.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Thomas & Betts Corporation.
 - b. Walker Systems, Inc.; Wiremold Company (The).
 - c. Wiremold Company (The); Electrical Sales Division.

2.4 BOXES, ENCLOSURES, AND CABINETS

A. Cast-Metal Outlet and Device Boxes: NEMA FB 1, ferrous alloy, Type FD, with gasketed cover.

- B. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.
- C. Hinged-Cover Enclosures: NEMA 250, Type 1, and NEMA 4X Stainless Steel, with continuous-hinge cover with flush latch, unless otherwise indicated. All NEMA 4X enclosures shall be lockable.
- D. Cabinets:
 - 1. NEMA 4X, stainless steel box with removable interior panel and removable front.
 - 2. Hinged door in front cover with flush latch and concealed hinge.
 - 3. Key latch to match panelboards.
 - 4. Metal barriers to separate wiring of different systems and voltage.
 - 5. Accessory feet where required for freestanding equipment.

PART 3 - EXECUTION

3.1 RACEWAY APPLICATION

- A. Comply with the following indoor applications, unless otherwise indicated:
 - 1. Exposed: Rigid steel conduit.
 - 2. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): FMC, except use LFMC in damp or wet locations.
 - 3. Damp or Wet Locations: Rigid steel conduit.
 - 4. Boxes and Enclosures: NEMA 250, Type 1, except use NEMA 250, Type 4X, stainless steel in damp or wet locations.
- B. Minimum Raceway Size: 3/4-inch trade size.
- C. Raceway Fittings: Compatible with raceways and suitable for use and location.
 - 1. Rigid and Intermediate Steel Conduit: Use threaded rigid steel conduit fittings, unless otherwise indicated.

3.2 INSTALLATION

- A. Comply with NECA 1 for installation requirements applicable to products specified in Part 2 except where requirements on Drawings or in this Article are stricter.
- B. Keep raceways at least 6 inches away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.

- C. Complete raceway installation before starting conductor installation.
- D. Arrange stub-ups so curved portions of bends are not visible above the finished slab.
- E. Install no more than the equivalent of three 90-degree bends in any conduit run except for communications conduits, for which fewer bends are allowed.
- F. Conceal conduit within finished walls, ceilings, and floors, unless otherwise indicated.
- G. Raceways Embedded in Slabs:
 - 1. Run conduit larger than 1-inch trade size, parallel or at right angles to main reinforcement. Where at right angles to reinforcement, place conduit close to slab support.
 - 2. Arrange raceways to cross building expansion joints at right angles with expansion fittings.
 - 3. Change from ENT to RNC, Type EPC-40-PVC, rigid steel conduit, or IMC before rising above the floor.
- H. Raceway Terminations at Locations Subject to Moisture or Vibration: Use insulating bushings to protect conductors, including conductors smaller than No. 4 AWG.
- I. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb tensile strength. Leave at least 12 inches of slack at each end of pull wire.
- J. Install raceway sealing fittings at suitable, approved, and accessible locations and fill them with listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings at the following points:
 - 1. Where conduits pass from warm to cold locations., such as boundaries of refrigerated spaces.
 - 2. Where otherwise required by NFPA 70.
- K. Flexible Conduit Connections: Use maximum of 72 inches of flexible conduit for equipment subject to vibration, noise transmission, or movement; and for transformers and motors.
 - 1. Use LFMC in damp or wet locations subject to severe physical damage.
- L. Recessed Boxes in Masonry Walls: Saw-cut opening for box in center of cell of masonry block and install box flush with surface of wall.

3.3 FIRESTOPPING

A. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly.

END OF SECTION 26 05 33

SECTION 26 05 44 SLEEVES AND SLEEVE SEALS FOR ELECTRICAL WORK

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Sleeves.
 - 2. Stack-sleeve fittings.
 - 3. Sleeve-seal systems.
 - 4. Sleeve-seal fittings.
 - 5. Grout.
 - 6. Silicone sealants.
- B. Refer to SECTION 34 77 39 ; TURNKEY BAGGAGE HANDLING SYSTEM PERFORMANCE SPECIFICATION for addition electrical work information and requirements.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.1 SLEEVES

- A. Cast-Iron Pipe Sleeves: Cast or fabricated of cast or ductile iron and equivalent to ductile-iron pressure pipe, with plain ends and integral water stop collar.
- B. Steel Pipe Sleeves: ASTM A53/A53M, Type E, Grade B, Schedule 40, anti-corrosion coated or zinc coated, with plain ends and integral welded water stop collar.
- C. Galvanized-Steel Sheet Sleeves: 0.0239-inch minimum thickness; round tube closed with welded longitudinal joint.

2.2 SLEEVE-SEAL SYSTEMS

- A. Description:
 - 1. Modular sealing-element unit, designed for field assembly, for filling annular space between conduit and sleeve.
 - 2. Designed to form a hydrostatic seal of 20-psig.

- 3. Sealing Elements: EPDM-rubber interlocking links shaped to fit surface of conduit. Include type and number required for pipe material and size.
- 4. Pressure Plates: Carbon steel.
- 5. Connecting Bolts and Nuts: Carbon steel, with corrosion-resistant coating, ASTM B633 of length required to secure pressure plates to sealing elements.

2.3 GROUT

- A. Description: Non-shrink, recommended for interior and exterior sealing openings in non-firerated walls or floors.
- B. Standard: ASTM C1107/C1107M, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.
- C. Design Mix: 5000-psi, 28-day compressive strength.
- D. Packaging: Premixed and factory packaged.

PART 3 - EXECUTION

3.1 SLEEVE INSTALLATION

- A. Install sleeves for conduits passing through penetrations in floors, partitions, roofs, and walls.
- B. For sleeves that will have sleeve-seal system installed, select sleeves of size large enough to provide 1-inch annular clear space between piping and concrete slabs and walls.
- C. Install sleeves for conduits passing through interior partitions.
 - 1. Cut sleeves to length for mounting flush with both surfaces.
 - 2. Install sleeves that are large enough to provide 1/4-inch annular clear space between sleeve and conduit insulation.
 - 3. Seal annular space between sleeve and conduit insulation; use sealants appropriate for size, depth, and location of joint.
- D. Fire-Resistance-Rated Penetrations, Horizontal Assembly Penetrations, and Smoke-Barrier Penetrations: Maintain indicated fire or smoke rating of walls, partitions, ceilings, and floors at conduit penetrations. Seal conduit penetrations with fire- and smoke-stop materials.

3.2 SLEEVE-SEAL-SYSTEM INSTALLATION

- A. Install sleeve-seal systems in sleeves in exterior concrete walls and slabs-on-grade at conduit entries into building.
- B. Select type, size, and number of sealing elements required for material and size and for sleeve ID or hole size. Position conduit in center of sleeve. Center conduit in penetration, assemble sleeve-seal-system components, and install in annular space between conduit and sleeve.

Tighten bolts against pressure plates that cause sealing elements to expand and make a watertight seal.

END OF SECTION 26 05 44

SECTION 26 28 16

ENCLOSED SWITCHES AND CIRCUIT BREAKERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Fusible switches.
 - 2. Non-fusible switches.
 - 3. Receptacle switches.
 - 4. Shunt trip switches.
 - 5. Molded-case circuit breakers (MCCBs).
 - 6. Molded-case switches.
 - 7. Enclosures.
- B. Refer to SECTION 34 77 39 ; TURNKEY BAGGAGE HANDLING SYSTEM PERFORMANCE SPECIFICATION for addition electrical work information and requirements.

1.3 DEFINITIONS

- A. NC: Normally closed.
- B. NO: Normally open.
- C. SPDT: Single pole, double throw.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of enclosed switch, circuit breaker, accessory, and component indicated. Include nameplate ratings, dimensioned elevations, sections, weights, and manufacturers' technical data on features, performance, electrical characteristics, ratings, accessories, and finishes.

- 1. Enclosure types and details for types other than NEMA 250, Type 1.
- 2. Current and voltage ratings.
- 3. Short-circuit current ratings (interrupting and withstand, as appropriate).
- 4. Detail features, characteristics, ratings, and factory settings of individual overcurrent protective devices, accessories, and auxiliary components.
- B. Shop Drawings: For enclosed switches and circuit breakers.
 - 1. Include plans, elevations, sections, details, and attachments to other work.
 - 2. Include wiring diagrams for power, signal, and control wiring.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified testing agency.
- B. Seismic Qualification Data: Certificates, for enclosed switches and circuit breakers, accessories, and components, from manufacturer.
 - 1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
 - 2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
 - 3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.

1.6 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Circuit breakers and fuses: Equal to 25 percent of quantity installed for each size and type, but no fewer than one of each size and type.

1.7 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Accredited by NETA.
 - 1. Testing Agency's Field Supervisor: Currently certified by NETA to supervise on-site testing.

1.8 FIELD CONDITIONS

- A. Environmental Limitations: Rate equipment for continuous operation under the following conditions unless otherwise indicated:
 - 1. Ambient Temperature: Not less than minus -20 deg F and not exceeding 104 deg F
 - 2. Altitude: Not exceeding 6600 feet.

1.9 WARRANTY

- A. Manufacturer's Warranty: Manufacturer and Installer agree to repair or replace components that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period: One year(s) from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Seismic Performance: Enclosed switches and circuit breakers shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.
 - 1. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified and the unit will be fully operational after the seismic event."

2.2 GENERAL REQUIREMENTS

- A. Source Limitations: Obtain enclosed switches and circuit breakers, overcurrent protective devices, components, and accessories, within same product category, from single manufacturer.
- B. Product Selection for Restricted Space: Drawings indicate maximum dimensions for enclosed switches and circuit breakers, including clearances between enclosures, and adjacent surfaces and other items. Comply with indicated maximum dimensions.
- C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by an NRTL, and marked for intended location and application.
- D. Comply with NFPA 70.

2.3 FUSIBLE SWITCHES

- A. Type HD, Heavy Duty:
 - 1. Single throw.

- 2. Three pole.
- 3. 600-V ac.
- 4. 200 A and smaller.
- 5. UL 98 and NEMA KS 1, horsepower rated, with clips or bolt pads to accommodate indicated fuses.
- 6. Lockable handle with capability to accept padlocks and interlocked with cover in closed position.
- B. Accessories:
 - 1. Equipment Ground Kit: Internally mounted and labeled for copper ground conductors.
 - 2. Neutral Kit: Internally mounted; insulated, capable of being grounded and bonded; labeled for copper neutral conductors.
 - 3. Isolated Ground Kit: Internally mounted; insulated, labeled for copper neutral conductors.
 - 4. Class R Fuse Kit: Provides rejection of other fuse types when Class R fuses are specified.
 - 5. Auxiliary Contact Kit: As required to meet all contract requirements and intents.
 - 6. Service-Rated Switches: Labeled for use as service equipment.

2.4 NON-FUSIBLE SWITCHES

- A. Type HD, Heavy Duty, Three Pole, Single Throw, 600-V ac, 1200 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, lockable handle with capability to accept three padlocks, and interlocked with cover in closed position.
- B. Accessories:
 - 1. Equipment Ground Kit: Internally mounted and labeled for copper ground conductors.
 - 2. Neutral Kit: Internally mounted; insulated, capable of being grounded and bonded; labeled for copper neutral conductors.
 - 3. Isolated Ground Kit: Internally mounted; insulated, labeled for copper neutral conductors.
 - 4. Class R Fuse Kit: Provides rejection of other fuse types when Class R fuses are specified.
 - 5. Service-Rated Switches: Labeled for use as service equipment.

2.5 MOLDED-CASE CIRCUIT BREAKERS

- A. Circuit breakers shall be constructed using glass-reinforced insulating material. Current carrying components shall be completely isolated from the handle and the accessory mounting area.
- B. Circuit breakers shall have a toggle operating mechanism with common tripping of all poles, which provides quick-make, quick-break contact action. The circuit-breaker handle shall be over center, be trip free, and reside in a tripped position between on and off to provide local trip indication. Circuit-breaker escutcheon shall be clearly marked on and off in addition to providing international I/O markings. Equip circuit breaker with a push-to-trip button, located on the face of the circuit breaker to mechanically operate the circuit-breaker tripping mechanism for maintenance and testing purposes.
- C. The maximum ampere rating and UL, IEC, or other certification standards with applicable voltage systems and corresponding interrupting ratings shall be clearly marked on face of circuit breaker. Circuit breakers shall be 100 percent rated combinations for series connected interrupting ratings shall be listed by UL as recognized component combinations. Any series rated combination used shall be marked on the end-use equipment along with the statement "Caution Series Rated System. _____ Amps Available. Identical Replacement Component Required."
- D. MCCBs shall be equipped with a device for locking in the isolated position.
- E. Lugs shall be suitable for 140 deg F rated wire on 125-A circuit breakers and below.
- F. Standard: Comply with UL 489 with interrupting capacity to comply with available fault currents.
- G. Thermal-Magnetic Circuit Breakers: Inverse time-current thermal element for low-level overloads and instantaneous magnetic trip element for short circuits. Adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.
- H. Adjustable, Instantaneous-Trip Circuit Breakers: Magnetic trip element with front-mounted, field-adjustable trip setting.
- I. Electronic Trip Circuit Breakers: Field-replaceable rating plug, rms sensing, with the following field-adjustable settings:
 - 1. Instantaneous trip.
 - 2. Long- and short-time pickup levels.
 - 3. Long- and short-time time adjustments.
 - 4. Ground-fault pickup level, time delay, and I-squared t response.
- J. Current-Limiting Circuit Breakers: Frame sizes 400 A and smaller, and let-through ratings less than NEMA FU 1, RK-5.

- K. Integrally Fused Circuit Breakers: Thermal-magnetic trip element with integral limiter-style fuse listed for use with circuit breaker and trip activation on fuse opening or on opening of fuse compartment door.
- L. Ground-Fault Circuit-Interrupter (GFCI) Circuit Breakers: Single- and two-pole configurations with Class A ground-fault protection (6-mA trip).
- M. Ground-Fault Equipment-Protection (GFEP) Circuit Breakers: With Class B ground-fault protection (30-mA trip).
- N. Features and Accessories:
 - 1. Standard frame sizes, trip ratings, and number of poles.
 - 2. Lugs: Compression type, suitable for number, size, trip ratings, and conductor material.
 - 3. Application Listing: Appropriate for application; Type SWD for switching fluorescent lighting loads; Type HID for feeding fluorescent and high-intensity discharge lighting circuits.
 - 4. Ground-Fault Protection: Comply with UL 1053; integrally mounted, self-powered or remote-mounted and powered type with mechanical ground-fault indicator; relay with adjustable pickup and time-delay settings, push-to-test feature, internal memory, and shunt trip unit; and three-phase, zero-sequence current transformer/sensor.
 - 5. Communication Capability: Circuit-breaker-mounted or Universal-mounted integral Dinrail-mounted communication module with functions and features compatible with power monitoring and control system.
 - 6. Shunt Trip: Trip coil energized from separate circuit, with coil-clearing contact.
 - 7. Accessory Control Power Voltage: Integrally mounted, self-powered; Voltage as required for equipment supplied.

2.6 MOLDED-CASE SWITCHES

- A. Description: MCCB with fixed, high-set instantaneous trip only, and short-circuit withstand rating equal to equivalent breaker frame size interrupting rating.
- B. Standard: Comply with UL 489 with interrupting capacity to comply with available fault currents.
- C. Features and Accessories:
 - 1. Standard frame sizes and number of poles.
 - 2. Lugs:
 - a. Mechanical or Compression type, suitable for number, size, trip ratings, and conductor material.

- b. Lugs shall be suitable for 140 deg F rated wire on 125-A circuit breakers and below.
- 3. Ground-Fault Protection: Comply with UL 1053; remote-mounted and powered type with mechanical ground-fault indicator; relay with adjustable pickup and time-delay settings, push-to-test feature, internal memory, and shunt trip unit; and three-phase, zero-sequence current transformer/sensor.
- 4. Shunt Trip: Trip coil energized from separate circuit, with coil-clearing contact.
- 5. Undervoltage Trip: Set to operate at 35 to 75 percent of rated voltage without intentional time delay.
- 6. Auxiliary Contacts: Number and rating as required with "a" and "b" contacts; "a" contacts mimic switch contacts, "b" contacts operate in reverse of switch contacts.
- 7. Alarm Switch: As required to meet contract requirements and design intent.
- 8. Key Interlock Kit: Externally mounted to prohibit switch operation; key shall be removable only when switch is in off position.
- 9. Zone-Selective Interlocking: Integral with ground-fault shunt trip unit; for interlocking ground-fault protection function.
- 10. Electrical Operator: Provide remote control for on, off, and reset operations.
- 11. Accessory Control Power Voltage: Integrally mounted, self-powered or Remote mounted and powered; Voltage rating as required.

