

*CHARLOTTESVILLE-
ALBEMARLE
AIRPORT*

*BAGGAGE HANDLING
SYSTEMS UPGRADES*

ISSUED FOR BID

PROJECT MANUAL

FEBRUARY 28, 2024



*CHARLOTTESVILLE-
ALBEMARLE
AIRPORT*

*BAGGAGE HANDLING
SYSTEMS UPGRADES*

ISSUED FOR BID

February 28, 2024
Charlottesville, VA

RS&H No.:
2054-1892-008

Prepared by RS&H, Inc. at the
direction of the Charlottesville-
Albemarle Airport



**TECHNICAL SPECIFICATIONS FOR
CHARLOTTESVILLE ALBEMARLE AIRPORT
BAGGAGE HANDLING SYSTEMS UPGRADES**

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**CHARLOTTESVILLE ALBEMARLE AIRPORT AUTHORITY BOARD
CHARLOTTESVILLE ALBEMARLE AIRPORT**

INVITATION TO BID

PROJECT DESCRIPTION: **BAGGAGE HANDLING SYSTEMS UPGRADES**
BID DUE DATE: **April 3rd , 2024, 2:00 PM Local Time**

Sealed bids will be received by the **Charlottesville Albemarle Airport Authority**, at 100 Bowen Loop, Suite 200, Charlottesville, VA 22911, until 2:00 PM (local time), on the bid date. On the bid date at 2:30 PM, all bids will be publicly opened and read aloud.

ANY BID RECEIVED AFTER THE SPECIFIED TIME WILL NOT BE CONSIDERED.

The proposed Work includes the following:

Replacement of existing inbound and outbound baggage handling conveyor systems, including baggage claim device, baggage make-up carousel, and related electrical and communications work to support the replacement in kind of the existing systems.

Bidder Qualifications:

Bidder shall be a licensed contractor experienced in the design, manufacture, installation, and testing of baggage handling systems.

A non-mandatory Pre-Bid Conference for this project will be held on March 21, 2024, at 10:00 am (local time) via Microsoft Teams Video Conferencing AND in-person in the Airport Conference Room, located at 100 Bowen Loop, Suite 200, Charlottesville, VA 22911. Please email the Project Manager, Keith M. Nix, PE at keith.nix@rsandh.com to receive the Microsoft Teams link for the virtual meeting.

Bidders may request electronic copies of the Contract Documents (proposal forms, specifications, drawings) via e-mail. Inquiries should be directed to the Project Manager, Keith M. Nix, PE via email at keith.nix@rsandh.com and Beth Church at beth.church@rsandh.com.

Each Bidder is individually responsible for the careful examination of the site of the proposed Work, the Proposal, Plans, General Provisions, Technical Specifications, Contract Forms, and all requirements of the project. The failure or omission by any Bidder to do so shall in no way relieve any Bidder from any obligation with respect to its bid. The Authority reserves the following rights: to accept or reject any or all bids; and to award the Contract to the most responsive and responsible Bidder whose bid is determined by the Authority to be in its best interest. Any and all proposals as submitted herein are subject to further negotiation at the option of Authority. No contract or agreement of any kind arising out of this proposal and/or negotiations shall be binding or valid against the Authority, its department, officers, employees, or agents unless such contract or agreement is in writing, has been authorized by the Charlottesville Albemarle Airport Authority, and signed by the Airport Director or his designee.

The Charlottesville-Albemarle Airport Authority, 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 any contract entered into pursuant to this advertisement, disadvantaged business enterprises will be afforded full and fair opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, or national origin in consideration for an award.

**CHARLOTTESVILLE ALBEMARLE AIRPORT AUTHORITY BOARD
CHARLOTTESVILLE ALBEMARLE AIRPORT**

INSTRUCTIONS TO BIDDERS

I. GENERAL

A. This project is to be financed by the Federal Aviation Administration (FAA). Award of Contract is subject to the approval of these agencies, and availability of funding.

B. Compliance with Law

1. The Bidder covenants and agrees that he/she and his/her agents and employees will comply with all municipal, state, and federal laws, applicable national and local codes, County rules and regulations applicable to the work to be conducted under this Agreement and that he/she shall obtain all necessary permits, pay all required fees and taxes, and otherwise perform these services in a legal manner. County rules and regulations are available on request. The Bidder is assumed to be familiar with all federal, state, and local laws, ordinances, County rules and regulations that in any manner affect the work. Ignorance on the part of the Bidder will in no way relieve him/her from responsibility.
2. Bidder certifies that all material, equipment, etc., contained in his/her proposal meets all OSHA requirements.

C. General Bond Requirements:

1. The Proposal Guaranty shall be as specified; only the Proposal Bond and Surety's Bond Affidavit as bound within these documents or a Cashier's Check is acceptable. Each separate proposal shall be accompanied by a Cashier's Check or Proposal Bond on the form provided herein in the amount of 10 percent (10%) of the total amount bid, made payable to Charlottesville Albemarle Airport Authority. If a Proposal Bond is provided in lieu of a Cashier's Check, it must be accompanied by a valid Power of Attorney indicating that the person signing the bond on behalf of the Surety has full legal authority to do so.
2. The amount of such bond or the check of the Bidder whose proposal is accepted shall be forfeited and paid to the Owner as liquidated damages if said Bidder fails to enter into a Contract with the Owner and to furnish the required executed Contracts, Certificates of Insurance and Performance and Payment Bonds within fifteen (15) calendar days after the date of the Notice of Award and Acceptance of the proposal.
3. Contract Payment and Performance Bonds shall be as specified; only the Payment and Performance Bonds and Surety's Bond Affidavit as bound within these Contract Documents are acceptable.

D. Insurance Requirements:

1. Insurance requirements shall be as specified in Special Conditions, Section 2, herein.

II. NONDISCRIMINATION

- A. The Equal Employment Opportunity Report Statement, Certification of Nonsegregated Facilities, Equal Opportunity Clause, and all other EEO requirements shall be included in all nonexempt subcontracts entered into by the Contractor. Subcontracts entered into by Contractor shall also include all other applicable labor provisions. No Subcontract shall be awarded to a noncomplying Subcontractor.
- B. Affirmative Action: If the Contract is an aviation-related activity as defined in 14 CFR Part 152, and is a Construction Contract of \$10,000.00 or more, Contractor assures that it will undertake an Affirmative Action Program as required by 14 CFR Part 152, Subpart E, to ensure that no person shall, on the grounds of race, creed, color, national origin, or sex, be excluded from participating in or receiving the services or benefits of any program or activity covered by this subpart. Contractor assures that it will require that its covered suborganizations provide assurances to the Contractor that they similarly will undertake Affirmative Action Programs and that they will require assurances from their suborganizations, as required by 14 CFR Part 152, Subpart E to the same effect.
- C. In addition, the Bidder will also insert in each of his/her subcontracts a clause requiring the Subcontractor to include these provisions in any lower tier subcontracts which they may enter into, together with a clause requiring this insertion in any further subcontracts that may in turn be made.

III. QUALIFICATION OF BIDDERS

- A. Qualification of Bidders shall be as described in the Proposal Forms herein.

IV. EXAMINATION OF CONDITIONS AFFECTING WORK

- A. Prior to submitting a proposal, each Bidder shall examine and thoroughly familiarize themselves with all existing conditions, including all applicable laws, codes, ordinances, rules, and regulations that will affect his work. Bidders shall visit the project site, examine the grounds and all existing buildings, utilities, pavements, and systems, and shall ascertain all conditions that will in any manner affect work. Bidders shall ask the Architect/Engineer, in writing, for any additional information deemed necessary for them to be fully informed as to exactly what is to be expected prior to submitting a proposal.
- B. The Owner will make available during normal business hours, at its offices, record documents and drawings pertaining to Charlottesville Albemarle Airport. These record documents and drawings shall not be considered a part of the Contract Documents. Record documents and drawings have been maintained by the Owner solely for the Owner's own benefit, and do not necessarily indicate all existing conditions fully or accurately. Bidders shall be solely responsible for all assumptions made in reliance upon record documents and drawings.