2.7 ENCLOSURES

- A. Enclosed Switches and Circuit Breakers: UL 489, NEMA KS 1, NEMA 250, and UL 50, to comply with environmental conditions at installed location.
- B. Conduit Entry: NEMA 250 Types 4, 4X, and 12 enclosures shall contain no knockouts. NEMA 250 Types 7 and 9 enclosures shall be provided with threaded conduit openings in both endwalls.
- C. Enclosures designated as NEMA 250 Type 4, 4X stainless steel, 12, or 12K shall have a dual cover interlock mechanism to prevent unintentional opening of the enclosure cover when the circuit breaker is ON and to prevent turning the circuit breaker ON when the enclosure cover is open.
- D. NEMA 250 Type 7/9 enclosures shall be furnished with a breather and drain kit to allow their use in outdoor and wet location applications.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine elements and surfaces to receive enclosed switches and circuit breakers for compliance with installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
 - 1. Commencement of work shall indicate Installer's acceptance of the areas and conditions as satisfactory.

3.2 PREPARATION

- A. Interruption of Existing Electric Service: Do not interrupt electric service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary electric service according to requirements indicated:
 - 1. Notify Owner no fewer than 14 days in advance of proposed interruption of electric service.
 - 2. Indicate method of providing temporary electric service.
 - 3. Do not proceed with interruption of electric service without owner's written permission.
 - 4. Comply with NFPA 70E.

3.3 ENCLOSURE ENVIRONMENTAL RATING APPLICATIONS

- A. Enclosed Switches and Circuit Breakers: Provide enclosures at installed locations with the following environmental ratings.
 - 1. Indoor, Dry and Clean Locations: NEMA 250, Type 1.
 - 2. Outdoor Locations: NEMA 250, Type 4X stainless steel.

3.4 INSTALLATION

- A. Coordinate layout and installation of switches, circuit breakers, and components with equipment served and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.
- B. Install individual wall-mounted switches and circuit breakers with tops at uniform height unless otherwise indicated.
- C. Install fuses in fusible devices.

D. Comply with NFPA 70 and NECA 1.

3.5 IDENTIFICATION

- 1. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs.
- 2. Label each enclosure with engraved metal or laminated-plastic nameplate.

3.6 FIELD QUALITY CONTROL

- A. Tests and Inspections for Switches:
 - 1. Visual and Mechanical Inspection:
 - a. Inspect physical and mechanical condition.
 - b. Inspect anchorage, alignment, grounding, and clearances.
 - c. Verify that the unit is clean.
 - d. Verify blade alignment, blade penetration, travel stops, and mechanical operation.
 - e. Verify that fuse sizes and types match the Specifications and Drawings.
 - f. Verify that each fuse has adequate mechanical support and contact integrity.
 - g. Inspect bolted electrical connections for high resistance using one of the two following methods:
 - 1) Use a low-resistance ohmmeter.
 - a) Compare bolted connection resistance values to values of similar connections. Investigate values that deviate from those of similar bolted connections by more than 50 percent of the lowest value.
 - 2) Verify tightness of accessible bolted electrical connections by calibrated torquewrench method in accordance with manufacturer's published data or NETA ATS Table 100.12.
 - a) Bolt-torque levels shall be in accordance with manufacturer's published data. In the absence of manufacturer's published data, use NETA ATS Table 100.12.
 - h. Verify that operation and sequencing of interlocking systems is as described in the Specifications and shown on the Drawings.
 - i. Verify correct phase barrier installation.
 - j. Verify lubrication of moving current-carrying parts and moving and sliding surfaces.
 - 2. Electrical Tests:
 - a. Perform resistance measurements through bolted connections with a low-resistance ohmmeter. Compare bolted connection resistance values to values of similar connections. Investigate values that deviate from adjacent poles or similar switches by more than 50 percent of the lowest value.

- b. Measure contact resistance across each switchblade fuseholder. Drop values shall not exceed the high level of the manufacturer's published data. If manufacturer's published data are not available, investigate values that deviate from adjacent poles or similar switches by more than 50 percent of the lowest value.
- c. Perform insulation-resistance tests for one minute on each pole, phase-to-phase and phase-to-ground with switch closed, and across each open pole. Apply voltage in accordance with manufacturer's published data. In the absence of manufacturer's published data, use Table 100.1 from the NETA ATS. Investigate values of insulation resistance less than those published in Table 100.1 or as recommended in manufacturer's published data.
- d. Measure fuse resistance. Investigate fuse-resistance values that deviate from each other by more than 15 percent.
- e. Perform ground fault test according to NETA ATS 7.14 "Ground Fault Protection Systems, Low-Voltage."
- B. Tests and Inspections for Molded Case Circuit Breakers:
 - 1. Visual and Mechanical Inspection:
 - a. Verify that equipment nameplate data are as described in the Specifications and shown on the Drawings.
 - b. Inspect physical and mechanical condition.
 - c. Inspect anchorage, alignment, grounding, and clearances.
 - d. Verify that the unit is clean.
 - e. Operate the circuit breaker to ensure smooth operation.
 - f. Inspect bolted electrical connections for high resistance using one of the two following methods:
 - 1) Use a low-resistance ohmmeter.
 - a) Compare bolted connection resistance values to values of similar connections. Investigate values that deviate from those of similar bolted connections by more than 50 percent of the lowest value.
 - 2) Verify tightness of accessible bolted electrical connections by calibrated torque-wrench method in accordance with manufacturer's published data or NETA ATS Table 100.12.
 - a) Bolt-torque levels shall be in accordance with manufacturer's published data. In the absence of manufacturer's published data, use NETA ATS Table 100.12.
 - g. Inspect operating mechanism, contacts, and chutes in unsealed units.
 - 2. Electrical Tests:
 - a. Perform resistance measurements through bolted connections with a low-resistance ohmmeter. Compare bolted connection resistance values to values of similar connections. Investigate values that deviate from adjacent poles or similar switches by more than 50 percent of the lowest value.

- b. Perform insulation-resistance tests for one minute on each pole, phase-to-phase and phase-to-ground with circuit breaker closed, and across each open pole. Apply voltage in accordance with manufacturer's published data. In the absence of manufacturer's published data, use Table 100.1 from the NETA ATS. Investigate values of insulation resistance less than those published in Table 100.1 or as recommended in manufacturer's published data.
- c. Perform a contact/pole resistance test. Drop values shall not exceed the high level of the manufacturer's published data. If manufacturer's published data are not available, investigate values that deviate from adjacent poles or similar switches by more than 50 percent of the lowest value.
- d. Perform insulation resistance tests on all control wiring with respect to ground. Applied potential shall be 500-V dc for 300-V rated cable and 1000-V dc for 600-V rated cable. Test duration shall be one minute. For units with solid state components, follow manufacturer's recommendation. Insulation resistance values shall be no less than two megohms.
- e. Determine the following by primary current injection:
 - 1) Long-time pickup and delay. Pickup values shall be as specified. Trip characteristics shall not exceed manufacturer's published time-current characteristic tolerance band, including adjustment factors.
 - 2) Short-time pickup and delay. Short-time pickup values shall be as specified. Trip characteristics shall not exceed manufacturer's published time-current characteristic tolerance band, including adjustment factors.
 - 3) Ground-fault pickup and time delay. Ground-fault pickup values shall be as specified. Trip characteristics shall not exceed manufacturer's published time-current characteristic tolerance band, including adjustment factors.
 - 4) Instantaneous pickup. Instantaneous pickup values shall be as specified and within manufacturer's published tolerances.
- 3. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.
- 4. Perform the following infrared scan tests and inspections and prepare reports:
 - a. Initial Infrared Scanning: After Substantial Completion, but not more than 60 days after Final Acceptance, perform an infrared scan of each enclosed switch and circuit breaker. Remove front panels so joints and connections are accessible to portable scanner.
 - b. Follow-up Infrared Scanning: Perform an additional follow-up infrared scan of each enclosed switch and circuit breaker 11 months after date of Substantial Completion.
 - c. Instruments and Equipment: Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.
- 5. Test and adjust controls, remote monitoring, and safeties. Replace damaged and malfunctioning controls and equipment.

C. Enclosed switches and circuit breakers will be considered defective if they do not pass tests and inspections.

3.7 ADJUSTING

A. Adjust moving parts and operable components to function smoothly and lubricate as recommended by manufacturer.

END OF SECTION 26 28 16



TECHNICAL SPECIFICATIONS SECTION

34 77 39

TURNKEY BAGGAGE HANDLING SYSTEM

PERFORMANCE SPECIFICATION

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SECTION 34 77 39 TURNKEY BAGGAGE HANDLING SYSTEM – PERFORMANCE SPECIFICATION

PART-1 GENERAL

1.1 SUMMARY:

- 1.1.A. This specification Section (34 77 39) includes the performance specification, information contained herein, and any references to the drawing packages and associated discipline reports or supplemental documentation (annexes, et.al) provided for this turnkey project.
- 1.1.B. This specification is a performance-based description of the Baggage Handling System (BHS) work; the detailed design of the BHS is the responsibility of the BHSC. The extent of the BHS work is shown on the drawings and is defined to include all labor, materials, equipment, and supervision required to furnish, fabricate, and install the BHS specified herein and the BHS work shall meet the spatial design and functional requirements of these contract documents.
- 1.1.C. Furnish and install all necessary equipment to provide functional, complete, operable, and maintainable systems, which includes, but is not limited to:
 - 1. Equipment including conveyor bed sections, drives, take ups, all transport of conveyor, flat plate claim carousel, sideguards, shrouding, floor supports, panels and conveyor trim, warning beacons and audio messages, draft curtains, security/fire doors, controls, electrical equipment and materials, and guard rails as indicated or required to provide complete and operable systems.
 - 2. Coiling Security and Fire Doors as specified herein, including operation, controls, interfaces, and power as described in this section.
 - 3. Guardrails adjacent to conveyors and recirculating devices as indicated on the baggage system drawings.
 - 4. Electrical work and controls for baggage handling equipment and related equipment (coiling doors, etc.) referenced in this section and on the baggage system drawings, unless noted otherwise.
 - 5. Interface connections and coordination as specified herein including but not limited to signage, fire alarm and smoke detection systems, as well as security access control system(s).
 - 6. Testing and commissioning of the system is required for approval. These coordination requirements are in addition to the performance acceptance requirements specified elsewhere in this document.
 - a. All labor and materials are to be provided by the BHSC.
 - 7. Badging:
 - a. Refer to General Conditions and Supplementary General Conditions and applicable provisions of Specification Divisions 00 and 01 for badging requirements.

- b. All badging will be by the Contractor. The Owner will not provide any escorts for unbadged contractor or subcontractor personnel.
- c. Contractor badging process to begin ASAP after contract execution and continue during design/mobilization period. Most work will be in controlled access areas of the airport and Contractor's employees and subcontractors must be badged. The Contractor will need to provide escorts for any un-badged incidental workers/visitors. All un-badged visitors must obtain a daily Visitor Badge from the Communication Center. Badging at MHT involves filling out an informational form and presenting two forms of gov-issued I.D. (commonly = driver lic. & passport) then fingerprinting for a background check which can take up to one-to-two weeks. Computer-based training (1 to 2 hrs.) at the MHT training room is also required upon successful background check results.

1.1.D. Related Sections:

- 1. Division 00 Procurement and Contracting Requirements (General Conditions and Supplemental General Conditions).
- 2. Division 01 General Requirements.
- 3. General Conditions and Supplementary General Conditions and applicable provisions of Specification Divisions 00 and 01.
- 4. Metal Fabrications, which are part of the BHS work, shall be provided in accordance with best industry standards and practices for similar BHS work.
- 5. Electrical requirements for general provisions, materials, and installations in accordance with Specification Division 26, latest adopted NEC, and local electrical code requirements, whichever is more stringent.
- 6. Communications requirements for general provisions, materials, and installations shall be in accordance with Specification Division 27, latest adopted NEC and adopted ANSI/TIA/EIA standards, and local communications code requirements, whichever is more stringent.
- 7. Access Control System modifications will be provided by the Owner. Controls interface with the BHS shall be maintained similar to the existing operations. BHSC shall coordinate all ACS work during the detailed design.
- 8. Fire Alarm and Smoke Detection System work will be by the Owner/others. Controls interface with the baggage system shall be maintained similar to the existing system.
- 9. Coordinate with the Owner for all Airport system(s) interface requirements. Controls and operational requirements are identified on the plans.

- 1.1.E. Materials/Workmanship:
 - 1. Materials shall be of the quality specified herein, new, free from defects, of the best commercial/industrial grade, and approved by a nationally recognized testing laboratory wherever published standards exist.
 - 2. Materials shall be standardized and of the same make and manufacturer throughout the project, wherever possible.
 - 3. All bearings and bolts shall be of standard sizes and the amount of different sizes shall be minimal where possible.
 - 4. Steel and Connection Standards: Steel and connections shall meet the following standards in addition to those specified elsewhere in this document:
 - a. Structural plates shall confirm to ASTM A-36.
 - b. Hot rolled sheets and coils shall conform to ASTM A A1011/A1011M.
 - c. Structural steel shapes shall conform to ASTM A-36.
 - d. All welding electrodes shall conform to AWS A-5.2. Use the standard code for arc and gas welding in building construction as a guide to general procedure and qualification of welders.
 - e. All fasteners shall conform to ASTM A-307 Class 2A thread fit for bolts and Class 2B thread fit for nuts. All fasteners shall be zinc plated or equivalent. All fasteners shall be locked with locknuts or lock washers.

1.2 SUPPLIMENTAL REFERENCE DOCUMENTATION

- 1.2.A. Reference Standards:
 - 1. Comply with the requirements of the reference standards noted herein, except where more stringent requirements are listed herein or otherwise required by the Contract Documents.
 - 2. The publications of the codes and standards listed below form a part of this specification section to the same extent as if bound herein. The publications are referred to in the text by basic designation only.
 - 3. All electrical work shall be in accordance with the latest applicable municipal electrical code and the NEC., whichever is more stringent.
 - 4. All work shall be in accordance with the latest applicable municipal building code and the IBC, whichever is more stringent.
- 1.2.B. Additional Codes and Standards:
 - 1. Federal Safety and Health Laws:
 - a. All equipment and accessory items furnished and installed under this contract shall always be governed by applicable provisions of the Federal laws, including, but not limited to, the latest revisions of the following:
 - 1) William Steiger Occupational Safety and Health Act of 1970, Public Laws 91596.
 - 2) Part 1910 Occupational Safety and Health Standards, Chapter XVII of Title 29, Code of Federal Regulations.
 - 3) Part 1926 Occupational Safety and Health Standards, Chapter XVII of Title 29, Code of Federal Regulations.
 - 2. Reference Documents:
 - a. American Gear Manufacturers Association Standards (AGMA):
 - ANSI/AGMA 6013-B16- (latest adopted edition) Standard for Industrial Enclosed Gear Drives;
 - 2) ANSI/AGMA 6034-B92-R2016- (latest adopted edition) Practice for Enclosed Cylindrical Wormgear Speed Reducers and Gearmotors;
 - ANSI/AGMA 6035-A02- (latest adopted edition) Design, Rating and Application of Industrial Globoidal Wormgearing;
 - 4) Copies of AGMA Standards may be obtained from the American Gear Manufacturers Association, 1001 N. Fairfax Street, Suite 500, Alexandria, VA 22314-1587.
 - 5) Internet address: <u>www.agma.org</u>
 - b. American National Standards Institute (ANSI):
 - 1) ANSI Z535.1- 2017 (latest edition) Safety Colors;
 - 2) ANSI/IEEE C2- (latest adopted edition) National Electrical Safety Code;
 - 3) ANSI/NECA/BICSI 568- (latest adopted edition) Installing Commercial Building Telecommunications Cabling;
 - 4) ANSI/NECA/BICSI 607- (latest adopted edition) Telecommunications Bonding and Grounding Planning and Installation Methods for Commercial Buildings;
 - 5) Copies of ANSI Standards may be obtained from the American National Standards Institute, 1899 L Street NW, 11th Floor, Washington, DC 20036.