V. INTERPRETATIONS

- A. Each Bidder shall carefully examine the plans and the Contract Documents and all Addenda or other revisions and thoroughly familiarize himself with the detailed requirements prior to submitting a proposal. Should a Bidder find discrepancies or ambiguities in, or omission from, the Contract Documents, or should he/she be in doubt as to their meaning, he/she shall at once,

and in any event, not later than seven days prior to receipt of bid, notify the Architect/Engineer in writing who will send written Addenda to all Bidders where necessary. Bidders shall not be entitled to rely upon any oral instructions or interpretations by the Architect/Engineer. All Addenda sent to Bidders will become a part of the Contract Documents. All written technical inquiries shall be directed to RS&H, Inc., 2600 Park Tower Drive, Suite 101, Vienna, Virginia 22180, Attention Keith M. Nix, PE, (904) 256-2424, keith.nix@rsandh.com. No allowance will be made after proposals are received for oversight by Bidder.

VI. SUBSTITUTIONS

- A.** The materials, products and equipment described in the Contract Documents establish a standard of required function, dimension, appearance, and quality to be met by any proposed substitution. The Contractor is responsible for assuring that all supplies, Subcontractors, and vendors conform to the Contract requirements.
- B.** No substitution will be considered prior to receipt of bids unless written request for approval has been submitted in the proper format not less than seven (7) days prior to the receipt of bids. The burden of proof of the merit of the proposed substitution is upon the Bidder. The Architect/Engineer's decision of approval or disapproval of a proposed substitution is final.

In making requests for substitutions, the Bidder shall list the particular system, product, or material he wishes to substitute, and the justification for such a request. Request submitted shall include any and all adjustments of that and any other work affected thereby.

- C.** If the Architect/Engineer approves any proposed substitution prior to receipt of bids, such approval will be set forth in an Addenda. Bidders shall not rely on approvals made in any other manner.
- D.** No substitutions will be considered after the receipt of bids except as specifically provided for in the Contract Documents.

VII. PREPARATION AND SUBMISSION OF PROPOSAL

- A.** Sealed proposals for the construction of the project generally described will be received until the time and date stated in the "Invitation to Bid."
- B.** The proposal shall be on the "Proposal Forms" provided; no other forms are acceptable.
- C.** Due to the allocation of funds, successful Bidders will be required to provide verified breakdown of costs of work in a manner acceptable to the Architect/Engineer and Owner.
- D.** Each proposal submitted shall be placed in a sealed opaque envelope plainly marked with the project numbers, 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, shall be enclosed in an additional envelope, and sent by registered mail with return receipt requested. The Owner will in no way be responsible for delays caused by the U.S. Postal service or any other deliverer of the proposal, or for delay caused by any other occurrence. No proposal will be considered unless received on or before the time and at the

place designated in the "Invitation to Bid." Proposals received after the specified opening time shall be returned to the Bidder unopened. The envelope shall contain the signed original.

- E.** The Bidder must submit his/her proposal on the forms furnished by the Owner. All blank spaces in the proposal forms must be correctly filled in where indicated.
- F.** Proposals shall be submitted as indicated in the "Proposal Form" and shall be signed in ink by an official of the firm submitting the proposal.
- G.** Erasures or other changes in a proposal shall be explained or noted over the signature of the Bidder.
- H.** Proposals containing reservations, conditions, omissions, unexplained erasures or alternations, items not required in the bid or irregularities of any kind may be rejected by the Owner.
- I.** Each proposal shall indicate the full business name and address of the Bidder and shall be signed by him/her with his/her usual signature.
- J.** A proposal submitted by a partnership shall list the names of all partners and shall be signed in the partnership name by one of the members of the partnership.
- K.** A proposal submitted by a corporation shall be executed in the legal name of the corporation and signed by the President or Vice President. The name of each person signing the proposal shall be typed or printed below the signature.
- L.** When requested by the Owner, a Power of Attorney or other satisfactory evidence of the authority of the officer signing on behalf of the corporation shall be furnished for the Owner's records.
- M.** The Bidder must supply all information required.
- N.** The proposal must be accompanied by a Proposal Bond and Surety's Bond Affidavit executed on the forms provided or a Cashier's Check payable to the Owner in an amount equal to not less than five percent (5%) of the bid. If a Bidder withdraws its proposal within **90 days** from the date on which bids are opened, or if a Bidder is awarded the Contract but fails, refuses, or neglects to execute the Contract or to furnish acceptable and required Certificates of Insurance, and Payment and Performance Bonds within 15 days after receipt of written Notice of Award and Acceptance, then the amount of this bond or check shall be paid to or retained by the Owner as liquidated damages.

END OF SECTION

**CHARLOTTESVILLE ALBEMARLE AIRPORT AUTHORITY BOARD
CHARLOTTESVILLE ALBEMARLE AIRPORT**

PROPOSAL FORM

TO: Charlottesville Albemarle Airport Authority Board
100 Bowen Loop, Suite 200
Charlottesville, Virginia 22911

PROJECT: **Baggage Handling System Upgrades**

AIRPORT'S REPRESENTATIVE (to be contacted for additional information on this Proposal):

_____ Jason Devillier (Name)	_____ (434) 973-8342 (Telephone Number)
------------------------------------	---

BIDDER: _____

BIDDER'S ADDRESS: _____

DATE: _____

BIDDER'S REPRESENTATIVE (to be contacted for additional information on this Proposal):

_____ (Name)	_____ (Telephone Number)
-----------------	-----------------------------

BIDDER'S DECLARATION AND UNDERSTANDING

The undersigned, hereinafter called the Bidder, declares that the only persons, or parties interested in this Bid are those named herein, that this Bid is, in all respects, fair and without fraud, that it is made without collusion with any official of the Owner, and that the Bid is made without any connection or collusion with any person submitting another Bid on this Contract.

The Bidder further declares that no member of the surety, partner for copartners or a firm, directly or indirectly owns more than five (5) percent of the total assets or capital stock of the bidding entity, nor will directly or indirectly benefit by more than five (5) percent from the profits or emoluments of this Contract. (For purposes of this paragraph, indirect ownership or benefit does not include ownership or benefit by a spouse or minor child.)

The Bidder further declares that he has carefully examined the Specifications and that this Bid is made according to the provisions and under the terms of the Specifications, which Specifications are hereby made a part of this Bid.

The undersigned hereby declares, as Bidder, that this Proposal is made on the behalf of

_____ (CONTRACTOR)

and no others without collusion on the part of any person, firm or corporation, that he/she has examined the site of the Work, the Plans, Specifications and Form of Agreement and materials related thereto, and he/she proposes and agrees that if his/her bid as submitted in the attached Proposal schedule be accepted he/she will enter into a Contract to perform all the Work required and to complete the same within the stipulated time; and that the Bidder will accept in full payment therefore the prices named in said Proposal schedule. Said prices are to include, and cover the furnishing of all materials, except as otherwise provided in the Specifications, the performing of all the labor requisite or proper, and the providing of all necessary machinery, tools, apparatus, and other means of construction; and the performance and completion of all the Work in the manner set forth, described, and shown in the Specifications or on the drawings for the Work and in the form of agreement.

Enclosed herewith is the Proposal Guaranty in the form specified in Section 20 of the General Provisions which is submitted as a guarantee of the good faith of the Proposal. The Bidder agrees that, upon receipt of notice to award, he/she will, within 15 days, execute the Contract in accordance with the Proposal as accepted, and satisfy the Contract bonding and insurance requirements stipulated in Section 30 of the General Provisions; and that upon his/her failure or refusal to do so, the Proposal Guaranty accompanying his/her bid shall be forfeited to and become the property of the OWNER as liquidated damages for such failure or refusal.

ADDENDA

The Bidder hereby acknowledges that he/she has received the following Addenda:

<u>Addenda No.</u>	<u>Dated</u>
_____	_____
_____	_____
_____	_____
_____	_____

TAXES

The Bidder agrees that any applicable Federal, State and Local sales and use taxes, are included in the stated bid prices. It is the responsibility of the Contractor to determine whether sales taxes are applicable. The Contractor is liable for any applicable taxes which are not included in the stated bid prices.

NOTE: THE BID PRICES SET FORTH ON THE ATTACHED SHEETS SHALL BE CONSIDERED FIRM BIDS NOT SUBJECT TO PRICE ADJUSTMENT.

SIGNATURE ACKNOWLEDGES THAT: (Check One)

_____ Bid is in full compliance with the Specifications.

Signature also acknowledges that Bidder has read the Airport's Purchasing Policies and agrees that the provisions thereof shall apply to this bid.

(CORPORATE SEAL)

ATTEST:

BIDDER:

Signature

Signature

By: _____

By: _____

Title: _____

Title: _____

**CHARLOTTESVILLE ALBEMARLE AIRPORT AUTHORITY BOARD
CHARLOTTESVILLE ALBEMARLE AIRPORT**

PROPOSAL AFFIDAVIT

The following affidavit must be executed in order that your Proposal may be considered.

STATE OF _____)

COUNTY OF _____)

_____ of lawful age, being first duly sworn, upon his/her oath, deposes and says: That he/she executed the accompanying Proposal on behalf of the Contractor therein named, and that he/she had lawful authority so to do, and said Contractor has not directly or indirectly, entered into any agreement, expressed or implied, with any Contractor or Contractors, having for its object the controlling of the price or amount of such Proposal or any Proposals, the limiting of the Proposal of Contractors, the parceling or farming out to any Contractor or Contractors, to other persons of any part of the Contract or any of the subject matter of the Proposals, or of the profits thereof, and that he/she has not and will not divulge the sealed Proposal to any person whomsoever; except those having a partnership or other financial interest with him in said Proposal or Proposals, until after the sealed Proposal or Proposals are opened.

Signed: _____

Subscribed and sworn to before me this ____ day of _____, 20__.

My Commission Expires:

Notary Public

**CHARLOTTESVILLE ALBEMARLE AIRPORT AUTHORITY BOARD
CHARLOTTESVILLE ALBEMARLE AIRPORT**

PROPOSAL GUARANTY

(Not to be filled in if a Cashier's check is submitted)

KNOW ALL MEN BY THESE PRESENTS: That the undersigned Bidder, _____, as Principal, and firmly bound unto the Charlottesville Albemarle Airport Authority Board in the sum of _____ dollars (\$ _____), for the payment of which, well and truly to be made, we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors and assigns.

THE CONDITION OF THIS OBLIGATION is such that if Principal:

- 1. Does not withdraw the attached Proposal of _____ dollars (\$ _____) for the improvement of Charlottesville Albemarle Airport for a period of ninety (90) days after the date on which the bids are opened; and
- 2. Enters into the written contract and furnishes the required Certificates of Insurance, Payment and Performance Bonds, with Surety or Sureties acceptable to the Charlottesville Albemarle Airport Authority Board, within fifteen (15) days after notice that the said Proposal is accepted, then this obligation shall be void; otherwise the same shall be in full force and the full amount of this Proposal Bond shall be paid to the Charlottesville Albemarle Airport Authority Board as stipulated herein as liquidated damages.

Signed this ____ day of _____, 20____.

(PRINCIPAL MUST INDICATE WHETHER CORPORATION, PARTNERSHIP, COMPANY OR INDIVIDUAL)

Principal

THE PERSON SIGNING FOR THE PRINCIPAL SHALL, IN HIS/HER OWN HANDWRITING, SIGN THE PRINCIPAL'S NAME, HIS/HER OWN NAME AND HIS/HER TITLE. WHERE THE PERSON SIGNING FOR A CORPORATION IS OTHER THAN THE PRESIDENT OR VICE PRESIDENT, HE/SHE MUST FURNISH A CORPORATE RESOLUTION SHOWING HIS/HER AUTHORITY TO BIND THE CORPORATION.

By: _____

Title

(Affix Surety's Corporate Seal)

Surety

**CHARLOTTESVILLE ALBEMARLE AIRPORT AUTHORITY BOARD
CHARLOTTESVILLE ALBEMARLE AIRPORT**

SURETY'S BOND AFFIDAVIT

STATE OF _____)

COUNTY OF _____)

BEFORE ME, THE UNDERSIGNED AUTHORITY, personally appeared _____ who, being duly sworn, deposes and says that he/she is a duly authorized (resident) (non-resident) insurance agent, properly licensed under the laws of the State of _____, and the Commonwealth of Virginia, to represent _____ of _____, a company authorized to make corporate surety bonds under the laws of the Commonwealth of Virginia (the "Surety").

Said _____ further certifies that as agent or attorney-in-fact for the said Surety, he/she has signed the attached bond in the sum of _____ (U.S. \$ _____) on behalf of _____ To the Charlottesville Albemarle Airport Authority Board covering the construction of the **Baggage Handling Systems Upgrades** project.

Said _____ Further certifies that the premium on the said bond is \$ _____ which will be paid in full directly to the Surety or to him as agent or attorney-in-fact, and included in his/her regular commission as agent or attorney-in-fact, for the execution of said bond and that his/her commission will not be divided with anyone except to _____ who is a duly authorized insurance agent properly licensed under the laws of the Commonwealth of Virginia.

COUNTERSIGNED:

SURETY

Virginia Resident Agent

Attorney-in-fact

Address of Resident Agent

Acknowledgement for Attorney-in-fact

Address of Bond Company

Sworn to and subscribed before me
This ____ day of _____ 20____.

Phone Number

Notary Public, State of _____

My Commission Expires: _____

Fax Number

**CHARLOTTESVILLE ALBEMARLE AIRPORT AUTHORITY BOARD
CHARLOTTESVILLE ALBEMARLE AIRPORT**

**EQUAL EMPLOYMENT OPPORTUNITY (EEO) REPORT STATEMENT
as Required by 41 CFR 60-1.7 (b)**

The Bidder (proposer) shall complete the following statement by checking the appropriate boxes. Failure to complete these blanks may be grounds for rejection of bid.

1. The Bidder (proposer) has () has not () developed and has on file at each establishment Affirmative Action Programs pursuant to 41 CFR 60-1.4 and 41 CFR 60-2.
2. The Bidder (proposer) has () has not () participated in any previous Contract or Subcontract subject to the Equal Opportunity Clause prescribed by Executive Order 10925, or Executive Order 11114, or Executive Order 11246.
3. The Bidder (proposer) has () has not () filed with the Joint Reporting Committee the annual compliance report on Standard Form 100 (EEO-1 Report).
4. The Bidder (Proposer) has () has not () submitted all compliance reports in connection with any such Contract due under the application filing requirements; and that representations indicating submission of required compliance reports signed by proposed Subcontractors will be obtained prior to award of subcontracts.
5. The Bidder (Proposer) does () does not () employ fifty (50) or more employees.

If the Bidder (Proposer) has participated in a previous Contract subject to the equal opportunity clause and has not submitted compliance reports due under applicable filing requirements, the Bidder (Proposer) shall submit a compliance report on Standard Form 100, "Employee Information Report EEO-1" prior to the award of Contract.

Standard Form 100 is normally furnished to Contractors annually based on a mailing list currently maintained by the Joint Reporting Committee. In the event a Contractor has not received the form, he/she may obtain it by writing to the following address:

Joint Reporting Committee
1800 G Street
Washington, DC 20506

(Name of Bidder)

By: _____
Signature*

Title: _____

Date: _____

*Must be same signature on Bid Proposal

**CHARLOTTESVILLE ALBEMARLE AIRPORT AUTHORITY BOARD
CHARLOTTESVILLE ALBEMARLE AIRPORT**

NON-COLLUSION AFFIDAVIT

STATE OF _____)

COUNTY OF _____)

_____, being first duly sworn, deposes and says that:

1. (S)He is _____ of _____, the Bidder that has submitted the attached Bid;

2. (S)He is fully informed respecting the preparation and contents of the attached Bid and of all pertinent circumstances respecting such Bid;

3. Such Bid is genuine and is not a collusive or sham Bid;

4. Neither the Bidder nor anyone acting on behalf of the Bidder, including this affiant, has in any way colluded, conspired, connived, or agreed, directly or indirectly with any other Bidder, firm or person to submit a collusive or sham Bid in connection with the Contract for which the attached bid has been submitted or to refrain from bidding in connection with such Contract, or has in any manner, directly or indirectly, sought by agreement or collusion or communication or conference with any other Bidder, firm or person to fix the price or prices in the attached Bid or of any other Bidder, or to fix any overhead, profit or cost element of the Bid price or the Bid price of any other Bidder, or to secure through any collusion, conspiracy, connivance or unlawful agreement any advantage against the Charlottesville Albemarle Airport Authority Board or any person interested in the proposed Contract; and,

5. The price or prices quoted in the attached Bid are fair and proper and are not tainted by any collusion, conspiracy, connivance, or unlawful agreement on the part of the Bidder or anyone acting on his/her/its behalf.