- 6) Internet address: <u>www.ansi.org</u>
- c. American Society for Testing and Materials (ASTM):
 - ASTM A36-14 (latest adopted edition) Standard Specification for Carbon Structural Steel;
 - ASTM A1011/A1011M- 18a (latest adopted edition) Standard Specification For Steel, Sheet And Strip, Hot-Rolled, Carbon, Structural, High-Strength Low Alloy, high-strength Low Alloy With Improved Formability, And Ultra-High Strength;
 - 3) ASTM A307-14e1 (latest adopted edition) Standard Specification For Carbon Steel Bolts, Studs, And Threaded Rod 60,000 PSI Tensile Strength;
 - 4) ASTM A563-15 (latest adopted edition) Standard Specification For Carbon And Alloy Steel Nuts;
 - 5) Copies of ASTM Standards may be obtained from the American Society for Testing and Materials, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959.
 - 6) Internet address: <u>www.astm.org</u>
- d. American Society of Mechanical Engineers (ASME):
 - 1) B20.1- (latest adopted edition) Safety Standard for Conveyors and Related Equipment;
 - 2) B29.1- (latest adopted edition) Precision Power Transmission Roller Chains, Attachments, And Sprockets;
 - 3) Copies of ASME Standards may be obtained from the American Society of Mechanical Engineers, Two Park Avenue, New York, NY 10016-5990.
 - 4) Internet address: <u>www.asme.org</u>
- e. American Welding Society (AWS):
 - 1) AWS A2.4:(latest adopted edition) Standard Symbols for Welding, Brazing, and Nondestructive Examination;
 - AWS C1.1M/C1.1:(latest adopted edition) Recommended Practice for Resistance Welding;
 - 3) AWS D1.1/D1.1M:(latest adopted edition) Structural Welding Code Steel;
 - 4) AWS D1.2/D1.2M:(latest adopted edition) Structural Welding Code Aluminum;

- 5) Copies of AWS publications may be obtained from the American Welding Society, 8669 NW 36 Street, #130, Miami, FL 33166-6672.
- 6) Internet address: <u>www.aws.org</u>
- f. Conveyor Equipment Manufacturers Association (CEMA):
 - 1) ANSI/CEMA 401- (latest adopted edition) Roller Conveyor Non-Powered;
 - 2) ANSI/CEMA 402- (latest adopted edition) Belt Conveyors;
 - 3) ANSI/CEMA B105.1- (latest adopted edition) Specification for Welded Steel Conveyor Pulleys with Compression Type Hubs;
 - 4) Copies of CEMA Standards may be obtained from the Conveyor Equipment Manufacturers Association, 5672 Strand Ct., Ste. 2, Naples, FL 34110.
 - 5) Internet address: <u>www.cemanet.org</u>
- g. International Air Transport Association (IATA):
 - 1) Passenger Standards Conference Manual (PSCM), latest adopted edition:
 - a) Resolution 740 Form of Interline Bag Tag;
 - b) Resolution 753 Baggage Tracking;
 - c) Recommended Practice 1740a Baggage Tag Media Quality Guidelines;
 - d) Recommended Practice 1740b License Plate Fallback Sortation Tag;
 - e) Recommended Practice 1740c Radio Frequency Identification (RFID) Specifications for Interline Baggage;
 - f) Recommended Practice 1740d Read and Sortation Rate in Baggage Handling Systems;
 - g) Recommended Practice 1745 Baggage Information Messages;
 - h) Recommended Practice 1797b Baggage System Interface;
 - i) Recommended Practice 1800 Automated Baggage Handling Based on IATA License Plate Concept.
 - 2) Airport Development Reference Manual (ADRM), latest adopted edition;
 - 3) Copies of IATA Standards, Resolutions, and Recommended Practices may be obtained from the International Air Transport Association, Publications Assistant,

800 Place Victoria, P.O. Box 113, Montreal, Quebec, Canada, H42 1M2; or IATA Centre, 33, Route de l'Aeroport, P.O. Box 416, 1215 Geneva - 15 Airport, Switzerland.

- 4) Internet address: <u>www.iata.org</u>
- h. International Electrotechnical Commission (IEC):
 - IEC 60204-1 (latest adopted edition) Safety of Machinery Electrical Equipment of Machines;
 - IEC 60947-4-1 (latest adopted edition) Low-Voltage Switchgear and Controlgear -Part 4-1: Contactors and Motor-Starters - Electromechanical Contactors and Motor-Starters;
 - IEC 61508 (latest adopted edition) Functional safety of Electrical/Electronic/programmable Electronic (E/E/PE) Safety Related Systems;
 - 4) IEC 62061 (latest adopted edition) Functional Safety of Safety-Related Electrical, Electronic and Programmable Electronic Control Systems;
 - 5) IEC 529 (latest adopted edition) IP Environmental Ratings;
 - 6) Copies of IEC Standards may be obtained from the International Electrotechnical Commission, 3, rue de Varembé, P.O. Box 131, CH-1211 Geneva 20, Switzerland.
 - 7) Internet address: <u>www.iec.ch</u>
- i. Institute of Electrical and Electronics Engineers (IEEE):
 - 1) IEEE 519 (latest edition) Recommended Practice and Requirements for Harmonic Control in Electric Power Systems;
 - Copies of IEEE Standards may be obtained from the Institute of Electrical and Electronics Engineers by contacting <u>onlinesupport@ieee.org</u>;
 - 3) Internet address: <u>www.ieee.org</u>
- j. International Organization for Standardization (ISO):
 - 1) ISO 9001:2000 Quality Assurance Systems;
 - ISO 12100 (latest adopted edition) Safety of Machinery General Principles for Design;
 - ISO 13849 (latest adopted edition) Safety of Machinery Safety-Related Parts of Control Systems;

- 4) ISO 13850 (latest adopted edition) Safety of Machinery-Emergency Stop Function-Principles for Design;
- 5) ISO 13854 (latest adopted edition) Safety of Machinery Minimum Gaps to Avoid Crushing of Parts of the Human Body;
- 6) ISO 13855 (latest adopted edition) Safety of Machinery The Positioning of Protective Equipment in Respect to Approach Speeds of Parts of the Human Body;
- 7) ISO 13857 (latest adopted edition) Safety of Machinery Safety Distances to Prevent Dangerous Areas Being Reached by the Upper and Lower Limbs;
- 8) ISO 14118 (latest adopted edition) Safety of Machinery Prevention of Unexpected Start-up;
- 9) ISO 14119 (latest adopted edition) Safety of Machinery Interlocking Devices Associated with Guards - Principles for Design and Selection;
- 10) ISO 14120 (latest adopted edition) Safety of Machinery Guards General Requirements for the Design and Construction of Fixed and Movable Guards;
- Copies of ISO Standards may be obtained from the International Organization for Standardization, ISO Central Secretariat, BIBC II, 8, Chemin de Blandonnet, CP 401, 1214 Vernier, Geneva, Switzerland.
- 12) Internet address: <u>www.iso.gov</u>
- k. National Electrical Manufacturers Association (NEMA):
 - 1) NEMA ICS-1 (latest adopted edition) Industrial Controls and System general requirements;
 - ANSI/NEMA MG-1- (latest adopted edition) Motors and Generators Includes Supplement;
 - Copies of NEMA Standards may be obtained from the National Electrical Manufacturers Association, 1300 North 17th Street, Suite 900, Arlington, VA 22209.
 - 4) Internet address: <u>www.nema.org</u>
- 1. National Fire Protection Association (NFPA):
 - NFPA 70 (latest adopted edition) National Electrical Code National Fire Code, or latest adopted issue. Laws, rules, and regulations for installing electrical cabling, equipment, and components; and network cabling and related components and equipment;

- 2) NFPA 70E (latest adopted edition) Electrical Safety in the Workplace, or latest adopted issue;
- 3) NFPA 79 (latest adopted edition) Electrical Standard for Industrial Machinery, or latest adopted issue;
- 4) Copies of NFPA publications may be obtained from National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471.
- 5) Internet address: <u>www.nfpa.org</u>
- m. National Institute of Standards and Technology (NIST):
 - 1) FED-STD-H28 series- (latest adopted edition) Screw Thread Standards;
 - 2) Copies of handbook H 28 may be obtained upon application accompanied by a money order, coupon, or cash, to the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402.
 - 3) Internet address: <u>www.nist.gov</u>
- n. Telecommunications Industry Association (TIA):
 - TIA 526-14-C- (latest adopted edition) Optical Power Loss Measurements of Installed MultiMode Fiber Cable Plant;
 - 2) TIA 568.0-D (latest adopted edition) Generic Telecommunications Cabling for Customer Premises;
 - 3) TIA 568.1-D (latest adopted edition) Commercial Building Telecommunications Infrastructure Standard;
 - 4) TIA 568.2-D (latest adopted edition) Commercial Balanced Twisted Pair, Telecommunications Cabling And Components Standard;
 - 5) TIA 568.3-D (latest adopted edition) Optical Fiber Cabling and Components Standard;
 - 6) TIA-569 (latest adopted edition) Telecommunication Pathways and Spaces;
 - 7) TIA-606-C (latest adopted edition) Administration Standard for Telecommunications Infrastructure;
 - 8) TIA-607-D (latest adopted edition) Generic Telecommunications Bonding And grounding (Earthing) For Customer Premises;
 - 9) TIA-758-B (latest adopted edition) Customer-Owned Outside Plant Telecommunications Infrastructure Standard;

- 10) Copies of TIA Standards may be obtained from the Telecommunications Industry Association, 1310 North Courthouse Road, Suite 890, Arlington, VA 22201.
- 11) Internet address: <u>standards.tiaonline.org</u>
- o. Underwriters Laboratories (UL):
 - 1) UL 6 (latest adopted edition) Electrical Rigid Metal Conduit Steel;
 - 2) UL 797 (latest adopted edition) Electrical Metallic Tubing Steel;
 - 3) UL 187 (latest adopted edition) Standard for X-ray Equipment (Electrical);
 - 4) UL 60601-1 (latest adopted edition) Safety Medical Electrical Equipment;
 - 5) UL 10B (latest adopted edition) Standard Fire Tests of Door Assemblies;
 - 6) UL 508A (latest adopted edition) Standard for Industrial Control Panels;
 - UL 60947-4-1 (latest adopted edition) Low-Voltage Switchgear and Controlgear -Part 4-1: Contactors and Motor-Starters - Electromechanical Contactors and Motor-Starters;
 - 8) UL 62 (latest adopted edition) Flexible Cords and Cables;
 - 9) Copies of UL Standards may be obtained from the Underwriters Laboratories, UL Headquarters, 333 Pfingsten Road, Northbrook, IL 60062.
 - 10) Internet address: <u>www.ul.com</u>
- 3. Standards:
 - a. The equipment covered by these specifications shall be designed, assembled and tested in accordance with the latest applicable standards of the National Electrical Manufacturers Association (NEMA) or International Electrotechnical Commission (IEC), the Institute of Electrical and Electronic Engineers (IEEE), the American National Standards Institute (ANSI), the International Organization for Standardization (ISO), the Conveyor Equipment Manufacturer's Association (CEMA), and Underwriters Laboratories (UL). All materials furnished shall be new, free from defects and UL-approved where such approval is granted to the equipment to be furnished. In addition to the above requirements, all applicable equipment shall conform to the most recently published applicable federal specifications and applicable OSHA specifications.
 - b. Acceptance standards for weld performance and application shall be in accordance with the specifications for structural welding AWS D 1.1-88 and other applicable AWS specifications.

1.3 DEFINITIONS AND ABBREVIATIONS:

- 1.3.A. Abbreviations and Acronyms:
 - 1. AFF: Above Finish Floor.
 - 2. ATO: Airline Ticketing Office.
 - 3. AWS: American Welding Society.
 - 4. BHS: Baggage Handling System.
 - 5. BHSC: Baggage Handling System Contractor.
 - 6. DBU: Date of Beneficial Use.
 - 7. DHS: Department of Homeland Security.
 - 8. DPR: Design Performance Requirements.
 - 9. HVAC: Heating, Ventilation, and Air Conditioning.
 - 10. IATA: International Air Transportation Association.
 - 11. OAR: Owner Authorized Representative
 - 12. O&M: Operations and Maintenance.
 - 13. PE: Photoelectric Cell (Photoeye).
 - 14. PIV: Peak Inverse Voltage.
 - 15. PLC: Programmable Logic Controller.
 - 16. THD: Total Harmonic Distortion.
 - 17. TOB: Top of Belt.
 - 18. TSA: Transportation Security Administration
 - 19. VFD: Variable Frequency Drive.

1.3.B. Definition of Terms:

- 1. Refer to the General Conditions and Supplementary General Conditions for additional definitions.
- 2. <u>Access Control System (ACS)</u>: The security system controlling/monitoring door access.

- 3. <u>As-Built:</u> A comprehensive set of documents identifying the complete and final condition of the system.
- 4. <u>Baggage Handling Systems (BHS)</u>: Transport system or systems of baggage transport equipment consisting of a complete system of static and dynamic mechanical and electrical components as specified in this section.
- 5. <u>Baggage Handling System Contractor (BHSC)</u>: Installer/integrator of baggage handling system equipment working as either a General/Prime Contractor or as a Subcontractor to a General/Prime Contractor.
- 6. <u>Base Building Contractor/General Contractor/Prime Contractor (GC)</u>: General Contractor (GC) for Base Building Contract.
- 7. <u>Design Defect:</u> Inappropriate action of control system components during operational conditions, discovering of an imminent safety hazard or occurrence of an accident during operational conditions, or failure to meet "System Reliability" requirements herein.
- 8. <u>Fire Alarm System (FAS):</u> Fire alarm system for the building.
- 9. <u>Input Conveyor Lines:</u> Conveyors that transport baggage from inputs (ticket counter, curbside, and transfer) to other conveyor lines.
- 10. Motor Control Panel (MCP): Enclosure for the BHS electrical and control components.
- 11. <u>"</u>
- 12. <u>Or Approved Equal</u>: Allows products that are equal to the specific products listed but requires approval of an equal product through the substitution process.
- 13. <u>Or Equal</u>: Allows products that are equal to the specific products listed. Does not require approval of an equal product through the substitution process.
- 14. Owner: City of Manchester NH, Department of Aviation
- 15. <u>Pre-ISAT Testing</u>: This testing is to be performed by the BHSC as part of their internal testing to perform all tests required for ISAT Testing to prove that the system is ready for ISAT Testing.
- 16. Programmable Logic Controller (PLC): Controller for the BHS.
- 17. <u>Request for Information (RFI)</u>: A formal written request to Owner from a bidder or BHSC requesting additional information or clarifications to the Specifications or plans.
- 18. <u>Request for Substitution (RFS):</u> A formal written request to the Owner from a bidder or BHSC requesting permission to substitute an approved equal product, component, service, or action from one called out in the Specifications.

- 19. <u>Support Steel</u>: Additional steel assemblies added to the structural steel to support header steel for the Baggage System supports.
- 20. <u>Ticket Counter Conveyor Lines:</u> Conveyors that transport baggage from the ticket counter input to a collector conveyor line.

1.4 BHS CONTRACTOR QUALIFICATION REQUIREMENTS:

- 1.4.A. General:
 - 1. The Submitting BHSC shall have a minimum of ten years of successful experience in the baggage handling industry designing, manufacturing, modifying, installing, and commissioning baggage handling systems including fully integrated and automated systems. Provide a list of projects completed which demonstrate compliance with this requirement. Upon request of the Owner, provide references, i.e., names and telephone numbers of clients served who have knowledge of the submitting BHSC's performance in the areas noted.
 - 2. The Submitting BHSC shall have successfully designed, manufactured, installed, and commissioned a minimum of three Baggage Handling System projects, complete with the characteristics noted above within the past five years, with each project being a minimum of similar size and scope to the Checked Baggage Handling System modifications proposed.
 - 3. The Submitting BHSC shall, upon request of the Owner, provide documentation that demonstrates strong, established, and proven working relationships among the BHSC's selected team members. (This includes listing successfully completed and/or ongoing projects working with the team set forth)
 - 4. The Submitting BHSC shall demonstrate that they have a suitably sized staff and manufacturing capability to meet peak phases of work. Upon request of the Owner, provide a description of resource strategies that ensure staffing for this project.
 - 5. The Submitting BHSC shall, upon request of the Owner, submit documentation that demonstrates its track record of meeting deadlines and working within a projected budget.
 - 6. BHS Project Manager: Subcontractor's project manager who has successfully completed the installation and commissioning the previous five (5) years of at least two (2) systems of similar scope of Baggage Handling System as herein specified within the United States.
 - 7. Installer: If the BHS is to be installed by an entity other than the Supplier, the Installer and its Supervisory personnel shall be listed on the bid forms and shall comply with the following requirements. Qualified personnel shall install the equipment with factory-trained and certified supervisors. Supervisory personnel shall each have at least five (5) years of successful experience with the installation of airport in-line baggage screening systems and BHS devices of the type specified herein.

- 8. Electrical Installer: If the Electrical Installation is by an entity other than the Supplier, the Electrical Installer and its Supervisory personnel shall be listed on the bid forms and shall comply with the following requirements.
- 9. The Electrical Installer shall have not less than five (5) years continuous experience in the installation of similar systems, as specified herein; including systems utilizing PLC operated motor control panels and controls, as specified herein.
- 10. Structural Engineer: The Baggage System Structural Engineer shall be responsible for the engineering of all Baggage System installation drawings, catwalk plan and elevation drawings, building attachment and connection details, building loads and BHS support system drawings, support steel, header steel, sill supports, sway and seismic bracing, as required herein. The Structural Engineer shall be registered in the location of installation.