(Signature)

(Title)

Subscribed and Sworn to before me of this ____ day of _____,
20____.

(Notary's Signature)

(Notary's Stamped or Printed Name)

Notary Public, in and for _____
County, _____.

My commission expires:

**CHARLOTTESVILLE ALBEMARLE AIRPORT AUTHORITY BOARD
CHARLOTTESVILLE ALBEMARLE AIRPORT**

BIDDER'S QUALIFICATIONS

In accordance with Federal Aviation Administration (FAA) General Provision 20-02 Prequalification of Bidders, each bidder 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 prequalified 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 prequalification may be submitted as evidence of financial responsibility in lieu of the certified statements or reports hereinbefore specified.

All questions must be answered and the data given must be clear and comprehensive. This statement must be notarized. If necessary, questions may be answered on separate attached sheets. This bidder may submit any additional information he desires.

1. Projects applied for: _____

2. Name of Bidder: _____

3. Date Submitted: _____

4. Bid Numbers: _____

5. Date of Opening: _____

6. Submitted by: Individual Corporation Partnership

7. Principal Office Address: _____

8. Office Phone: _____

9. (Corporation Only)

Date of Incorporation: _____

State: _____

Capitalisation (paid in rash): _____

Virginia Business License Number: _____

Officers

President: _____

Vice President: _____

Secretary: _____

Treasurer: _____

10. (Partnership Only)

Date of Organization: _____

Type: (General) (Limited)

Partnership

Name: _____

Address: _____

Name: _____

Address: _____

Virginia Business License Number: _____

11. Attach evidence of SCC registration, contractors licenses, business licenses, and FEIN.

12. How many years has your organization been in business as a contractor under your present business name?

13. How many years' experience in this type of construction work has your organization had?

a. As a prime contractor? _____

b. As a sub-contractor? _____

14. If any part of the work is sublet, will you require a bond from sub-contractor?

(Yes) (No)

15. State approximately the largest amount of work you have done in any one calendar year

a. As a prime contractor? _____

b. As a sub-contractor? _____

16. Have you ever failed to complete any work awarded to you?

(Yes) (No)

If yes, state where and why.

17. Have you or any officer or partner of your Organization ever been a partner or officer of some other contracting organization?

(Yes) (No)

If YES, give the following information for each individual:

Name of Individual	Position	Name of Organization

18. Have you or has any director, officer, partner, general manager or any person otherwise active in the management of your organization ever been a director, officer, partner, general manager, or otherwise active in this management of some other (existing or defunct) organization during a time when such organization defaulted on a contract, either as a prime contractor or as a sub-contractor?

(Yes) (No)

If YES, state circumstances (use extra sheet, if necessary).

19. List Contracts with a construction value over \$2 million completed within the last 2 years.
(Attach additional sheets as necessary).

Contract	Amount	% Complete

20. List uncompleted contracts with a construction value over \$2 million completed held by you at present. (Attach additional sheets as necessary).

Contract	Amount	% Complete

21. What are the largest airport related projects your organization has completed?

Contract Amount	Class of Work	Date Completed	For Whom	References
				Name
				Address
				Tel:
				Email:
				Name
				Address
				Tel:
				Email:

I/we hereby certify that the statements of fact contained herein are correct to the best of my/our knowledge and belief; and that the statement entitled "Financial Position" presents fairly the financial position of the enterprise. I/we understand that if I/we knowingly make any false statements herein I am/we are subject to such penalties as may be prescribed by law or ordinance. Any depository, vendor, reference, or other agency named herein is authorized to supply the holder with any information necessary to verify this statement.

Note: A partnership must give firm name and signature of all partners. A corporation must give full corporate name and signature of two (2) officials (either president or vice-president and secretary or treasurer)	Firm or Corporate Name	
	Signature	Title
	Signature	Title
Date of Signing	Signature	Title

**CHARLOTTESVILLE ALBEMARLE AIRPORT AUTHORITY BOARD
CHARLOTTESVILLE ALBEMARLE AIRPORT**

Certification of Offer/Bidder Regarding Tax Delinquency and Felony Convictions

The applicant must complete the following two certification statements. The applicant must indicate its current status as it relates to tax delinquency and felony conviction by inserting a checkmark (✓) in the space following the applicable response. The applicant agrees that, if awarded a contract resulting from this solicitation, it will incorporate this provision for certification in all lower tier subcontracts.

Certifications

- 1) The applicant represents that it is () is not () a corporation that has any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability.

- 2) The applicant represents that it is () is not () a corporation that was convicted of a criminal violation under any Federal law within the preceding 24 months.

Note

If an applicant responds in the affirmative to either of the above representations, the applicant is ineligible to receive an award unless the sponsor has received notification from the agency suspension and debarment official (SDO) that the SDO has considered suspension or debarment and determined that further action is not required to protect the Government's interests. The applicant therefore must provide information to the owner about its tax liability or conviction to the Owner, who will then notify the FAA Airports District Office, which will then notify the agency's SDO to facilitate completion of the required considerations before award decisions are made.

Term Definitions

Felony conviction: Felony conviction means a conviction within the preceding twenty four (24) months of a felony criminal violation under any Federal law and includes conviction of an offense defined in a section of the U.S. code that specifically classifies the offense as a felony and conviction of an offense that is classified as a felony under 18 U.S.C. § 3559.

Tax Delinquency: A tax delinquency is any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted, or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability.

**CHARLOTTESVILLE ALBEMARLE AIRPORT AUTHORITY BOARD
CHARLOTTESVILLE ALBEMARLE AIRPORT**

CONSTRUCTION CONTRACT

THIS CONTRACT AND AGREEMENT, made and entered into this _____ day of _____, 20____, by and between

Charlottesville Albemarle Airport Authority Board
Charlottesville, Virginia

hereinafter referred to as the "OWNER" and _____
hereinafter referred to as the "CONTRACTOR," witnesseth:

That for and in consideration of the payment in the amount of \$_____ to be made in accordance with the price stipulated in the Proposal of the Contractor, attached, the Contractor hereby agrees to furnish all tools, labor, equipment, and materials, and to build and construct the certain project designated as:

Project Name: **Baggage Handling Systems Upgrades**
Project Location: **Charlottesville Albemarle Airport – Charlottesville, Virginia**

more specifically described in the Contract Documents and the Construction Plans, being attached hereto as fully as though copies in full herein, to the satisfaction of the project Owner and, in case the United States Government is participating in any portion of the cost of the Work, the Work shall also be subject to inspection and approval at all times by the appropriate federal agencies.

The Contractor agrees, for the consideration set forth in his/her Proposal for the Base Bid, to begin work within ten (10) calendar days after a Notice to Proceed is issued by the Owner and to complete the Work within the schedule indicated on the plans. If the Contractor shall fail to complete the Work within the time limit herein specified, he/she shall pay to the Owner, as liquidated damages, and not in the nature of a penalty, the sum of **\$2,500 for each calendar day delayed beyond the overall contract time.**

It is understood and agreed between the parties hereto that the said sum fixed as liquidated damages is reasonable in amount, considering the damages that the Owner will sustain in the event of any such delay, and said amount is herein agreed upon and fixed as liquidated damages, because of the difficulty of ascertaining the exact amount of damages that may be sustained by such delay. The said sum shall be deducted from the final amount of estimate due the Contractor.