1.5 BHS CONTROLS CONTRACTOR QUALIFICATION REQUIREMENTS:

1.5.A. General:

- The Submitting Controls Contractor/Subcontractor shall demonstrate a minimum of five years of successful experience in distributed and centralized power and drives, Motor Control Panels (MCPs), PLC programming with remote I/O systems using Ethernet/IP, HMI programming for baggage status display (BSDs) in CBRA as well as manual encode console, development of Sort Allocation Controller (SAC); Maintenance Diagnostic System (MDS); and Reporting system for the entire BHS (from ticket counters through CBIS to the sortation), integration (programming and commissioning) with EDS provider per IRD, and demonstrating FAT to the stakeholders. Upon request of the Owner, provide a list of projects completed demonstrating compliance with this requirement, and provide references, i.e., names and telephone numbers of clients served who have knowledge of the submitting contractor's performance in the areas noted.
- 2. The Submitting Controls Contractor/Subcontractor must have Controls Engineers (or Software Engineers) who have experience with components listed above. In addition, Controls Engineers must have recent successful experience in positive bag tracking using shaft encoders and photoeyes through the conveying system and devices including vertical sorters, merges, diverters, along with dynamic bag spacing windows. Software Engineers must have recent experience in interfaces with BSM via SITA, development of dashboards, and server/network virtualizations. All engineers must have good understanding of industrial network security.
- 3. The Submitting Controls Contractor/Subcontractor shall have successfully designed, installed, and commissioned Controls systems for a minimum of two Re-capitalized Baggage Handling System (CBIS) projects within the last five years with complex phases that require portions of the system to be operational during phasing.
- 4. The Submitting Controls Contractor/Subcontractor shall demonstrate the successful completion of a minimum of two successful BHS projects within the last five years that involve Controls Optimization such as PLC hardware replacement, server(s) replacement,

adding new interfaces with other controllers (e.g., ATR, BMA, BSM, and FIDS) to the existing system, CBRA upgrade to the later version of PGDS.

- 5. Control Engineering Team:
 - a. The control engineering team as a company shall have at least two (2) Control Engineers; and the firm shall have successfully completed the design, installation and testing of at least ten (10) systems of similar scope of Baggage Handling System.
 - b. A Senior Control Engineer shall be assigned to the project as Lead Control Engineer and shall continue to work on the project site for the project duration. No replacement shall be allowed without prior written approval from the OAR of the proposed replacement for the key personnel identified.
 - c. Controls Assembler: The electrical control panel and control station assembler shall have not less than five years continuous experience in the assembly of PLC operated motor control panels. Motor control panels and control stations shall be assembled in an UL Listed shop.
 - d. If the BHS control and electrical engineering works include fabrication and installation that is subcontracted to other firms, the BHSC shall submit a list of subcontractors (Upon request of the Owner) for:
 - 1) Lower level control software and hardware;
 - 2) MCP and panel fabrications;
 - 3) Field wiring:
 - e. List shall indicate what percentage the subcontractor shall be responsible for its associated scope of work .
- 6. After award of project, the approved control engineering team and the subcontractors for upper level control software and hardware, lower level control software and hardware, MCP and panel fabrications and field wiring shall not be replaced by others; their scope of work percentages shall not be changed.

1.6 SYSTEM DESCRIPTION:

1.6.A. General:

- 1. The Baggage Systems Work consists of installation of baggage handling equipment as shown on the Baggage System Contract Drawings. Baggage System components shall be in compliance with the requirements herein. BHSC shall provide components that comply with the requirements of these specifications.
- 2. The work of this section includes furnishing all materials, equipment, labor, supervision, tools, and items necessary for the construction, installation, connection, testing, and operation

of all conveyor mechanical and electrical work for this Project, as indicated on the Baggage System Drawings and described in this section of the specifications.

- 3. BHSC must perform a complete mechanical, electrical, and Controls field survey prior to preparation of Shop Drawings and must identify all conflicts created by or resulting from existing conditions or work by others.
- 1.6.B. Installation:
 - 1. BHSC must furnish and install all necessary equipment to provide a complete, operable and maintainable system including but not limited to: conveyor bed sections, drives, take-ups, sideguards, shrouding, floor supports, stainless steel panels and conveyor trim, fire/security doors, draft curtains, guard rails, control panels, conduit and wiring, all as necessary to provide a complete operable code compliant system.
 - 2. BHS system controls including interface with all baggage-related equipment and screening equipment and any other materials or equipment required to provide a complete, operable, and maintainable system in complete compliance with this specification.
 - 3. Submission of all shop and installation drawings shall provide adequate details representing actual equipment to be installed. General installation details will not be accepted. Approval by OAR is required prior to any installation.

1.7 SUBMITTALS:

- 1.7.A. General:
 - 1. Submit submittal schedule for the project.
 - 2. Refer to Specification Section 01 30 00 for submission procedures. Provide separate shop and installation drawing submittals for each system or subsystem. Fabrication and installation shall not commence until shop drawings and required data are submitted by the BHSC and approved by the OAR. After acceptance, no variations from the submittal data will be permitted except by written consent of the OAR.
 - 3. It should be noted that additional submissions not included in the below listing may / will be required in accordance with the overall construction project requirements set forth elsewhere. At a minimum, the following items must be included:
- 1.7.B. Documents Required:
 - 1. Substitutions:
 - a. Approval of substitute products shall be considered only under the terms and conditions specified in Specification Section 01 60 01.

- b. BHSC shall indicate its substitutions to the OAR in writing at time of BID. The BHSC shall not purchase any alternative products prior to obtaining the written consent from the OAR during the construction phase post BID phase.
- 2. Submittal Review Schedule: BHSC shall submit a detailed and comprehensive schedule of submittals with delivery dates prior to submission of all other submittals and no more than 10 days after award of contract for review, comment, and acceptance.
- 3. Material List: Submit a list of all materials, which shall be of the quality specified herein, new, free from defects, of the best commercial/industrial grade and approved by a nationally recognized testing laboratory wherever published standards exist, including specific catalog numbers where applicable, to the OAR and no more than 15 days for Phase-1 and 45 days for Phase-2, after award of contract for review, comment, and acceptance prior to procurement.
- 4. Work Schedules:
 - a. Submit comprehensive work schedule of BHS work as identified herein within 7 calendar days for Phase-1 and 30 calendar days for Phase-2, after award of contract for review, comment, and acceptance by the OAR. Identify clearly any modifications to the milestone dates provided in the contractors BID proposal schedule with justification for the change as well as mitigation efforts employed to ensure final delivery date is maintained.
 - b. BHSC shall include a written narrative of sequencing identifying the proposed sequencing plan.
 - c. For Phasing/Sequencing changes, the Phasing/Sequencing Plans and Schedules shall be updated and submitted to the OAR for review, comment, and acceptance.
- 5. Schedules:
 - a. Schedules shall be updated monthly and submitted to the OAR for review and coordination.
- 6. Warranty Draft: Submit draft copy of warranty for review, comment, and acceptance by the OAR, as specified herein for complete operating baggage handling systems for Owner's review. Submit within 30 calendar days after award of contract and include all specified inclusions. Refer to Part 5 of this specification for more warranty requirements.
- 7. Work/Contingency Plans:
 - a. Submit a detailed Work Plan for each installation requiring a shutdown, overnight changeover, and/or change in operation within 30 calendar days after award of contract. Work Plan submittal shall identify tasks, duration of tasks, deadlines for overnight changeovers, back-up plans for missed overnight change-over deadlines, and Contractor's internal task deadlines; for review, comment, and acceptance by the OAR.

- 1) Start and finish dates for the following activities:
 - a) BHSC's internal deadlines for completion of pertinent facility interfaces by other disciplines (e.g., permanent system power, support structures, etc.).
 - b) Overnight changeovers and scheduled turnover for each system.
 - c) BHSC's internal equipment testing.
 - d) Operational dates for each system with back-up plan for overnight changeovers and scheduled turnovers.
 - e) Final acceptance testing for each system with back-up plan for overnight changeovers and scheduled turnovers.
 - f) System observation and punch-list preparation of the system.
- 2) Detailed description of demolition, removal, or alteration work for specific planned work.
- 3) Detailed description of baggage handling system mechanical installation for specific planned work.
- 4) Detailed description of baggage handling system electrical installation for specific planned work.
- 5) Detailed description of activities required to complete overnight changeovers to ensure that disruption to baggage handling services is kept to a minimum and within the limited time frames. Include all preparatory work by all other trades. Provide backup plan for recovery of operations if changeover work will not be completed on time.
- 6) Construction work plan for coordination and operational interface to ensure on-going Airport/Airline baggage handling operation is not disrupted.
- 7) At the beginning of each phase, submit a list of power outages required, indicating anticipated duration. All power outages shall be scheduled during low operations periods or during non-regular working hours. Power shall only be disconnected by approved personnel. Refer to Division 26 for scheduling of power outages. Must be included in overall work plan schedule.
- 8. Product Data:
 - a. Submit mechanical and electrical component OEM's product data and cut sheets for all purchased items as needed, including but not limited to the following: motors, reducers, gearmotors, motorized pulleys, mechanical brakes, clutches, bearings, bushings, pulleys, return rollers, belting, chain and sprockets, belts and sheaves, flat and spiral power turns,

merges, queues, high speed diverters, claim and make-up carousels, fire/security doors, scales, manual encoders, wiring devices, control devices, soft starts, VFDs, MCP, PLC, etc., in an orderly bookmarked form in one comprehensive submittal after award of the Contract in accordance with Section 01 30 00 (Submittals) for all mechanical and electrical components provided for this Work. The equipment that is to be provided for this Work shall be clearly indicated appropriately with arrows, where multiple items are shown in the data. Partial lists and general catalogs will not be accepted. Failure to comply with these requirements shall be deemed as the Contractor's agreement to furnish the exact materials specified or materials based on these specifications. Product data shall be submitted prior to shop drawing submission. After acceptance, no variations from the submittal data will be permitted except by written in accordance with the substitution process described elsewhere.

- b. Provide OEMs manufacturer's product information on each component of BHS that will be used in the project .The product data and cut sheets information shall be completely legible and specific items used in the system must be indicated with a shaded arrow.
- c. Mechanical: Mechanical product data shall be separate from, not combined with, electrical/controls product data and shall be organized in format and naming for incorporation into the O&M Manual format.
- d. Electrical/Low Level Controls: Electrical/Low Level Controls product data shall be separate from, not combined with, mechanical or high-level controls hardware/software product data and shall be organized in format and naming for incorporation into the O&M Manual format.
- 9. BHS Standard Equipment Drawings
 - a. Submit assembly and sub-assembly component drawings that will be used in this project. The standard component drawings such as conveyor end brackets, intermediate bed sections, flat plate make-up units.
- 10. System Power Requirements
- 1.7.C. Approved OEM List of BHS Equipment
- 1.7.D. Mechanical Installation Drawing
- 1.7.E. Electrical Installation Drawing
- 1.7.F. Shop Drawings:
 - a. General:
 - 1) Assemble shop drawings into coordinated submittals. Drawings shall be complete, orderly, and applicable to this installation only. Standard drawings properly referenced to assembly drawings are acceptable. Only drawings stamped with

acceptance by the OAR, as required by the General Conditions, Supplementary General Conditions, and/or Division 01, shall be used for fabrication and installation.

- 2) Identify each part in reference to a bill of material which shall indicate each part name, number, description, quantity, size, gauge, model name and number of purchases, component, and reference to detail part drawings or assembly drawing, if required for fabrication.
- b. Mechanical:
 - In addition to the submittal requirements specified in the General Conditions, Supplementary General Conditions, and/or Division 01, submit shop drawings for each conveyor system, existing BHS (if any) to be integrated into the complete functional BHS and all of its components, including layout (Existing, modified and new BHS), typical details of assembly, erection and anchorage drawn at large scale. Consolidated shop drawings for the items listed below shall be provided. Piecemeal submissions are not acceptable and will be rejected and returned. At a minimum, include the following items:
 - a) Location, type, and load of supports, each reaction at building connection and lateral bracing; additional steel members necessary to support BHS and catwalk; specific vibration isolation devices and techniques utilized at each support. For vibration isolation, shop drawings shall indicate specific structural loads, isolation device type, and device rating at each support.
 - b) Layout plan of BHS with dimensions and elevations with components tied to the detailed bill of materials list. Section/Elevation drawings of the BHS keyed to the layout with components tied to the bill of materials list. Building and other building systems shown in the background for coordination.
 - c) Location, dimensions, and rating of drive units.
 - d) Stanchions for each load conveyor and carousel.
- c. Electrical/Low Level Controls:
 - Wiring diagrams for the complete power distribution systems and control systems. Submittal shall be completed with summary index page, legend page, comprehensive electrical installation notes, detailed device layout, detailed part list, power load, wiring diagrams, conduit size, conduit routing layout, electrical components, control station layouts, system layout plan showing control locations, static system map, PLC layout, wiring of I/O, interfaces with other systems, VFDs, etc. Fuses to be identified by wiring diagram rung ID. Electrical shop drawings must be submitted together with a complete description of operation for the upper and lower level controls.

- 2) Electrical/Controls Shop Drawings shall be submitted for review, comment, and acceptance. Controls/electrical work as identified herein shall not be started without approved shop drawings.
- 3) Provide shop drawing detailing layout, front view, wiring schematics, material list, spare parts, etc. of each motor control panel.
- 4) Wire numbers shall identify all wiring shown on controls/electrical drawings and shall be used for actual wire numbers in the field.
- 5) All equipment shall be properly labeled on controls/electrical drawings.
- 6) All equipment and wiring contacts shall be properly cross-referenced for easy review and installation.
- 7) Static BHS map for each subsystem.
- 8) Stanchions for each load conveyor and carousel.
- 2. Warranty Finalization: After the draft warrant submittal has been accepted in the submittal process, submit final copy of warranty for final review, comment, and acceptance by the OAR, as specified herein for complete operating baggage handling systems for Owner's review. Submit within 30 calendar days prior to completion of the system and include all specified inclusions. Refer to Part 5 of this specification for more warranty requirements.
- BHSC Internal Test Plans: BHSC shall submit Test Plan(s) for each system(s) for compliance with the requirements herein. The Test Plan(s) must be submitted by the BHSC to the OAR for review, comment, and acceptance prior to testing of the system(s). Refer to Part 4 for Test Plan requirements herein.
- 4. Commissioning Test Plans: BHSC shall submit Commissioning Plan(s) for each system(s) for compliance with the requirements herein. The Commissioning Plan(s) must be submitted by the BHSC for the OAR's review, comment, and acceptance prior to commissioning of the system(s). Refer to Part 4 for Commissioning Plan requirements herein.
- 5. Commissioning Tests Signoffs: BHSC to submit signed off copies of the test plans for the completed commissioning testing to the OAR with sign-off of each activity in the test plan for review, acceptance, and sign-off by OAR, Owner, and other applicable stakeholders. Submit within 24 hours from test completion. Signoffs will be used in documentation to applicable stakeholders and the project closeout documentation.
- 6. Deficiency Tracking Items Submission & Signoff:
 - a. During testing period, BHSC is to submit an electronic list of the BHSC's deficiency items and programming issues being tracked to the OAR bi-weekly during internal test and weekly during commissioning testing for review of open items. List must identify the tracking number, description of item, status of item (open or closed), estimated date to be

resolved, and date resolved. List must include all items opened and closed for proper tracking.

- b. Once deficiency open items have been resolved, BHSC is to submit signed off copies of the BHSC's deficiency items and programming issues being tracked to the OAR with sign-off of each deficiency item for review, acceptance, and sign-off by OAR, Owner, and other applicable stakeholders. Submit within 24 hours from completion of all deficiency corrections. Signoffs will be used in documentation to applicable stakeholders and the project closeout documentation.
- 7. As-Builts:
 - a. Prior to project closeout, submit revised BHS mechanical, electrical and structural layouts and assembly drawings showing all field changes to the approved configuration signed and sealed by an engineer licensed in the state/district the work is performed in.
 - b. Mechanical Drawings:
 - 1) Complete As-Built drawings Plans and Sections.
 - 2) All equipment shall be detailed and dimensioned down to the assembly level of detail and shall represent the actual installed conditions in all respects, general spatial representation blocks will not be accepted.
 - c. Electrical Drawings:
 - 1) Complete As-Built schematics.
 - 2) Power and control device location layouts.
 - 3) Power and control device field terminations.
 - 4) MCP back panel layout diagrams.
 - 5) MCP door layout diagrams.
 - 6) Status panel layout diagrams.
 - 7) Control station faceplate and legend layout diagrams.

1.8 REQUESTS FOR INFORMATION (RFIs):

- 1.8.A. General:
 - 1. If the BHSC needs clarification on items relating to the Contract Documents, the BHSC must submit an RFI for each item formally to the Owner in writing In accordance with the overall contract requirements set forth in Division 01.

- 2. The RFI must reference an activity on the Progress Schedule and must note time criticality of the RFI, indicating time within which a response is required and priority when more than one RFI is submitted at the same time.
- 3. If the BHSC is satisfied with the clarification and does not request a change in Contract Sum or Contract Time, then the clarification will be executed without a change.
- 4. If the BHSC believes that the clarification results in a change in Contract Sum or Contract Time, then the BHSC must notify the Owner, who may then deny the request for change or issue an RFP.
- 5. The BHSC must not contract, purchase, or cause to be delivered any articles, devices, or material relating to the RFI prior to obtaining the written response from the Owner.
- 6. RFIs may not be used to request deviations or substitutions. The substitution process approved by the owner shall be followed.

1.9 QUALITY CONTROL:

- 1.9.A. Workmanship:
 - 1. All workmanship shall be in accordance with the best commercial practice consistent with heavy-duty airport applications.
 - 2. All materials and components furnished shall be new and free from defects. Used equipment, whether reconditioned or refurbished, is expressly prohibited.
 - 3. Equipment is to be designed to meet the requirements of handling airline baggage.
 - 4. Field installed equipment upgrades and modifications will not be conducted without written approval of the Owner.
 - 5. Fabrication of all projections, welds, surfaces, and transfer points between conveyors shall be constructed and finished in a manner which eliminates damage to baggage which is considered to be conveyable.
 - 6. In addition to the Owner's Open Issues Log/Deficiency List, the BHSC shall identify and track deficiencies found during the installation and testing. All deficiency items must be resolved prior to completion acceptance.
- 1.9.B. Standardization:
 - 1. When multiple manufacturers are listed for a specific component within this specification, the BHSC shall use one specified manufacturer for a specific component.
- 1.9.C. Quality Control Resolutions:
 - 1. During conveyor installation, Owner will perform inspections of the system.

- 2. All discrepancies found will be noted on the Owner's Open Issues Log. Items noted on the Owner's Open Issues Log will be brought up to the BHSC for discussion.
- 3. A resolution date for each item on the log shall be agreed upon with the BHSC.
- 4. If the discrepancy is not corrected within the accepted timeframe, the item the BHSC will be considered to be non-compliant with the contract documents.
- 5. At that time, the BHS will be given 24 hours to correct the discrepancy.
- 6. If the discrepancy is not corrected within 24 hours, a Letter of Non-Compliance will be issued to the BHSC.
- 7. The Letter of Non-Compliance will state the issue(s), when the issue was discovered, the specification reference to the issue, and the monetary value of the issue for which the BHSC will be responsible.
- 8. Discrepancies found during inspections that are determined by any safety inspector to be a safety or operations issue requiring immediate attention must be immediately addressed by the BHSC.

1.10 DELIVERY, STORAGE AND HANDLING:

1.10.A. General:

- 1. Delivery, storage, and handling shall be in accordance with Specifications Section 01 60 00.
- 2. Necessary Protection of the work:
 - a. Methods of storage of conveyor materials shall protect the materials from weather, rust, air-born grit, and other construction debris. Deteriorated, including rusted equipment shall not be installed.
 - b. The BHSC shall coordinate with the Prime Contractor and/or OAR regarding Logistics transport, provide a weekly schedule update to include current and forecasted work information including, but not limited to:
 - 1) Lay down area requirements per phase, sequence, or work package;
 - 2) Logistics transportation schedule;
 - 3) Long Lead Item Order/Deliver schedule;

1.11 PROJECT / SITE CONDITIONS:

1.11.A. General:

- 1. Refer to Divisions 00 and 01, and the Contract Documents for additional project/site conditions.
- 2. Demolition of Existing Conveyors
 - a. BHSC must demolish all required existing conveyors as identified within the plans and all temporary conveyors, including all conveyor bed sections, drives, take-ups, sideguards, shrouding, floor supports, stainless steel panels and conveyor trim, fire/security doors, draft curtains, guard rails, control panels, conduit and wiring, all controls (back to source) to return the facility back to its original condition.
 - b. The Owner will have first right of refusal on all existing conveyor equipment to be removed. Any removed conveyor equipment remaining will become property of the BHSC and must be removed from the site in a timely manner. At no time will conveyor equipment to be removed remain on site in excess of 48 hours without written approval from the Owner.
 - c. Items that are identified by Owner for salvaging, but are not removed by the Owner, shall be delivered to the Owner within perimeter of Airport in coordination with the Owner. BHSC shall remove all mechanical and electrical items, raceways and wiring abandoned as a result of the various work items, unless otherwise noted. All raceways, wiring, associated fittings scheduled for demolition shall become the property of the BHSC, after the Owner has salvaged what items they require, and shall be removed from the premises. Do not reinstall existing raceways and wiring unless specifically indicated. The identified demolition items shall be recorded for both Owner items and BHSC items and the record shall be delivered to the Owner. Items to be demolished shall not be abandoned in place and shall be removed to the source.

1.11.B. Coordination of the Work:

- 1. The General Contractor and/or the Baggage System Contractor shall coordinate with all other trades on the project for the installation of the Baggage System equipment and verify that the right-of-way for the equipment is preserved.
- 2. They shall coordinate all wall openings associated with the Baggage System for proper clearances in accordance with the requirements of the Contract Documents based on the equipment proposed for installation.
- 3. The BHSC shall field verify all existing conditions prior to the development of any shop drawings. The design documents provided are intended to verify the general right of way using industry standardized equipment. Due to BHSC's actual equipment used, these final routing dimensions may vary slightly from that which is shown on the bid documents. In all cased the BHSC shall confirm that the proposed final installed product fits within the ROW

provided. If a discrepancy is identified the BHSC shall notify the OAR immediately for further determination, coordination, and resolution.

1.12 SEQUENCING:

1.12.A. General:

- 1. Refer to the project phasing drawings and the baggage system phasing drawings (These are part of the Contract Documents).
- General planned Sequencing is identified in Specification Section 01 01 00 SUMMARY OF WORK and is to be used as a general outline of the strategy developed. The BHSC may propose alternate sequencing steps for efficiency consideration as detailed in the formal Phasing/Sequencing Plan and Scheduling submission requirements.
- 3. Sequencing of installation may be referred to as Work Packages, Steps, Phases, etc. In all respects on this project, the BHS works shall be performed in a planned, scheduled, and formally executed process which minimizes the impacts to operations, is coordinated with the general construction works, supports the project timeline and schedule milestones, and does not interfere with other ongoing projects at the Airport.

1.13 SCHEDULING:

1.13.A. General:

- 1. BHSC shall develop a Gantt chart roll up Schedule with a minimum of 3 levels outlining the Phases, Work packages, and subsequent Steps in coordination with the Phasing/Sequencing Plans identified in section 1.12 (Sequencing) above.
- 2. Schedules shall be updated monthly and if Phasing/Sequencing Plans are changed.
- 3. For testing, BHSC is to develop a Schedule showing each test identified in the test plans with proposed test dates and times.

PART-2 PRODUCTS / PERFORMANCE:

2.1 SYSTEM PERFORMANCE:

- 2.1.A. General:
 - 1. This specification sets the performance criteria of the systems. Contractor shall be solely responsible for the detailed design, fabrication, and installation of the systems to satisfy the requirements herein.
 - 2. Materials shall be of the quality specified herein, free from defects, of the best commercial/industrial grade, and approved by a nationally recognized testing laboratory wherever published standards exist. Materials shall be standardized and of the same make and manufacturer throughout the project, wherever possible.
 - 3. Steel and Connection Standards: Steel and connections shall meet the following standards:
 - a. Structural plates shall conform to ASTM A-36/A36M-14.
 - b. Hot rolled sheets and coils shall conform to SAE J126-2015.
 - c. Structural steel shapes shall conform to ASTM A-36/A36M-14.
 - d. All welding electrodes shall conform to AWS A-5.2/A5.2M:2018. Use the standard code for arc and gas welding in building construction as a guide to general procedure and qualification of welders.
 - e. All fasteners shall conform to ASTM A-307-14e1 Class 2A thread fit for bolts and Class 2B thread fit for nuts. All fasteners shall be zinc plated or equivalent. All fasteners shall be locked with locknuts or lock washers.
 - f. All bearings and bolts shall be of standard sizes and the amount of different sizes shall be minimal, where possible.
 - 4. Skirting: Provide skirting on all load and unload conveyors in all tenant staffed areas and shall cover all rotating components. Provide flared sideguard(s) on adjacent downstream conveyor, as detailed in the BHS drawings. Skirting is not required where guardrail is provided adjacent to the conveyor. In the Checked Baggage Reconciliation Area (CBRA), skirting shall extend down to the floor to keep users from going under the conveyor. If the backside of conveyors is accessible to users in the CBRA, then skirting must also be provided to the floor on the backside of the conveyor.
 - 5. Sideguards:
 - a. The back sideguards at the load conveyor shall be 21" in height.

- 6. Conveyor Openings:
 - a. Where conveyor penetrates the floor or other walking/working surfaces, the gap between the equipment and the edge of the opening shall be secured so that no person or tools can fall through the gap. The materials used to secure the gap shall be easily removable.
- 7. Fire Resistance Filler at Fire Doors: Provide fire resistance filler at the locations of Fire Door to seal any openings that allow fire to penetrate.
- 8. Draft Curtains: Provide draft curtain with each security/fire door.
- 9. Expansion Joints: Expansion Joints have been placed throughout the existing building. The BHSC shall design the BHS to accommodate the building movement at each expansion joint; the design shall not cause any bags to have a jam, mis-tracking, lost-tracking, or interruption of BHS operation.
- 10. All BHS equipment in the public space shall have stainless steel trim/finishes (including the control stations).
- 11. Interfaces:
 - a. Building Management System (BMS) Interface:
 - 1) Baggage Handling System shall have its own local SCADA, so the BMS is to be informed only of the overall system status.
 - 2) All the electric consumption must be reported to the metering system deployed in the Terminal Building.
 - b. Fire Alarm/Detection System (FADS) Interface:
 - 1) Provide wiring, contacts, circuitry, and programming to stop the BHS in a control fashion upon direction from the Fire Alarm/Detection System. See "Descriptions of Operations" for control sequences. Coordinate with Fire Alarm/Detection System for interface programming and connection requirements.
 - 2) The BHSC shall coordinate with the GC and/or FADS Contractor for the interface between BHS and FADS.
 - 3) The GC and/or FADS Contractor will provide an interface box with a dry contact closure, wiring and conduits within five (5) feet from each MCP which controls a fire door.
 - 4) The BHSC shall provide wiring and conduit from the interface box to the associated MCP and to the associated door controller. The BHSC shall terminate the wiring in the interface box with the assistant of FADS Contractor and shall terminate the wiring in the MCP and in the door controller.

- 5) The BHSC shall ensure that when a signal is sent to the dry contact from the FADS, that the conveyor line shall shut down appropriately.
- 6) The interface of the BHS to the FADS will be one (1) dry contact closure per MCP which controls the fire doors. Refer to the FADS drawings for the location of this contact.
- 7) Additional interface requirements are identified herein.
- c. Access Control System (ACS) Interface:
 - 1) Outbound Baggage Systems: A security access card reader/key pad will be furnished and installed by the Access Control System Contractor, at each START control station indicated on the baggage system drawings. The card reader/key pad(s) shall enable the START pushbuttons along the load conveyor in the input area. The baggage system or subsystem associated with that security station shall not be activated until the card reader/key pad has been accessed and approved. When access is approved, the system shall be started by pressing the START pushbutton. If security system is not functioning, a jumper in the MCP shall be provided for operation during ACS down time only. Jumper shall not be operational when ACS is operational. Dry contacts shall be furnished and installed in a junction box at location(s) indicated on the baggage system and security system drawings, for interface with the security system. Provide contacts, circuitry, and programming as specified herein or shown on the drawings for Access Control system start up approval, shut down, and security door status. The security door status interface shall be set up to identify when each security door is in its open position while the baggage system is in operation, when each security door is in the closed position and the baggage system is deactivated, when each security door is open, but the baggage system is not in operation, and when there is a fault condition with each security door, and it is not operating properly. At a minimum, fault conditions of each door and the door open/system deactivated condition shall be sent to the security system for monitoring. Coordinate with Access Control System for interface programming and connection requirements.
- 12. Special Control Functions:
 - a. Security/Fire Doors:
 - Provide connection to limit switches and/or other monitoring devices on security/fire doors and additional contacts, if necessary, for monitoring of door open and door closed positions, and operational status of the door. These contacts shall be used for monitoring purposes by the baggage system and the Access Control System.
 - 2) Provide photosensor at security/fire door to detect presence of baggage. If baggage is detected, the conveyor belt shall advance to deliver the bag. If baggage is still detected, the warning system shall sound. This photosensor shall not function in this manner when the fire detection system interface is activated.

- 3) Doors that are strictly fire doors and do not provide a security function, as indicated in the door schedule on the drawings, shall function the same as security doors at all times, except in the event of a fire, when they shall operate as indicated herein in the "Description of Operation" for each type of baggage system. Fire doors shall be provided with fusible links and labeled for the required fire rating by UL or an approved testing laboratory as described herein.
- 4) Doors with security function shall operate as indicated herein in the Description of Operation.
- 5) Both types of doors, security and fire shall be closed during automatic system timeout.
- 6) The BHSC shall provide doors that meet the requirements of these specifications and the requirements/physical constraints within the location of installation.
- b. Hold-In Circuit:
 - PLC logic shall be designed in the PLC program to ensure that all timers shall stop and not time out whenever a system is stopped, so that no baggage can generate false alarms or become stranded between the load belt and the bag room or claim device. On a jam in the subsystem, it does not make any difference if the subsystem times out. Once the jam is cleared and the Jam Reset PB is pressed to clear the jam, the subsystem shall restart. Therefore, the PLC logic is not an issue for the subsystem with the jam. The issue arises with the upstream subsystems. If there are no bags on the upstream subsystems, those subsystems can be allowed to time out. When the first bag head-end stops on an upstream subsystem and the upstream subsystems. Timers should reset as long as the head-end condition is active. Subsystems should be programmed like this, and a testing scenario developed, because just testing the jammed subsystem PLC logic is not adequate.
 - 2) On an E-Stop in the subsystem, if there are no bags head-end stopped on an upstream subsystem or blocking an auto-start photoeye, releasing the E-Stop should not start the subsystem, even if there are bags on the subsystem. Having a subsystem start solely by the resetting of an E-Stop is not allowed. When the first bag head-end stops or blocks an auto-start photoeye on an upstream subsystem because the subsystem is stopped, an auto-start signal should be sent to the subsystem and the upstream subsystems timers should reset as long as the head-end condition is active. Subsystems should be programmed like this, and a testing scenario developed, because just testing the E Stopped subsystem PLC logic is not adequate.
 - 3) General: If someone presses the E-Stop, they are responsible to restart the system, unless there is an auto-start signal from an upstream subsystem. None of the systems shall overcome personnel actions of using an E-Stop.

c. Jam Sensors:

- 1) Jam photosensors and associated timers shall be positioned at the discharge end of all conveyors feeding power turns and inclines, except where power turn is located in public view behind check in counters. Jam photosensors and associated timers shall be provided for every two sections of horizontal and decline conveyor, each section of incline conveyor, and discharge end of decline conveyors feeding an adjacent conveyor section of a different slope. If baggage blocks the photosensor for a timed interval exceeding the set point of the timer (adjustable 0-10 seconds), that conveyor plus the adjacent downstream conveyor shall stop and all related upstream conveyors shall stop in a cascade shut down progressing upstream as bags block the photosensor of each section of conveyor. At power turns, spiral turns, queue conveyors, and short conveyors, where applicable, the shutdown operation shall be the same as identified above, except that the conveyor section upstream of the conveyor section shall also stop. Additionally, an alarm shall sound on the associated motor control panel (MCP), and an amber JAM light shall be lit on each associated loading belt pushbutton station, at the appropriate point on the System Status OIT located on the front panel of the affected MCP, and on the Fault Monitoring PC, where provided. The MCP shall have a button for silencing the alarm. Each jam photosensor shall be provided with an adjacent amber JAM RESET illuminated pushbutton in the associated control station. After the jam has been cleared, actuation of any JAM RESET pushbutton on the associated system shall turn off all indicator lights and restart the stopped conveyors with the Start-up Warning sequence. If the bag jam shut down does not affect the public area, the Start-up Warning system shall not be activated in the public area.
- 2) Additionally, jam detection circuitry shall only function when the respective conveyor is running; i.e., if a conveyor stops running and, as a result, a bag blocks a jam photosensor, no false jam indication shall be generated.
- 3) Photosensors and reflector shall be securely and rigidly installed and located in areas not subject to misalignment by transported baggage bumping the unit.
- 4) RESET push-buttons at make-up devices, claim devices, and in staffed areas shall be keyed.
- d. Public Accessible Emergency Stop Reset: At all E STOP pushbutton stations located in areas accessible to the public, the reset function shall be key operated in addition to resetting the pushbutton.
- e. Manual ("Hand") Operation: Provide "Hand-Off-Auto" switches for all motors of the baggage systems, as indicated on the Baggage System Drawings. "Hand-Off-Auto" switches shall be wired so that when set to "Hand," the associated conveyor section shall run continuously; when set to "Off," the associated conveyor section shall not run; and when set to "Auto", the associated conveyor section shall run in automated mode as controlled by the PLC. When set to "Hand" or "Off" mode, the "Hand-Off-Auto" indicator on the associated motor control panel shall be lit. Conveyor sections upstream

of the conveyor section in "Hand" or "Off" shall not operate except by being set to "Hand" mode. "Hand-Off-Auto" switches shall be keyed in staffed areas. In the event that an E Stop is activated on the associated system while a section is under manual operation, that section shall not automatically restart when the E Stop is deactivated to prevent a safety hazard condition for maintenance personnel. Starting any conveyor in manual operation mode shall, at a minimum, activate the Start-up Warning subsystem in the local area of the activated conveyor sections.