The Contractor agrees that he/she shall keep fully informed of all federal and state laws, all local laws, ordinances, and regulations and all orders and decrees of bodies or tribunals having any jurisdiction or authority, which in any manner affect those engaged or employed on the Work, or which in any way affect the conduct of the Work. The Contractor shall at all times observe and comply with all such laws, ordinances, regulations, orders, and decrees; obtain at his/her expense all necessary permits; and shall protect, indemnify, and defend the Owner and all his/her officers, agents, or servants against any claim or liability arising from or based on the violation or any such law, ordinance, regulation, order, or decree, whether by himself or his/her employees.

It is agreed and understood between the parties hereto that the Contractor agrees to accept, and the Owner agrees to pay for the Work at the prices stipulated in said Proposal, such payment to be in lawful money of the United States, and the payment shall be made at the time and in the manner set forth in the Specifications.

WITNESS OUR HANDS, this ____ day of _____, 20____.

FOR THE OWNER:

FOR THE CONTRACTOR:

**Charlottesville Albemarle Airport Authority
Board**

(

By: _____
(Signature)

_____(Seal)
(Company Name)

(Name) (Title)

By: _____
(Signature)

(Name) (Title)

ATTEST

ATTEST

By: _____
(Signature)

By: _____
(Signature)

_____, Secretary

By: _____
(Signature)

(Signature)

* Contractor must indicate whether Corporation, Partnership, Company or Individual.

The person signing shall in his/her own handwriting sign the principal's name, his/her own name, and his/her title. Where the person signing for a corporation is other than the President or Vice President, he/she must, by affidavit, as contained herein show his/her authority to bind the corporation.

**CHARLOTTESVILLE ALBEMARLE AIRPORT AUTHORITY BOARD
CHARLOTTESVILLE ALBEMARLE AIRPORT**

PAYMENT BOND

STATE OF _____)

Bond No. _____

COUNTY OF _____)

KNOW ALL MEN BY THESE PRESENTS: That _____,
as principal, hereinafter called **Contractor**, and _____,
as **Surety**, hereinafter called Surety, are held and firmly bound unto the **Charlottesville Albemarle Airport Authority Board** as obligee, hereinafter called the **Owner**, in the amount of _____ dollars
(\$ _____) for the payment of which Contractor and Surety bind themselves, their heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

WHEREAS, Contractor has by written Agreement dated _____, 20____, entered into a Contract with Owner for the improvement of Williamsport Regional Airport in accordance with all of the Contract Documents listed in the General Provisions, Section 10 prepared for the **Charlottesville Albemarle Airport Authority Board**, which Contract is by reference made a part hereof and is hereinafter referred to as the Contract:

NOW THEREFORE, the condition of the above obligation is such that if the Contractor shall promptly make payments to all persons supplying labor, material, and supplies used directly or indirectly by the Contractor, or Subcontractor(s), in the prosecution of the Work provided for in said Contract, then this obligation shall be void, otherwise, the same shall remain in full force and effect.

The Surety hereby stipulates and agrees that any modification, omission, or addition, in or to the terms of the Contract, including the Plans and Specifications, therefore, shall not affect the obligation of said Surety under this Bond.

Signed and Sealed this _____ day of _____, 20____.

(PRINCIPAL MUST INDICATE
WHETHER CORPORATION, PARTNER-
SHIP, COMPANY, OR INDIVIDUAL)

(Principal)

THE PERSON SIGNING FOR THE PRINCIPAL SHALL, IN HIS/HER OWN HANDWRITING, SIGN THE PRINCIPAL'S NAME AND HIS/HER TITLE. WHERE THE PERSON SIGNING FOR A CORPORATION IS OTHER THAN THE PRESIDENT OR VICE PRESIDENT, HE/SHE MUST FURNISH A CORPORATE RESOLUTION SHOWING HIS/HER AUTHORITY TO BIND THE CORPORATION.

By: _____

Title: _____

(Affix Surety's Corporate Seal)

Surety

By: _____

Date: _____, 20____

Virginia Resident Agent

By: _____

Date: _____, 20____

(Attach "SURETY'S BOND AFFIDAVIT" on copy of form bound in these Specifications)

**CHARLOTTESVILLE ALBEMARLE AIRPORT AUTHORITY BOARD
CHARLOTTESVILLE ALBEMARLE AIRPORT**

SURETY'S BOND AFFIDAVIT

STATE OF _____)

COUNTY OF _____)

BEFORE ME, THE UNDERSIGNED AUTHORITY, personally appeared _____
who, being duly sworn deposes and says that he/she is a duly authorized (resident) (non-resident) insurance
agent, properly licensed under the laws of the State of _____,
and the Commonwealth of Virginia, to represent _____
of _____, a company authorized to make corporate surety bonds under the laws of
the Commonwealth of Virginia (the "Surety").

Said _____ further certifies that as agent or attorney-in-fact for the said Surety, he/she
has signed the attached bond in the sum of _____ dollars
(U.S. \$ _____) on behalf of _____ to the
Charlottesville Albemarle Airport Authority Board covering the Construction of the **Baggage
Handling Systems Upgrades** project.

Said _____ further certifies that the premium on the said bond is \$ _____
which will be paid in full directly to the Surety or to him as agent or attorney-in-fact, and included in his/her
regular commission as agent or attorney-in-fact, for the execution of said bond and that his/her commission
will not be divided with anyone except to _____
who is a duly authorized insurance agent properly licensed under the laws of the Commonwealth of
Virginia.

COUNTERSIGNED:

SURETY

Virginia Resident Agent

Attorney-in-Fact

Address of Resident Agent

Acknowledgment for Attorney-in-Fact

Address of Bond Company

Sworn to and subscribed before me this
day of _____, 20____.

Telephone Number: _____

Notary Public, State of _____

Fax Number: _____

My Commission Expires: _____

**CHARLOTTESVILLE ALBEMARLE AIRPORT AUTHORITY BOARD
CHARLOTTESVILLE ALBEMARLE AIRPORT**

PERFORMANCE BOND

STATE OF _____)

Bond No. _____

COUNTY OF _____)

KNOW ALL MEN BY THESE PRESENTS: That _____,
as principal, hereinafter called **Contractor**, and _____,
as **Surety**, hereinafter called Surety, are held and firmly bound unto the **Charlottesville Albemarle Airport Authority Board** as obligee, hereinafter called the Owner, in the amount of _____dollars
(\$ _____) for the payment of which Contractor and Surety bind themselves, their heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

WHEREAS, Contractor has by written Agreement dated _____, 20____, entered into a Contract with Owner for the improvement of Williamsport Regional Airport in accordance with all of the Contract Documents listed in the General Provisions, Section 10 prepared for the **Charlottesville Albemarle Airport Authority Board**, which Contract is by reference made a part hereof and is hereinafter referred to as the Contract, and:

NOW THEREFORE, the condition of the above obligation is such that if the said Contractor shall well and faithfully perform the things agreed by him to be done and performed according to terms of said Contract, then this obligation shall be void, otherwise the same shall remain in full force and effect.

The Contractor shall well and truly perform, carry out and abide by all the terms, conditions and provisions of said Contract and complete the Work therein specified in accordance with the terms thereof and in the event said Contractor fails to perform said Contract as aforesaid, it shall be the duty of the Surety herein to assume responsibility for the performance of said Contract and to complete the Work therein specified in accordance with the terms thereof; and the Surety herein shall and does hereby agree to indemnify the Owner and hold it harmless of, from and against any and all liability, loss, cost, damage or expense including reasonable attorney fees, engineering and architectural fees or other professional services which said Owner may incur or which may accrue or be imposed upon it by reason of any negligence, default, breach and/or misconduct on the part of said Contractor, and his/her agents, servants, Subcontractors and/or employees, in, about, or on account of such work and performance of said Contract and shall repay to and reimburse to the said Owner, promptly upon demand, all sums of money including reasonable attorney's, architect's, engineer's, and other professional services, each and every, reasonably paid out or expended by the said Owner on account of the failure and/or refusal of said Contractor to carry out, do, perform, and/or comply with any of the terms and provisions of said Contract at the time and in the manner therein provided, including, without limitation, the guarantee of the Work specified.

The Surety hereby stipulates and agrees that any modification, omission, or addition, in or to the terms of the Contract Documents shall not affect the obligation of said Surety under this Bond.

Signed and sealed this _____ day of _____, 20____.

(PRINCIPAL MUST INDICATE WHETHER CORPORATION, PARTNER-SHIP, COMPANY, OR INDIVIDUAL) _____

(Principal)

THE PERSON SIGNING FOR THE PRINCIPAL SHALL, IN HIS/HER OWN HANDWRITING, SIGN THE PRINCIPAL'S NAME AND HIS/HER TITLE. WHERE THE PERSON SIGNING FOR A CORPORATION IS OTHER THAN THE PRESIDENT OR VICE PRESIDENT, HE/SHE MUST FURNISH A CORPORATE RESOLUTION SHOWING HIS/HER AUTHORITY TO BIND THE CORPORATION.

By: _____

Title: _____

(Affix Surety's Corporate Seal)

Surety

By: _____

Date: _____, 20____

Virginia Resident Agent

By: _____

Date: _____, 20____

(Attach "SURETY'S BOND AFFIDAVIT" on copy of form bound in these Specifications)

**CHARLOTTESVILLE ALBEMARLE AIRPORT AUTHORITY BOARD
CHARLOTTESVILLE ALBEMARLE AIRPORT**

SURETY'S BOND AFFIDAVIT

STATE OF _____)

COUNTY OF _____)

BEFORE ME, THE UNDERSIGNED AUTHORITY, personally appeared _____
who, being duly sworn deposes and says that he/she is a duly authorized (resident) (non-resident) insurance
agent, properly licensed under the laws of the State of _____,
and the Commonwealth of Virginia, to represent _____
of _____, a company authorized to make corporate surety bonds under the laws of
the Commonwealth of Virginia (the "Surety").

Said _____ further certifies that as agent or attorney-in-fact for the said Surety, he/she
has signed the attached bond in the sum of _____ dollars

(U.S. \$ _____) on behalf of _____
to the **Charlottesville Albemarle Airport Authority Board** covering the Construction of the **Baggage
Handling Systems Upgrades** project.

Said _____ further certifies that the premium on the said bond is \$ _____
which will be paid in full directly to the Surety or to him as agent or attorney-in-fact, and included in his/her
regular commission as agent or attorney-in-fact, for the execution of said bond and that his/her commission
will not be divided with anyone except to _____
who is a duly authorized insurance agent properly licensed under the laws of the Commonwealth of
Virginia.

COUNTERSIGNED:

SURETY

Virginia Resident Agent

Attorney-in-Fact

Address of Resident Agent

Acknowledgment for Attorney-in-Fact

Address of Bond Company

Sworn to and subscribed before me this
day of _____, 20____.

Telephone Number: _____

Notary Public, State of _____

Fax Number: _____

My Commission Expires: _____

DRAFT AIA® Document A101® - 2017

Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum

AGREEMENT made as of the « » day of « » in the year « »
(In words, indicate day, month and year.)

BETWEEN the Owner:
(Name, legal status, address and other information)

« »
« »
« »
« »

and the Contractor:
(Name, legal status, address and other information)

« »
« »
« »
« »

for the following Project:
(Name, location and detailed description)

« »
« »
« »

The Architect:
(Name, legal status, address and other information)

« »
« »
« »
« »

The Owner and Contractor agree as follows.

ADDITIONS AND DELETIONS:
The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

The parties should complete A101®-2017, Exhibit A, Insurance and Bonds, contemporaneously with this Agreement. AIA Document A201®-2017, General Conditions of the Contract for Construction, is adopted in this document by reference. Do not use with other general conditions unless this document is modified.



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TABLE OF ARTICLES

- 1 THE CONTRACT DOCUMENTS**
- 2 THE WORK OF THIS CONTRACT**
- 3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION**
- 4 CONTRACT SUM**
- 5 PAYMENTS**
- 6 DISPUTE RESOLUTION**
- 7 TERMINATION OR SUSPENSION**
- 8 MISCELLANEOUS PROVISIONS**
- 9 ENUMERATION OF CONTRACT DOCUMENTS**

EXHIBIT A INSURANCE AND BONDS

ARTICLE 1 THE CONTRACT DOCUMENTS

The Contract Documents consist of this Agreement, Conditions of the Contract (General, Supplementary, and other Conditions), Drawings, Specifications, Addenda issued prior to execution of this Agreement, other documents listed in this Agreement, and Modifications issued after execution of this Agreement, all of which form the Contract, and are as fully a part of the Contract as if attached to this Agreement or repeated herein. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. An enumeration of the Contract Documents, other than a Modification, appears in Article 9.

ARTICLE 2 THE WORK OF THIS CONTRACT

The Contractor shall fully execute the Work described in the Contract Documents, except as specifically indicated in the Contract Documents to be the responsibility of others.

ARTICLE 3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

§ 3.1 The date of commencement of the Work shall be:

(Check one of the following boxes.)

- [« »] The date of this Agreement.
 - [« »] A date set forth in a notice to proceed issued by the Owner.
 - [« »] Established as follows:
(Insert a date or a means to determine the date of commencement of the Work.)
- [« »]

If a date of commencement of the Work is not selected, then the date of commencement shall be the date of this Agreement.

§ 3.2 The Contract Time shall be measured from the date of commencement of the Work.

§ 3.3 Substantial Completion

§ 3.3.1 Subject to adjustments of the Contract Time as provided in the Contract Documents, the Contractor shall achieve Substantial Completion of the entire Work:

(Check one of the following boxes and complete the necessary information.)

[« »] Not later than « » (« ») calendar days from the date of commencement of the Work.

[« »] By the following date: « »

§ 3.3.2 Subject to adjustments of the Contract Time as provided in the Contract Documents, if portions of the Work are to be completed prior to Substantial Completion of the entire Work, the Contractor shall achieve Substantial Completion of such portions by the following dates:

Portion of Work	Substantial Completion Date

§ 3.3.3 If the Contractor fails to achieve Substantial Completion as provided in this Section 3.3, liquidated damages, if any, shall be assessed as set forth in Section 4.5.

ARTICLE 4 CONTRACT SUM

§ 4.1 The Owner shall pay the Contractor the Contract Sum in current funds for the Contractor's performance of the Contract. The Contract Sum shall be « » (\$ « »), subject to additions and deductions as provided in the Contract Documents.

§ 4.2 Alternates

§ 4.2.1 Alternates, if any, included in the Contract Sum:

Item	Price

§ 4.2.2 Subject to the conditions noted below, the following alternates may be accepted by the Owner following execution of this Agreement. Upon acceptance, the Owner shall issue a Modification to this Agreement. *(Insert below each alternate and the conditions that must be met for the Owner to accept the alternate.)*

Item	Price	Conditions for Acceptance

§ 4.3 Allowances, if any, included in the Contract Sum: *(Identify each allowance.)*

Item	Price

§ 4.4 Unit prices, if any:

(Identify the item and state the unit price and quantity limitations, if any, to which the unit price will be applicable.)

Item	Units and Limitations	Price per Unit (\$0.00)

§ 4.5 Liquidated damages, if any:

(Insert terms and conditions for liquidated damages, if any.)

« »

§ 4.6 Other:

(Insert provisions for bonus or other incentives, if any, that might result in a change to the Contract Sum.)

« »

ARTICLE 5 PAYMENTS

§ 5.1 Progress Payments

§ 5.1.1 Based upon Applications for Payment submitted to the Architect by the Contractor and Certificates for Payment issued by the Architect, the Owner shall make progress payments on account of the Contract Sum to the Contractor as provided below and elsewhere in the Contract Documents.