- f. Control Stations: Provide a control station enclosure at each conveyor section with a bag jam photosensor, mounted on the conveyor frame as required herein. Jam reset, E Stop, and other associated pushbuttons and selector switches shall be installed in these enclosures. "Hand-Off-Auto" selector switches shall be provided for each conveyor drive and may be grouped in control stations provided that the drive controlled, and its associated conveyor belt are fully visible from the control station. Other control stations may be required besides bag jam reset control stations. At the entrance conveyor for the EDS units, provide a control station on the load side where shown on the drawings, which shall have an E-Stop, "Start" pushbutton, "Test Bag" switch, and "Test Bag" indicator light. At the exit conveyor for the EDS units, provide a control station on the load side where shown on the drawings, which shall have an E-Stop, "Start" pushbutton, and "Test Bag" indicator light. Along the conveyor sections, size each control station enclosure appropriately for the number of pushbuttons and switches to be installed. E-Stops, jam resets, and other required pushbuttons and switches for each conveyor section shall be grouped together as appropriate, unless noted otherwise on the drawings or herein. Separate control stations may be required for E stops as required herein. Every control station with an E-Stop shall also contain a "Start" or "Jam Reset/Start" pushbutton to restart the system after the E-Stop has been deactivated. At make-up devices, provide control stations as indicated on the baggage system drawings and as required herein with E-Stop and "Start" pushbuttons. Jam Reset control stations shall be located adjacent to the associated jam photosensor, unless the jam photosensor is not easily accessed from the floor, a platform, or catwalk. In this case, the location shall be coordinated with the Owner's representative. Each control station with a "Jam Reset/Start" push-button shall also have an E-Stop and a Jam indicator light. A jam shall only be reset by the closest Jam Reset pushbutton and the next upstream and downstream Jam Reset pushbuttons. Refer to baggage system drawings for control station configurations. Control station controls shall be as listed below, as identified herein, and as shown on the Baggage System Contract Drawings.
 - 1) Control Station Illuminated maintained contact push/pull mushroom head Emergency Stop pushbuttons shall be Red.
 - 2) Control Station Jam Reset/Start pushbuttons shall be Green (keyed in staffed areas).
 - 3) Control Station Jam indicator lights shall be Amber.
 - 4) Control Station HOA selector switch (keyed in staffed areas).

- 5) Input Control Station Illuminated maintained contact push/pull mushroom head Emergency Stop pushbuttons shall be Red.
- 6) Input Control Station Malfunction/Belt Full indicator lights shall be Amber.
- 7) Input Control Station Security Door Not Open/Bag on Belt indicator lights shall be Blue.
- 8) Input Control Station Start pushbuttons shall be Green.
- 9) Input Control Station Stop pushbuttons shall be Black.
- 10) Input Control Station Malfunction indicator lights shall be Amber.
- 11) Input Control Station Bag Advance pushbuttons shall be Green.
- 12) Input Control Station Bag Dispatch pushbuttons shall be Green.
- g. Emergency Stops, Motor Overloads, and Circuit Breakers: E Stops, motor overloads, and circuit breakers shall be zoned for shut down. Zones shall be wired in series. If the Highest priority zone is taken offline (due to e-stop, circuit breaker trip, or overload trip) it shall also take Zones of lesser priority offline that are up-stream. Zones of lesser priority (those upstream) shall not take Zones of Higher priority (those downstream) offline. Description of zones shall be in the Description of Operations submittal. Refer to submittal requirements.
- h. E-Stop Zoning: When one or more E-Stops are activated on a subsystem, the E-Stop zone associated with that system will cease to run until the E-Stop(s) have been deactivated and the system has been restarted. Restart after E-Stop deactivation shall be from any JAM RESET/START pushbutton in that subsystem or by Auto Start, whichever occurs first. E-Stop deactivation (mushroom head pulled out) shall place the subsystem in "Ready to Start" mode. E-Stop zoning shall conform to the following conditions:
 - 1) E-Stops along the system inside the ticketing and CBIS area shall stop all of the conveyors in the ticketing and CBIS area for that system.
 - 2) E-Stops along the system inside the bag make-up area shall stop all of the conveyors in the bag make-up area for that system. Upstream conveyors in the ticketing and CBIS area shall cascade stop.
 - 3) E-Stops on the conveyors at the wall between the CBIS and make-up areas shall stop all conveyors for that system.
 - 4) E-Stops at a Claim Device shall stop the claim device and the associated security/fire doors.

- 5) E-Stop on the EDS unit shall stop the associated conveyor line. E-Stops on the associated conveyor line shall not E-Stop the EDS unit, but the EDS shall not deliver bags onto the dead conveyor section.
- i. System Start up: System activation from a stopped condition in a staffed area shall activate the start-up sequence of the warning system as described herein prior to the systems operating. Systems shall not start up under any circumstances without activating the start-up warning system procedures. Start-up warning system shall be in accordance with ANSI B-20.1.

2.2 BELTED BED CONVEYORS:

- 2.2.A. Description:
 - 1. General use steel frame slider bed conveyors for normal and high speed operations.

2.2.B. Static Components:

- 1. Beds: Sturdy slider bed construction is required. The bed shall be constructed of #11 gauge steel with a strong and well braced frame consisting of a minimum of 5" x 1 1/2" x #11 gauge formed channel frame rails with cross braces and a maximum of 3' 4" centers on transport lines and 2' 6" centers on the loading belts. Butt type coupling joints shall be employed with the joints epoxy filled and ground smooth. Cross braces shall be located so as not to contact the belt run under normal circumstances. Bed widths are as shown on the drawings.
 - a. End brackets for head and tail pulley shaft bearings shall be constructed of a minimum of #11 gauge steel. Mounting of these bearings directly to the conveyor framework shall not be accepted.
 - b. Adjacent conveyors shall be bolted together. Welding shall not be permitted as an assembly technique.
 - c. Bed sections that are to be incorporated into conveyors in conjunction with existing sections shall be fabricated to match into the existing sections without misalignment or irregularity. Field verify all existing conditions as required.
- 2. Shrouding:
 - a. Shrouding shall be provided for conveyor equipment located in public areas as shown on the drawings. The shrouding shall be formed stainless steel, minimum 12 gauge, Type 304 with #4 brushed finish running longitudinally. All connections shall be smooth and flush without openings.
 - b. Shrouding shall be provided for conveyor equipment located in the CBIS and CBRA as shown on the drawings and shall extend from the sideguard height to the floor. The shrouding shall be formed steel, minimum 12 gauge, painted to match the conveyor bed frame. All connections shall be smooth and flush without openings. Removal of

shrouding for maintenance access shall be accomplished by one person taking no more than 5 minutes.

- c. All joints between stainless steel sections shall be uniform with adjacent surfaces properly aligned. Tolerances of joint width and surface alignment shall not exceed 1/16" per foot, which shall not be accumulative. Joints shall align properly, where joint meet and are parallel with each other.
- d. Where stainless steel shrouding requires a laminated substrate for stiffness, the substrate shall be laminated on all surfaces for stabilization and moisture control to prevent warp age.

2.3 **RECIRCULATING DEVICES:**

- 2.3.A. Flat Plate Recirculating Devices:
 - 1. Size: Oversize width with $39"\pm$ clear conveying surface. Heights as shown on the drawings.
 - 2. Load Rating: The maximum structural load shall be 200 pounds per lin. foot. The normal live load shall be a minimum of 75 pounds per lin. foot.
 - 3. Flights:
 - a. The flights shall be crescent shaped conveying platforms and shall be manufactured from a minimum of ¹/₄" C.R. steel.
 - b. For devices in public areas, the exposed surface of all flights shall be covered with a molded vulcanized black urethane or neoprene covering or other approved treatment.
 - c. Devices used in baggage make up areas shall be a minimum of ¹/4" C.R. steel with a black oxide finish.
 - 4. Chain: The flights shall ride on self-aligning interconnecting chain links with guide rollers.
 - 5. Support Rollers: A minimum of two rows of 1 15/16" (min. dia.) ball bearing mounted wheels or rollers shall be used to support the flights. The rollers or wheels shall be mounted on centers so as to accommodate the static and live loads required.
 - 6. Lubrication: A system for automatic or remote lubrication of the drive assembly and chain shall be provided.
 - 7. Trim: Side rails shall be a 6" formed angle of #8 gauge mild steel, or 12 gauge stainless steel if used in an area exposed to the public. The trim angle also serves as a luggage and finger guard to prevent contact with the edges of the pallets.
 - 8. Toe Space: A 6" high toe space shall be provided at the base of the skirt.

- 9. Finish: All surfaces exposed to the public except the conveying surface shall be Type 304 with #4 brushed finish stainless steel.
- 10. Drive Assembly: The drive shall consist of a heavy duty roller chain driven by a motor through gear reducer. The roller chain shall engage at least two carrier assemblies at all times.
- 11. Drive: The drive shall be designed for operation from a 480 VAC, 3 phase, 60 Hz power source. Each drive shall be provided with a Soft Start Controller. The drive shall be sized to permit start up under full load conditions. Motors shall be as specified for conveyor sections. Reducers type shall be Dodge "APG" series, Sumitomo "SM Cyclo" series, or equal. Soft Start Controller type shall be as specified herein.
- 12. Skirting: Provide continuous 14 gauge, minimum, skirting around all make-up devices, flush with toe space from base of unit to floor or work surface. Skirting shall be rigidly mounted to make-up device but shall be removable for maintenance access.
- 13. Products: Manufacturers offering products in conformance with the requirements herein include: Siemens Systems, VanDerLande Industries, Beumer Group, Logan Conveyor, Glidepath, or equal.

2.4 MISCELLANEOUS EQUIPMENT AND MATERIAL:

- 2.4.A. Draft Curtains:
 - 1. Draft curtains shall be provided where shown on the drawings and shall be flexible strip doors with two staggered layers of 8" x 1/16" strips color "Black".
- 2.4.B. Curbing and Guardrails:
 - 1. Steel tube guardrails shall be provided as shown on the baggage drawings for protection of conveyor sections, drive assemblies, and electrical hardware vulnerable to damage by tug/cart movements. (Concrete curbing, if required, will be furnished, and installed within the General Contract).
- 2.4.C. Security/Fire Doors:
 - 1. Security and fire doors are required as shown on the drawings and shall be 1-1/2 hour fire rated minimum, electrically operated coiling/rolling type. Door models shall be selected to conform to the limited space available inside the claim devices and within doghouses where applicable. All exposed surfaces visible to the public shall be stainless steel, type 304 with #4 brushed finish. Accessibility to all motors, operators, emergency operators, door attachments, guide attachments, hoods, etc. shall be from the secured side of the door only, unless noted otherwise.
 - 2. Operation: Shall be by motor operator. Power supply shall be provided through the associated baggage system and controls shall be coordinated with the baggage system. Manual operation is not allowed. Door activation shall only be through the associated

baggage system, refer to "Description of Operations" as specified in this section for operational sequence requirements.

- 3. Curtains: At locations not visible to the public, provide interlocking slats of cold roll formed galvanized steel. At locations visible to the public, provide interlocking slats of stainless steel. Gauge to be as recommended by manufacturer to withstand applicable impact from the baggage system or other forces. Endlocks shall be attached to the slats to maintain curtain alignment and prevent lateral slat movement in accordance with manufacturer's recommendations. Curtain shall be reinforced with a bottom bar consisting of two steel angles or a box shape.
- 4. Guides: Shall be roll formed steel shapes or structural steel angles as recommended by the manufacturer. Attachment to jamb shall be in accordance with manufacturer's recommendations.
- 5. Brackets: Shall be steel plate to support the barrel, counterbalance, and hood, and shall be equipped with self-aligning lubricated ball bearings.
- 6. Counterbalance: Shall be helical torsion springs housed in a steel pipe barrel, supporting the curtain with a maximum deflection of .03 inches per foot of width. Counterbalance shall be adjustable by means of an adjusting tension wheel.
- 7. Hood: Shall be 24 gauge galvanized primed steel minimum. Hood shall be equipped with thermally controlled internal galvanized steel flame baffle when required.
- 8. Locking: Gearing shall be self-locking.
- 9. Fire Rated Doors: Where a fire rated door is required herein or as indicated on the drawings, the door shall be rated as indicated, but it shall not close automatically when a fire is detected unless specifically required by code or noted otherwise. The door shall operate as indicated in "Description of Operations" in this specification section. Fire doors shall be labeled by "Underwriter's Laboratory" or other testing laboratory acceptable to local code authorities. Fire doors shall be provided with fusible links that if in the event of a fire and the fire is present at the door location, the door will close. If the door closes due to the fusible link, the conveyor section(s) at the door shall stop immediately. All other doors and conveyor sections shall function as indicated in the "Description of Operations."
- 10. Motor Operation: Shall include 120 volt AC, single phase, high torque motor; reduction gearing; solenoid break; emergency operation; overload protection; and prewiring terminal block. Door shall be activated by the associated baggage system, refer to "Description of Operations" in this section for system sequence. Emergency operation shall be activated a security access control system card reader, furnished, and installed within this contract, or a key operation if the card reader is not provided.
- 11. Controls: Provide limit switches or photosensors to identify when door is closed, partially open, and fully open. Switches shall be heavy duty, industrial type. Photosensors shall be as specified herein. Limit switches or photosensors shall be monitored by the associated

baggage system and security access control system through the baggage control system. Coordinate baggage system and security access control system for controls interface requirements.

2.5 BHS ELECTRICAL AND LOW LEVEL CONTROLS – GENERAL:

- 2.5.A. General:
 - 1. Materials shall be of the quality specified herein, new, free from defects, of the best commercial/industrial grade, and approved by a nationally recognized testing laboratory wherever published standards exist. Each type of material shall be of the same make and manufacturer throughout the project. Materials shall comply with NEC or Local Code requirements, whichever are more stringent.
 - 2. The electrical equipment identified herein is based on products by different manufacturers and indicates the level of quality and performance required for the equipment. Provided that the equipment is equal in quality and performance to that identified herein and meets the requirements of these contract documents, electrical equipment by Allen Bradley, Siemens, Schneider Electric/Square D, Cutler Hammer, General Electric, Westinghouse, or approved equal is acceptable for use in this Work.
 - 3. Contractor shall provide either NEMA or IEC components, as listed herein, but shall provide either NEMA or IEC components for any type of component throughout the Work (no intermixing of components), unless noted otherwise or with approval by the Owner or OAR.
 - 4. The final detailed electrical designs as provided by the turnkey project Contractor shall be performed by a Professional Electrical Engineer licensed in the State of New Hampshire or by those under the direct responsible control of the engineer and the design shall be certified/sealed by said NH-registered Professional Engineer.
 - 5. In addition to the provisions below, general DIVISION 16 ELECTRICAL Specifications for basic electrical work and electrical general notes have been included in the Contract Documents as minimum of facility requirements and basis of design; however, the final electrical work and component requirements shall be determined by the design Engineer of Record in accordance with all applicable laws, codes, industry standards, and best practices.

2.5.B. Raceways and Fittings:

 Except as otherwise noted, all electrical wiring from the motor control panel to the conveyor shall be enclosed in conduit of trade size ³/₄" or larger. Individual conductors and cables that are not acceptable exposed cable or cord sets on the conveyors shall be enclosed in conduit of trade size ³/₄" or larger. Conduit shall be in compliance with NEC or Local Code requirements, whichever are more stringent. Except in public areas, conduit shall be installed exposed in locations selected to prevent damage to conduit by moving vehicles or equipment. In public areas, conduit runs shall be inconspicuous by running under cover plates, behind conveyors, or otherwise concealed from public view. Conduit shall be EMT above 7' 0" AFF. Conduit shall be rigid galvanized below 7' 0". Raceways shall be concealed in public and finished areas. Raceways shall be run parallel with or at right angles to the building lines. Conduits shall be grouped as practical. Provide flex connections to motor control panels. Wiring shall be installed only after conduits have been cleaned and belled. Conduits shall be sized in accordance with NEC or Local Code requirements, whichever are more stringent.