§ 5.1.2 The period covered by each Application for Payment shall be one calendar month ending on the last day of the month, or as follows:

« »

§ 5.1.3 Provided that an Application for Payment is received by the Architect not later than the « » day of a month, the Owner shall make payment of the amount certified to the Contractor not later than the « » day of the « » month. If an Application for Payment is received by the Architect after the application date fixed above, payment of the amount certified shall be made by the Owner not later than « » (« ») days after the Architect receives the Application for Payment.

(Federal, state or local laws may require payment within a certain period of time.)

§ 5.1.4 Each Application for Payment shall be based on the most recent schedule of values submitted by the Contractor in accordance with the Contract Documents. The schedule of values shall allocate the entire Contract Sum among the various portions of the Work. The schedule of values shall be prepared in such form, and supported by such data to substantiate its accuracy, as the Architect may require. This schedule of values shall be used as a basis for reviewing the Contractor's Applications for Payment.

§ 5.1.5 Applications for Payment shall show the percentage of completion of each portion of the Work as of the end of the period covered by the Application for Payment.

§ 5.1.6 In accordance with AIA Document A201™–2017, General Conditions of the Contract for Construction, and subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

§ 5.1.6.1 The amount of each progress payment shall first include:

- .1 That portion of the Contract Sum properly allocable to completed Work;
- .2 That portion of the Contract Sum properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction, or, if approved in advance by the Owner, suitably stored off the site at a location agreed upon in writing; and
- .3 That portion of Construction Change Directives that the Architect determines, in the Architect's professional judgment, to be reasonably justified.

§ 5.1.6.2 The amount of each progress payment shall then be reduced by:

- .1 The aggregate of any amounts previously paid by the Owner;
- .2 The amount, if any, for Work that remains uncorrected and for which the Architect has previously withheld a Certificate for Payment as provided in Article 9 of AIA Document A201–2017;
- .3 Any amount for which the Contractor does not intend to pay a Subcontractor or material supplier, unless the Work has been performed by others the Contractor intends to pay;
- .4 For Work performed or defects discovered since the last payment application, any amount for which the Architect may withhold payment, or nullify a Certificate of Payment in whole or in part, as provided in Article 9 of AIA Document A201–2017; and
- .5 Retainage withheld pursuant to Section 5.1.7.

§ 5.1.7 Retainage

§ 5.1.7.1 For each progress payment made prior to Substantial Completion of the Work, the Owner may withhold the following amount, as retainage, from the payment otherwise due:

(Insert a percentage or amount to be withheld as retainage from each Application for Payment. The amount of retainage may be limited by governing law.)

« »

§ 5.1.7.1.1 The following items are not subject to retainage:
(Insert any items not subject to the withholding of retainage, such as general conditions, insurance, etc.)

<< >>

§ 5.1.7.2 Reduction or limitation of retainage, if any, shall be as follows:
(If the retainage established in Section 5.1.7.1 is to be modified prior to Substantial Completion of the entire Work, including modifications for Substantial Completion of portions of the Work as provided in Section 3.3.2, insert provisions for such modifications.)

<< >>

§ 5.1.7.3 Except as set forth in this Section 5.1.7.3, upon Substantial Completion of the Work, the Contractor may submit an Application for Payment that includes the retainage withheld from prior Applications for Payment pursuant to this Section 5.1.7. The Application for Payment submitted at Substantial Completion shall not include retainage as follows:
(Insert any other conditions for release of retainage upon Substantial Completion.)

<< >>

§ 5.1.8 If final completion of the Work is materially delayed through no fault of the Contractor, the Owner shall pay the Contractor any additional amounts in accordance with Article 9 of AIA Document A201–2017.

§ 5.1.9 Except with the Owner’s prior approval, the Contractor shall not make advance payments to suppliers for materials or equipment which have not been delivered and stored at the site.

§ 5.2 Final Payment

§ 5.2.1 Final payment, constituting the entire unpaid balance of the Contract Sum, shall be made by the Owner to the Contractor when

- .1 the Contractor has fully performed the Contract except for the Contractor’s responsibility to correct Work as provided in Article 12 of AIA Document A201–2017, and to satisfy other requirements, if any, which extend beyond final payment; and
- .2 a final Certificate for Payment has been issued by the Architect.

§ 5.2.2 The Owner’s final payment to the Contractor shall be made no later than 30 days after the issuance of the Architect’s final Certificate for Payment, or as follows:

<< >>

§ 5.3 Interest

~~Payments due and unpaid under the Contract shall bear interest from the date payment is due at the rate stated below, or in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.~~

~~(Insert rate of interest agreed upon, if any.)~~

<< >> % << >>

ARTICLE 6 DISPUTE RESOLUTION

§ 6.1 Initial Decision Maker

The Architect will serve as the Initial Decision Maker pursuant to Article 15 of AIA Document A201–2017, unless the parties appoint below another individual, not a party to this Agreement, to serve as the Initial Decision Maker.

(If the parties mutually agree, insert the name, address and other contact information of the Initial Decision Maker, if other than the Architect.)

<< >>

<< >>

<< >>
<< >>

§ 6.2 Binding Dispute Resolution

For any Claim subject to, but not resolved by, mediation pursuant to Article 15 of AIA Document A201–2017, the method of binding dispute resolution shall be as follows:

(Check the appropriate box.)

[] Arbitration pursuant to Section 15.4 of AIA Document A201–2017

[] Litigation in a court of competent jurisdiction

[] Other *(Specify)*

<< >>

If the Owner and Contractor do not select a method of binding dispute resolution, or do not subsequently agree in writing to a binding dispute resolution method other than litigation, Claims will be resolved by litigation in a court of competent jurisdiction.

ARTICLE 7 TERMINATION OR SUSPENSION

§ 7.1 The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of AIA Document A201–2017.

~~**§ 7.1.1** If the Contract is terminated for the Owner’s convenience in accordance with Article 14 of AIA Document A201–2017, then the Owner shall pay the Contractor a termination fee as follows:~~

~~*(Insert the amount of, or method for determining, the fee, if any, payable to the Contractor following a termination for the Owner’s convenience.)*~~

<< >>

§ 7.2 The Work may be suspended by the Owner as provided in Article 14 of AIA Document A201–2017.

ARTICLE 8 MISCELLANEOUS PROVISIONS

§ 8.1 Where reference is made in this Agreement to a provision of AIA Document A201–2017 or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

§ 8.2 The Owner’s representative:

(Name, address, email address, and other information)

<< >>
<< >>
<< >>
<< >>
<< >>
<< >>
<< >>

§ 8.3 The Contractor’s representative:

(Name, address, email address, and other information)

<< >>
<< >>
<< >>
<< >>
<< >>
<< >>
<< >>

§ 8.4 Neither the Owner's nor the Contractor's representative shall be changed without ten days' prior notice to the other party.

§ 8.5 Insurance and Bonds

§ 8.5.1 The Owner and the Contractor shall purchase and maintain insurance as set forth in AIA Document A101™–2017, Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum, Exhibit A, Insurance and Bonds, and elsewhere in the Contract Documents.

§ 8.5.2 The Contractor shall provide bonds as set forth in AIA Document A101™–2017 Exhibit A, and elsewhere in the Contract Documents.

§ 8.6 Notice in electronic format, pursuant to Article 1 of AIA Document A201–2017, may be given in accordance with AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, if completed, or as otherwise set forth below:

(If other than in accordance with AIA Document E203–2013, insert requirements for delivering notice in electronic format such as name, title, and email address of the recipient and whether and how the system will be required to generate a read receipt for the transmission.)

« »

§ 8.7 Other provisions:

« »

ARTICLE 9 ENUMERATION OF CONTRACT DOCUMENTS

§ 9.1 This Agreement is comprised of the following documents:

- .1 AIA Document A101™–2017, Standard Form of Agreement Between Owner and Contractor
- .2 AIA Document A101™–2017, Exhibit A, Insurance and Bonds
- .3 AIA Document A201™–2017, General Conditions of the Contract for Construction
- .4 AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, dated as indicated below:

(Insert the date of the E203-2013 incorporated into this Agreement.)