- 2. All flexible conduit, where used, shall be in compliance with NEC or Local Code requirements, whichever are more stringent. Flexible conduit shall be connected from wall mounted, ceiling mounted, floor mounted, or trapeze mounted conduit to conveyor sections and to motors.
- 3. Rigid Steel Conduit: Hot-dip galvanized. All conduit greater than 1.5" diameter shall be rigid steel conduit, unless noted otherwise.
 - a. Conduit Fittings:
 - 1) Unions: Threaded-type, Erickson, or split couplings.
 - 2) Locknuts: Steel up to two-inch; malleable iron for 2-1/2 inch and larger.
 - 3) Bushings: Cadmium-plated malleable iron for 1/2 to 1 inch; phenolic-insulated type for 1-1/4 inch and larger. Note: Aluminum fittings shall not be used.
- 4. Electrical Metallic Tubing (EMT): Galvanized or sheradized. Minimum size shall be ³/₄". All conduit 1.5" diameter or less and not susceptible to damage shall be EMT, unless noted otherwise.
 - a. EMT Fittings: Couplings and connectors shall be steel compression-ring type, rain tight and concrete tight.
- 5. Flexible Conduit: Galvanized steel, securely interlocked, minimum size 1/2 inch.
 - a. Flexible Conduit Connectors: Cast metal, clamp style. Screw-in type connectors are not acceptable.
- 6. Wireway: Hinged cover, baked enamel finish, size as required.
- 7. Raceway Supports:
 - a. Surface-mounted: 1-hole, malleable iron, hot-dip-galvanized straps.
 - b. Pendant-mounted: For single units, 1/4-inch rod with pear-shaped hanger; for multiple raceways or wireways, trapeze-type hanger with 3/8-inch rod, 1-5/8 inch square performed channel and pipe clamps.
- 2.5.C. Wire and Cable:
 - 1. All conductors shall be copper and in accordance with NEC or Local Code requirements, whichever are more stringent. Low voltage (less than 90 volts) control wiring shall be
installed in separate wireways and not combined with power or control (greater than 90 volts) wiring. Control wiring shall be installed in separate wireways and not combined with power wiring. Control wiring shall be terminated, where necessary, in junction boxes on terminal boards, make wire numbers on terminal strips. The term "conductor" as used in these specifications shall be considered as any wire cord, cable, rod, buss, fuse, or similar product designed for the transmission of electrical energy.

- 2. Conductors for Motor Control Only Exterior to Motor Control Panels:
 - a. Individual conductors shall be Type THHN/THWN-2 for all wet and dry indoor locations and shall be Type XHHW-2 for exterior locations. Conductors shall be 600-volt insulation, stranded copper, Class "B" stranding, no solid conductors allowed. All power conductors shall be 12 AWG, minimum. All control wiring shall be No. 14 AWG, minimum. Grounding conductors: #6 AWG and larger: stranded copper, bare soft drawn as required. #8 AWG and smaller: stranded copper with green insulation.
 - b. Power cord sets shall be Type STOOW for all wet and dry indoor locations. Conductors shall be 600-volt insulation, stranded copper, Class "B" stranding, no solid conductors allowed. All power conductors shall be 12 AWG, minimum. All control wiring shall be No. 14 AWG, minimum. Grounding conductors: #6 AWG and larger: stranded copper, bare soft drawn as required. #8 AWG and smaller: stranded copper with green insulation. This cord type is not required to be installed in conduit. It shall either be secured to the conveyor such that it is not loose, hanging, or coiled outside of an electrical enclosure or device; or install in an approved open wireway/cable tray.
- Conductors Motor Control Only: Interior to Motor Control Panels, conductors shall be Type MTW, 600-volt insulation, stranded copper, Class "B" stranding, no solid conductors allowed. Motor feeders shall be sized as required. All power conductors shall be 12 AWG, minimum. Control wire shall be 14 AWG, minimum.
- 4. Conductors for All Area Except Motor Control: Conductors shall be 600-volt. Wiring shall be run in conduit, except where specified or indicated otherwise, and conductors shall not be less than No. 12 AWG except for control wiring in conduit, which may be NO. 14 AWG and fire alarm wiring, which may be No. 16 AWG. Wire shall be furnished in types to conform to the following:
 - a. Thermoplastic Type THWN (for fire alarm circuit only): Type THWN shall bear Underwriter Laboratories approval. Conductors shall be solid. Wire shall meet the requirement of IPCEA Standards S-61-402 Copper.
 - b. Thermoplastic Type THHN/THWN-2: Type THHN/THWN-2 wire shall bear Underwriters Laboratories approval. Conductors shall be stranded having IPCEA Class "B" stranding. Wire shall meet the requirements of IPCEA Standards S-61-402 Copper.
 - c. S.O. Cord: Shall be 600-volt, heavy-duty, Type W, as manufactured by ITT, or approved equal. Size as required. This cord type is not required to be installed in conduit. It shall

either be secured to the conveyor such that it is not loose, hanging, or coiled outside of an electrical enclosure or device; or install in an approved open wireway/cable tray.

- d. Cord sets shall be Type STOOW for all wet and dry indoor locations. Conductors shall be 600-volt insulation, stranded copper, Class "B" stranding, no solid conductors allowed. All power conductors shall be 12 AWG, minimum. All control wiring shall be No. 14 AWG, minimum. Grounding conductors: #6 AWG and larger: stranded copper, bare soft drawn as required. #8 AWG and smaller: stranded copper with green insulation. This cord type is not required to be installed in conduit. It shall either be secured to the conveyor such that it is not loose, hanging, or coiled outside of an electrical enclosure or device; or install in an approved open wireway/cable tray.
- e. VFD Power Cabling: Shall be 600-volt, heavy-duty, shielded cable with drain wire. Size as required. Type shall be as recommended by the VFD manufacturer.
- f. Ground Wire: Ground wire shall be insulated copper with green insulation.
- 5. Color Coding: Baggage system phase wire colors to be: for 277/480-volt--Phase A, brown; Phase B, orange; Phase C, yellow. For 120-volt wire in control panel, red. For 480-volt wire in control panel, black. All panel wires shall have wire numbers at both ends of the wire. For DC voltage, all wire shall be blue with wire numbers both inside and outside of panels. For 120-volt AC outside of the control panel, wire may be any color except brown, orange, yellow, or blue; neutral shall be white; the color of the wire must be consistent between panels and devices, and must be identified by wire numbers. Verify conductor color code with local electrical inspector. Where colors are not available (No. 4 and larger, or by special permission of the Owner), all wires shall be identified within panel boards, cabinets, switchboards, and other accessible locations, using Manville Dutch Brand No. 128 vinyl marking tape with color to match coding of phase wires. Wire markings shall be Brady number tape or sleeve-type number markers.
- 6. Manufacturer: Belden Cable, General Cable, Rome Cable, or equal.
- 7. Electric Tape: All taping of electrical connections shall be done with #M Scotch No. 33 plus all-weather vinyl plastic tape, or equal.
- 2.5.D. Boxes and Fittings:
 - 1. Outlet and Device Boxes: One-piece pressed steel, electro-galvanized, size and depth required by code except four inch square or four inch octagonal minimum. Provide bushings or thwarted fitting on conduits without bushings.
 - 2. Junction and Pull Boxes: Steel, screw cover, code gage and size, baked enamel finish. Junction boxes used for splicing shall be 12" x 12" minimum and contain terminal strip for all splice joints. An exception is where one or more photoelectric sensors are spliced and all components are easily accessible with wire fill shall be limited to 31% in accordance with NEC and without moving wires out of the way, a 4-11/16 junction box can be used, provided that the proper terminal strip assembly is provided. Terminal strip assembly shall include, but

is not limited to; terminal blocks, mounting rail, end barrier, end anchors, jumpers (if necessary), fanning strip (if necessary), and marking system. Minimum size for all other junction boxes or pull boxes not used for splicing shall be 4 11/16" x 2 1/8" deep.

- 3. Fittings: Junction boxes shall be cast conduit fittings at the Contractor's option. Provide one size larger than raceway for feeders, with "mogul-type" openings. Openings shall be accessible at all times. Conduit bodies (condulets) shall be cast and limited to "LB", "LL", and "LR" types. Wire fill shall be limited to 31% in accordance with NEC.
- 2.5.E. Photoelectric Cell (PEC) Sensors:
 - 1. General: Self-contained, infra-red visible beam with a range of 6" to 30 feet. The unit shall include mounting brackets, cable, and reflector. All components shall be UL Listed.
 - 2. All photosensors used for jam detection, over height bag detection, etc., shall be L.E.D. Retroreflective Type devices.
 - 3. Construction: Sensor heads shall be molded from thermoplastic polyester with a lexan top view window. Lenses shall be acrylic and hardware shall be stainless steel. The units shall be gasketed. Operating temperature range shall be -40 to 150°F.
 - 4. Connection: Integral standard 4 conductor quick disconnect cable fitting. Connect to fitting with matching connector and flex conduit and wire. Connecting cable and fittings shall be UL listed.
 - 5. Mounting Bracket: Special by manufacturer with curved mounting slots and two 5/16" mounting bolts.
 - 6. Photosensors shall be mounted on structural members attached to the machinery structure so that minimal vibration is transmitted to these units. No more than two penetrations per sensor (one each for the photosensor and the reflector) shall be allowed in conveyor sideguards; each penetration shall not exceed 1 1/2" in diameter and shall be beveled to remove sharp edges.
- 2.5.F. Warning Visual Systems:
 - 1. Warning Lights (Beacon):
 - a. System Start up: Light shall be a rotating, 120 volt AC, flat base mounting fixture with a red lens. Location as indicated on drawings.
 - b. Jam Detection/Emergency Stop: Light shall be a rotating, 120 volt AC, flat base mounting fixture with a yellow lens. Location as indicated on drawings.
 - 2. Warning Light (Lantern):
 - a. Globe and guard. Globe color shall be as required.

- 3. Stacked Lights:
 - a. Stacked lights shall be of standard design with stackable white, red, yellow, green, and blue lights in arrangements and quantity of colors and lights as required herein, in the Baggage Contract Documents, and/or per required standards.
- 2.5.G. Warning Audible Systems:
 - 1. Warning Horn:
 - a. In Baggage Make up areas and along baggage system as shown on the Baggage System Contract Drawings, furnish and install warning horns. Horns shall be 120 volts AC, 103 dB at 10' with adjustable volume.
 - 2. Warning Buzzer:
 - a. At each claim device furnish and install a minimum of two audible alarms located within the device. Chime/buzzer shall be 120 volts AC, 65 to 70 dB at 10'.
 - b. Control Station Buzzer:
 - 1) At each control station with a START pushbutton in public areas, furnish and install a buzzer in the control station. Buzzer shall be 60/250 volts AC with 120 volt AC supplied to the unit to provide 55 to 60 dB at 2'.
- 2.5.H. Control Stations:
 - 1. Control stations shall be multi pushbutton/selector station with labels for each operation. Enclosure shall be a NEMA type 4/13 pushbutton station, or approved equal. All control stations other than START and E STOP stations for conveyor sections in public view shall be located on adjacent conveyor sections out of public view and labeled for the conveyor section being controlled.

2.5.I. Disconnect Switches:

- At each motor furnish and install a heavy duty, 380V, 3 Phase, NEMA 1 Disconnect Switch with auxiliary contact to report status of disconnect to PLC for system monitoring. For motors with clutch/brakes, the disconnect shall shut off motor and clutch/brake simultaneously and have an auxiliary contact to report status of disconnect to PLC for system monitoring. Disconnects and assembly shall be lockable, UL listed, and comply with NEC or Local Code requirements, whichever are more stringent. Mount motor disconnect switch on trunk of conveyor below belt line adjacent to motor. Label disconnect switch with black phenolic, white incised identification label.
- 2. Disconnect Switches for Motors with VFDs: For motors with VFDs, provide a disconnect switch with a "Break before Main Break" auxiliary contact to signal VFD activate "Coast to Stop" operation to safely shut down the VFD prior to the motor being disconnected. For

motors/VFDs not requiring a quick disconnect, type shall be Hubbell "Circuit-Lock HBLDS3VFD Disconnect with Early Break Auxiliary Contacts" or approved equal.

3. Quick Disconnect Switches for Motors with VFDs: For motors with VFDs, provide a disconnect switch with a "Break before Main Break" auxiliary contact to signal VFD activate "Coast to Stop" operation to safely shut down the VFD prior to the motor being disconnected. For motors/VFDs requiring a quick disconnect, type shall be Hubbell "Circuit-Lock HBL2430SW Disconnect with Early Break Auxiliary Contacts" or approved equal.

PART-3 EXECUTION

3.1 GENERAL:

3.1.A. Prior to the work of this section, carefully inspect the work of all other trades and sections and verify that all such work is complete to the point where the work may properly commence.

3.2 EXAMINATION:

- 3.2.A. BHSC's Quality Control Requirements:
 - 1. Comply with applicable provisions of Division 01 Section 01 40 00 "Quality Requirements" for requirements for BHSC Quality Control Program
 - 2. General Requirements:
 - a. Workmanship: The Work shall be of acceptable quality and be performed by personnel skilled in their trade in accordance with the approved quality control/assurance plans. BHSC will correct any defective work at their own expense.
 - b. BHSC is responsible to examine conditions under which baggage system work will be installed and notify the Owner in writing of any unsatisfactory conditions.
 - c. Inspection: Work under this contract shall be subject to inspection by the Owner's representative to ensure conformity with the drawings, specifications, and contract terms. Cooperate with the Owner's representative and provide assistance at all times for the inspection of the electrical work performed under this contract. Remove covers, operate equipment, conduct insulation tests, or perform all reasonable work, which in the opinion of the Owner's representative, would be necessary to determine the quality and adequacy of the work performed.
 - d. Site Interfaces: BHSC shall be responsible for the following:
 - 1) Protecting Baggage Handling System equipment.
 - 2) Covering and protecting Baggage Handling System equipment from debris and dirt.
 - 3) Removing daily erection debris and discarded materials.

- 4) Equipment staging area (will be assigned by GC).
- 5) Coordinating the work schedule with GC.
- 6) Means for loading, transport, unloading and staging of all BHS related materials onsite.

3.3 MECHANICAL INSTALLATION:

3.3.A. General:

- 1. Install the conveyor equipment true and properly aligned, complete in all details, in accordance with the specifications and manufacturers' recommendations, and as indicated on the drawings.
- 2. Finish all slider bed and sideguard joints smooth and free from snags and protrusions, which, could damage baggage or otherwise cause the system to jam.
- 3. All rollers and bearings shall be easily accessible for removal. Assemble all equipment in a manner to facilitate routine maintenance.
- 4. All stairways, catwalks, crossovers, handrails, fences, working platforms, etc., shall be painted OSHA safety yellow.
- 3.3.B. Installation Tolerances:
 - 1. Gaps between end rolls shall be as required by code.
 - 2. Uneven joints in conveyor sideguards, static guides, and static deflectors shall be epoxy filled and ground smooth to eliminate all snag points.
 - 3. Where sideguards break for ATR or other conditions, downstream sideguard design must incorporate flare to avoid jams and snags.
- 3.3.C. Welded Construction:
 - 1. Provide welded connections for fabrication and installation of work wherever bolted connections are not required for subsequent removal or for normal operation, adjustment, inspection, maintenance, and replacement of worn parts. Comply with AWS standards for workmanship and for qualifications of welding operators.
 - 2. Attachments to steel beams shall be clamped. Attachments to concrete slabs shall be with drilled expansion anchors sized for the load with adequate safety factors and not exceeding 3" in depth. Attachments to concrete beams shall be with drilled expansion anchors into the sides of beams only and placed a minimum of 6" up from the bottom of beam. All attachments shall be submitted for approval.

- 3. Replace fireproofing materials to an equal depth as the existing fireproofing at attachment locations. Fireproofing shall be of the same type and brand as the existing.
- 3.3.D. Belting:
 - 1. Mechanically spliced:
 - a. All belt lacing must be Clipper type, No. 2 or No. 1 sized based upon belt manufacturer's specifications.
 - b. Belt lacing must be installed to prevent damage.
 - c. Belting material and the related lacing must be trimmed to provide a 45-degree 3/4" deep V-notch at the corners.
 - d. All belts must be installed as continuous belting with laced joints. No "dutchmans" are allowed.
- 3.3.E. BHS Component Identification:
 - 1. All conveyor sections and other BHS components must be labeled with 6" tall stencils identifying their equipment numbers, generally in the vicinity of the drive section. Conveyor IDs must match as-built documents and controls system identification and be clearly visible from normal maintenance access side of conveyor and not obstructed by motors, control panels, other equipment, or obstructions. Label conveyor ID on both sides of conveyor where useful for maintenance identification. Color and format of conveyor IDs must be approved by the OAR.

3.4 ELECTRICAL/CONTROLS INSTALLATION:

- 3.4.A. General:
 - 1. Controls/Electrical Drawings:
 - a. Drawings shall be submitted for review and approval. Controls/electrical work as identified herein shall not be started without approved shop drawings.
 - 1) Wire numbers shall identify all wiring shown on controls/electrical drawings.
 - 2) All equipment shall be properly labeled on controls/electrical drawings.
 - 3) All equipment and wiring contacts shall be properly cross-referenced for easy review and installation.
 - 4) Fuses to be identified by wiring diagram rung ID.

- 3.4.B. Wire and Cable Identification:
 - 1. Field electric wire and cable shall be color coded and shall have the wire numbers as shown on the electrical drawings affixed to both ends of each wire, and every 5'-0" apart throughout the length of each wire and cable. Coding shall be as follows:
 - a. Power Wiring Line Side: This code applies to all field power wiring from source to the line side of the fuse in the Motor Control Panel. The neutral, if applicable, shall terminate at the terminal board.
 - 1) Phase "A" (120/208) Black (277/480) Brown
 - 2) Phase "B" (120/208) Red (277/480) Orange
 - 3) Phase "C" (120/208) Blue (277/480) Yellow
 - 4) Neutral (120/208) White (277/480) Gray
 - 5) Mech. Ground (120/208) Green (277/480) Green
 - b. Power and Control Wiring Load Side: The code for field power and control wiring from the load side of the fuses in the Motor Control Panel to all other devices shall be as follows:
 - 1) Power Black
 - 2) A.C. Control Red
 - 3) D.C. Control Blue
 - 4) Neutral White
 - 5) Mech. Ground Green
 - 2. Communications system wiring: Installation and termination of wiring shall follow premise wiring and horizontal cabling specifications. Cabling shall be properly labeled, supported, and terminated per industry standards. Cable routing of shall be neat and dressed out in appearance with adequate service loops and proper Velcro tie straps where applicable.
- 3.4.C. Electrical Equipment Labeling:
 - 1. Labeling shall comply with Specification Division 26 for Electrical Identification requirements and per the Baggage System Contract Documents.
 - 2. It is the intent to have the complete electrical system clearly and properly labeled to indicate the loads served and the function of each item of equipment provided under this Work.

- 3. Control panels, control stations, disconnect switches and junction or pull boxes for other than branch circuit wiring shall be provided with a securely attached engraved label. Provide labels for Owner-furnished control equipment installed on this project. Photocells shall have their assigned number neatly stenciled, in white paint, with two-inch high letters, on the conveyor frame next to the photocell.
- 4. Label all wiring with the appropriate wire number on both ends of the wire, i.e., at terminal boards, relay terminals, splices, etc. Wire numbering shall reflect the wire numbers used on the wiring diagrams of the electrical/control drawings.
- 5. Label all components within control panels, identifying the unit by the numbers given on the schematics.
- 6. Identify control station functions with legend plates attached to the controller unit and nameplates for each device as shown in quotes on the schematics.
- 7. All motor numbers shall be at least four inches high, neatly stenciled on the conveyor sideguard next to the motor. Paint color shall be white.
- 8. The main switchboard breakers, fire alarm equipment cabinets, distribution panel schedules, disconnect switches and junction or pull boxes for other than branch circuit wiring shall be labeled with a phenolic-engraved nameplate securely attached with rivets or contact cement.
- 9. Label all computer and network equipment to match the nameplates given in the as-built drawings.
- 10. Systems that are renamed shall have identities updated at all locations (Panels, J-Boxes, Circuit Breakers, Contactors, Overloads, etc.). Dual names for old and new components would be acceptable for interim systems.
- 3.4.D. Motor and Equipment Connections:
 - 1. General: Provide all motor and equipment connections as required herein, on the baggage system drawings, and as required by NEC for a complete operational system.
 - 2. Disconnect Switches: Provide disconnects at all motors and equipment items unless the equipment has a self-contained, code-approved disconnecting method. Mount disconnect switches on sideguard adjacent to motor and clutch/brake, where possible, and as close as practical to the device being controlled. Provide auxiliary supports as required. Label disconnect switches with the system and motor number. Disconnect switches shall be provided for all clutch/brakes. Either the motor disconnect switch shall be of a type and size to disconnect the motor and the clutch/brake or two disconnects shall be provided. Disconnect switches shall be UL listed.
- 3.4.E. Photoelectric Cells:
 - 1. Fasten all photoelectric cells and mounting hardware with hex head bolts and Esna stop nuts. Mount photoelectric cells associated with conveyor belt systems no more than one and a half

(1.5) inches above the belt surface. Provide necessary openings on sideguards of belt conveyors. All openings in sideguards shall be ground smooth, to prevent bag damage. Mount photocell reflectors in such a way as to protect them from damage from bags, etc.

- 3.4.F. Control Stations:
 - 1. Provide all necessary auxiliary mounting hardware to install remote-mounted control stations as indicated in the document. Location of control stations in public view shall be field verify with the OAR prior to rough-in.
 - 2. Control station locations indicated in design documents are approximate. Prior to rough-in verify approval of all proposed locations on site with the OAR. Conditions at site walk for approval must acknowledge installation of all elements impacting location of controls, such as motors, gearboxes, control panels and/or boxes along conveyors, maintenance access crossovers, etc. BHSC must relocate control stations if the OAR finds changed conditions that impact placement of previously approved control stations.
- 3.4.G. Emergency Stops:
 - 1. E-Stop Device shall be provided at each operator control station, unless determined not necessary by risk assessment as per NFPA 70E/EN ISO 13850.
 - 2. E-Stop Device shall be provided at locations required by risk assessment (e.g., conveyor access points, loading/unloading areas (man/machine interface points), etc.) as per NFPA 70E/EN ISO 13850.
 - 3. Emergency stops shall be located with unobstructed access and capable of safe activation by anyone needing to activate the device as per NFPA 70E/EN ISO 13850.
 - 4. Emergency stop should be mounted between 24" (600mm) to 66" (1700mm) above the access level (e.g., finish floor, top of slab, platform, etc.) as per NFPA 70E/EN ISO 13850. If this is not possible due to site conditions, it shall be identified in RFI to OAR for review and possible acceptance.
 - 5. Emergency stops shall be located along conveyors such that an E-Stop is no farther away than 25 feet for anyone along or in the BHS to shut down the BHS operation.

3.5 AS-BUILT DRAWINGS:

3.5.A. In addition to the requirements for As-Built Record Drawings in Specification Section 01 78 08, BHSC shall provide As-Built Record Mechanical and Electrical Drawings for the baggage systems, in hardcopy and electronic format, which shall consist of BHSC's final shop drawings with all corrections complete. Hand marked information on these copies is not acceptable. Each MCP shall have a hardcopy of its associated electrical as-built record drawings.

3.6 TESTING AND COMMISSIONING:

3.6.A. Refer to Part 4 for All Testing and Commissioning.

3.7 DEFICIENCIES:

- 3.7.A. BHSC shall track all deficiencies found during installation and testing in a tabular form with dates, descriptions, locations, correction by, and correction status. This deficiency list shall be submitted to the OAR on a weekly basis during installation and testing in electronic excel or CSV format.
- 3.7.B. Owner's staff and OAR will also track all deficiencies observed during installation and operation in tabular form with dates, descriptions, locations, correction by, and correction status and will provide the deficiency list following their onsite observation walk-throughs or testing observations.
- 3.7.C. Deficiency tracking software package can be used and is recommended for the project. Software to be accepted by OAR.
- 3.7.D. BHSC shall correct all deficiencies in the timely manner and prior to final acceptance.

3.8 ACCEPTANCE OF SYSTEM:

- 3.8.A. Conditional Acceptance (Beneficial Use):
 - 1. The following shall be required for total system(s) conditional acceptance:
 - a. Satisfactorily pass the tests as outlined herein and required by the Owner.
 - b. All submittals have been accepted with either "No Exceptions Taken" or "Make Correction Noted" as the status of the submittal. No "Revise and Resubmit" or "Rejected" submittals remain open.
 - c. Resulting Punch List of installation and testing are relatively minor in nature and do not prevent Beneficial Use of the system(s).
- 3.8.B. Final Acceptance:
 - 1. Final acceptance of the system(s) shall require the BHSC to have completed all Punch list items to the satisfaction of the Owner and OAR
 - 2. The OAR will attend one initial demonstration/observation and one follow-up demonstration/observation. Any cost for additional observations required to "clean up" Punch list items will be at the BHSC's expense.

3.9 WARRANTY:

3.9.A. Refer to Part 5 for Warranty.

3.10 START-UP SUPPORT:

3.10.A. Activation Support for Cutovers:

- 1. Baggage System Contractor shall provide 10 hours of on-site mechanical, electrical, and programming support for one (1) day immediately following the cutover of a subsystem. Time of support shall be coordinated with hours of operation. Programming may be performed on-line, provided that on-site staff can support programming efforts.
- 3.10.B. Live Bag Operations.
 - 1. Baggage System Contractor shall provide 10 hours of on-site mechanical, electrical, and programming support for one day immediately following live bag operation in Checked Baggage Inspection System (CBIS). Time of support shall be coordinated with hours of operation. Programming may be performed on-line, provided that on-site staff can support programming efforts.
- 3.10.C. Baggage Portering during phase cutovers:
 - 1. Owner will provide portering from the existing baggage conveyor to the make-up area during the MU-5 and MU-1 service outages. Contractor shall coordinate construction work with baggage handling operations to provide unrestricted access for porters during periods of outbound baggage inspections.

3.11 CLEANING:

3.11.A. Pre-Installation:

- 1. Stored BHS equipment must be kept clean from dirt, rust, and debris. The BHSC is responsible to provide any necessary means to protect/maintain equipment to prevent build-up of dirt and debris from storage area.
- 3.11.B. During Installation:
 - 1. Installed BHS equipment must be kept clean from dirt and debris. Conveyor, slope-plate and flat-plate recirculating devices, and other BHS components can be damaged if operated with construction dust, dirt, and/or debris on moving parts, so the BHSC is responsible to provide any necessary means to protect/maintain equipment to prevent build-up of dirt, rust, and debris from general construction.
 - 2. During installation, the BHSC and/or its subcontractor shall clean the debris in each motor safety disconnect, junction box, control station and MCP before closing each enclosure and/or panel.

3.11.C. Post Installation:

- 1. Prior to startup of the belt conveyors, polish and buff the bed surface smooth and free of sharp edges, dirt, paint, and grease. Apply a coating of talc powder between the surfaces of the bed and the belt.
- 2. BHSC shall completely clean baggage system equipment prior to turning it over to the Owner and shall protect the equipment from dirt and debris after it has been cleaned until it is turned over to the Owner for use.

PART-4 TESTING AND COMMISSIONING:

4.1 GENERAL TESTING:

- 4.1.A. BHSC and its subcontractors shall perform any needed testing and inspection of equipment, materials, functions, or processes to ensure quality control standards are met to the project expectations.
- 4.1.B. Electrical Tests:
 - 1. Testing shall comply with Specification Division 26 requirements.
 - 2. Test all wiring and connections for continuity and grounds before any equipment is connected. Where such tests indicate faulty insulation or other defects, locate, repair, and test all such defects and faults and test again. Check the direction of rotation and the lubrication of all motors after final service connections have been made.
 - 3. Check proper operation of all control relays, the programmable controller, timing relays, photocells, and motor starters in cooperation with the Owner's representative.
 - 4. Refer to testing and commissioning sections herein for additional requirements.

4.2 BHSC INTERNAL SITE TESTING:

- 1. Testing prior to Commissioning:
 - 1) The following tests, at a minimum, shall be performed:
 - a) Static Inspection:
 - (1) Mechanical.
 - (2) Electrical.
 - (3) Motor Control Panel.
 - b) Dynamic Inspection:
 - (1) Mechanical.
 - (2) Electrical.
 - c) Functional Inspections:
 - (1) E-Stops.
 - (2) Bag Jams.

- (3) Other Controls.
- (4) Basic Functions.
- d) Run-In Period.
- e) General Site Requirements.
- 2. BHSC Internal Site Test Plan:
 - a. The BHSC shall provide and submit for review and approval a Test Plan for each system(s), which shall, at minimum, incorporate the requirements listed above in the BHSC Internal Site Testing section in this Specification. Refer to Submittal requirements identified herein.
 - b. The BHSC is required to develop and submit for review and approval a Test Plan for each system to identify and demonstrate all System Control Functions. The Test Plan is to list each Control Station, Control Devices, etc., and its related control function that is to be demonstrated/tested in a checklist format with "Pass" and "Fail" check boxes, date, and recorder's initials for each item. Items that fail during a test shall be retested after corrections are made and another checklist shall be used in the test recording of the previously failed items. BHSC shall provide Owner with all checklists produced during testing.
- 3. Test Failure:
 - a. A failure during any test period shall be defined as any design characteristic or malfunction of the BHSC furnished equipment or materials that damages baggage or reduce any operating rate below those specified. Conditions resulting from improper loading of baggage or loading baggage of sizes not included in the Specification requirements will not be considered as failures.
- 4.2.B. Commissioning Demonstration and Observation:
 - 1. The Owner and/or Owner's Representatives will attend one initial demonstration/observation and one follow-up demonstration/observation. Any cost for additional observations required to "clean up" punchlist items will be at the BHSC's expense.
 - 2. After installation and testing of the complete system(s), its operating capability shall be demonstrated by the BHSC. All "debugging" shall have been accomplished prior to the start of the system(s) commissioning. The demonstration and observation shall include:
 - a. Static Observation: Observe the mechanical and electrical static components and identify deficiencies on the punchlist.
 - b. Dynamic Observation: Observe the mechanical and electrical dynamic components and identify deficiencies on the punchlist.

- c. Demonstrate the operational controls and safety devices of the system(s).
- d. Demonstrate E-Stop Zoning operations.
- e. Demonstrate Bag Jam and Cascade Stop operations.
- f. Demonstration of system(s) Fault Monitoring, System Status Panel.
- g. BHSC shall demonstrate the operation and functionality of all computer and PLC programming.
- h. BHSC shall demonstrate all interfaces with other systems. BHSC shall coordinate interface demonstration with all parties involved.

PART-5 GENERAL WARRANTY:

5.1 WARRANTY PERIOD:

- 5.1.A. The warranty period for the Baggage Handling System shall commence upon Beneficial Use of any system or subsystem.
- 5.1.B. The warranty period for the entire Baggage Handling System shall extend for a period of one (1) year from the date of Beneficial Use of the system or subsystem with the Owner's option to enter into two one (1) year extensions.
- 5.1.C. Manufacturer's warranties on equipment that are longer than the system warranty shall be turned over to the Owner and documented in the warranty agreement.

5.2 WARRANTY REQUIREMENTS:

5.2.A. In addition to the warranty requirements of the General Conditions and Specification Section 01 78 10; the warranty shall comply with the following requirements. The baggage handling system(s) shall be warranted jointly and severally, on a single document, by the Baggage Systems Contractor, Installer, and Designer/Manufacturer for complete operating baggage systems as specified herein and agreeing to repair or replace defective materials and workmanship of the work during the warranty period, which starts on the date of beneficial use or substantial completion, whichever occurs first. Defective materials and workmanship is hereby defined to include operational failure, performance below required minimums, excessive deterioration or aging, abnormal wear considering intensity of use, unsafe conditions, excessive noise or vibration and similar unusual, unexpected and unsatisfactory conditions; In the event that the above defects occur within the warranty period, the BHSC shall repair or replace the defective item(s) and assume full costs of labor and materials for such replacement. Replacement item(s) shall be new and meet the requirements of this specification. The above does not include defects caused by acts of nature, alterations, abusive use, vandalism, and similar cases beyond the control of the Baggage Systems Contractor, Installer, and Designer/Manufacturer.

5.3 **DESIGN FAILURE:**

- 5.3.A. In the event that a design failure occurs during the warranty period, the BHSC shall redesign/re-select and replace all components, assemblies, and/or devices utilized in and contributing to the failed design at no cost to the Owner. Submit proposed redesign shop drawings and component data sheets to Owner's representative for approval. BHSC shall provide a new warranty period for the system upon the correction of such design failure. Components, assemblies, and/or devices shall be considered as design failures if any of the following occurs during the warranty period:
 - 1. Inappropriate action of control system components during operational conditions.
 - 2. Discovering of an imminent safety hazard or occurrence of an accident during operational conditions attributable to the design of the system. Occurrence of an accident shall be investigated and determination on the cause of the accident shall be performed a third party.

a. Failure to meet "System Reliability" requirements herein after the system has been run in.

5.4 WARRANTY PROCEDURES:

- 5.4.A. BHSC shall submit their standard warranty procedures that conform to the requirements of their warranty department. Owner may add additional requirements to meet the Airport's maintenance department needs. Warranty procedures shall include, but not limited to, the following:
 - 1. Conditions for Claims (scheduled, imminent, and emergency).
 - 2. Repairs made by the Owner's personnel.

END OF SECTION