« »

.5 Drawings

Number	Title	Date

.6 Specifications

Section	Title	Date	Pages

.7 Addenda, if any:

Number	Date	Pages

Portions of Addenda relating to bidding or proposal requirements are not part of the Contract Documents unless the bidding or proposal requirements are also enumerated in this Article 9.

.8 Other Exhibits:

(Check all boxes that apply and include appropriate information identifying the exhibit where required.)

[« »] ~~AIA Document E204™ 2017, Sustainable Projects Exhibit, dated as indicated below:
(Insert the date of the E204 2017 incorporated into this Agreement.)~~

— « » —

[« »] ~~The Sustainability Plan:~~

Title	Date	Pages

[« »] Supplementary and other Conditions of the Contract:

Document	Title	Date	Pages

- 9 Other documents, if any, listed below:
(List here any additional documents that are intended to form part of the Contract Documents. AIA Document A201™-2017 provides that the advertisement or invitation to bid, Instructions to Bidders, sample forms, the Contractor's bid or proposal, portions of Addenda relating to bidding or proposal requirements, and other information furnished by the Owner in anticipation of receiving bids or proposals, are not part of the Contract Documents unless enumerated in this Agreement. Any such documents should be listed here only if intended to be part of the Contract Documents.)

« »

This Agreement entered into as of the day and year first written above.

OWNER (Signature)

« »« »

(Printed name and title)

CONTRACTOR (Signature)

« »« »

(Printed name and title)

GENERAL TERMS AND CONDITIONS

APPLICABLE TO CONTRACTS BETWEEN THE CHARLOTTESVILLE ALBEMARLE AIRPORT AUTHORITY AND NON-GOVERNMENTAL PARTIES FOR THE PURCHASE OF GOODS AND SERVICES

- 1.) **General Application.** These general terms and conditions apply to all Authority purchases of goods and services, including, without limitation, construction, insurance, and other services. They shall be deemed an integrated part of each contract entered into between the Charlottesville-Albemarle Airport Authority (“Authority”) and a non-governmental party. In the event of a conflict between these general terms and conditions and any other provision of a contract between the Authority and a non-governmental party, the provisions of these general terms and conditions shall govern the parties’ agreement.
- 2.) **Modification of contract pricing.** (VA. Code §2.2-4309). No fixed-price contract may be increased by more than twenty-five percent of the amount of the contract or \$50,000, whichever is greater, without the advance written approval of Authority’s governing body. In no event may the amount of any contract, without adequate consideration, be increased for any purpose, including, but not limited to, relief of a bidder from the consequences of an error in its bid, proposal or price quote.
- 3.) **Energy Forward Pricing Mechanisms.** (VA. Code §2.2-4329.1). For the purpose of budget risk reduction, Authority may use forward pricing mechanisms, consistent with Authority’s written policies and procedures governing the use of forward pricing mechanisms. Any contract for natural gas, heating oil, propane, diesel fuel, unleaded fuel, and any other energy source, but excluding contracts for the purchase of electricity, may include a forward pricing mechanism which either: (i) Obligates Authority to buy or sell a specified quantity of energy at a future date, at a set price or (ii) Includes an option for the sale or purchase of the contract.
Forward pricing mechanism transactions shall be made only under the following conditions:
(i) Authority’s obligations shall be subject to the availability and annual appropriation of funding;
(ii) The quantity of energy affected by the forward pricing mechanism shall not exceed the estimated energy use for Authority for the same period, which shall not exceed 48 months from the trade date of the transaction; and (ii) a separate account shall be established by the contractor for operational energy for the Authority. Contractor shall be required to cooperate and assist Authority with any and all internal and external audit reviews, and with the preparation and submission of annual reports to Authority’s internal investment committee.
- 4.) **Modification (extension) of Contract Term** (VA. Code §2.2-4309). Authority may extend the term of an existing contract for services, to allow completion of any work undertaken but not completed during the original term of the contract. Any such extension of time shall be in writing and signed by an authorized representative of the Authority.
- 5.) **Annual appropriations condition.** For any contracts that cannot or will not be completed within a single fiscal year: notwithstanding anything in this contract to the contrary, beyond the initial fiscal year in which performance is commenced, Authority’s obligations are and shall be subject to and expressly conditioned upon the availability and appropriation of public funds by Authority to support continued performance in succeeding fiscal years. When funds are not appropriated or otherwise made available to support continuation of performance in a succeeding fiscal year,

the order for goods, or contractor's performance of services, as applicable, shall be canceled and the Contractor shall be reimbursed for the reasonable value of any goods ordered and received, and services completed, prior to the end of the preceding fiscal year.

- 6.) **No Discrimination by Authority** (VA. Code §2.2- 4310). In the solicitation or awarding of contracts, Authority shall not discriminate against a bidder or offeror because of race, religion, color, sex, national origin, age, disability, status as a service disabled veteran, or any other basis prohibited by state law relating to discrimination in employment. **THE AUTHORITY DOES NOT DISCRIMINATE AGAINST FAITH-BASED ORGANIZATIONS**, and shall comply with the requirements of VA Code §2.2-4343.1, as may be applicable.
- 7.) **No Discrimination by Contractor** (Contracts Over \$10,000) (VA. Code §2.2-4311). During the performance of a contract where contractor's compensation is more than \$10,000, the contractor agrees as follows:
 - a. The contractor will not discriminate against any employee or applicant for employment because of race, religion, color, sex, national origin, age, disability, or other basis prohibited by state law relating to discrimination in employment, except where there is a bona fide occupational qualification reasonably necessary to the normal operation of the contractor. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the provisions of this nondiscrimination clause.
 - b. The contractor, in all solicitations or advertisements for employees placed by or on behalf of the contractor, will state that such contractor is an equal opportunity employer.
 - c. Notices, advertisements and solicitations placed in accordance with federal law, rule or regulation shall be deemed sufficient for the purpose of meeting the requirements of this section.

The contractor will include the provisions of the foregoing paragraphs a, b and c in every subcontract or purchase order of over \$10,000, so that the provisions will be binding upon each subcontractor or vendor.

- 8.) **Compliance with Federal Immigration Laws** (VA. Code §2.2-4311.1). The contractor expressly warrants and certifies that it does not, and shall not during the performance of the contract knowingly employ an unauthorized alien as defined in the federal Immigration Reform and Control Act of 1986.
- 9.) **Contractor's Authority to Conduct Business in Virginia** (VA. Code §2.2-4311.2). A contractor organized as a stock or non-stock corporation, limited liability company, business trust, or limited partnership or registered as a registered limited liability partnership shall be authorized to transact business in the Commonwealth as a domestic or foreign business entity if so required by Title 13.1 or Title 50 or as otherwise required by law. A contractor that enters into a contract with Authority shall not allow its existence to lapse or its certificate of authority or registration to transact business in the Commonwealth, if so required under Title 13.1 or Title 50, to be revoked or cancelled at any time during the term of the contract. Authority may void any contract with a business entity for its failure to comply and remain in compliance with the provisions of this paragraph.
- 10.) **Drug-Free Workplace Requirement** (Contracts Over \$10,000) (VA. Code §2.2-4312). During the performance of a contract where contractor's compensation is more than \$10,000, the contractor agrees to (i) provide a drug-free workplace for the contractor's employees; (ii) post in conspicuous places, available to employees and applicants for employment, a statement notifying employees that the unlawful manufacture, sale, distribution, dispensation, possession, or use of a controlled

substance or marijuana is prohibited in the contractor's workplace and specifying the actions that will be taken against employees for violations of such prohibition; (iii) state in all solicitations or advertisements for employees placed by or on behalf of the contractor that the contractor maintains a drug-free workplace; and (iv) include the provisions of the foregoing clauses in every subcontract or purchase order of over \$10,000, so that the provisions will be binding upon each subcontractor or vendor. For the purposes of this section, "drug-free workplace" means a site for the performance of work done in connection with a specific contract awarded to a contractor in accordance with this chapter, the employees of whom are prohibited from engaging in the unlawful manufacture, sale, distribution, dispensation, possession or use of any controlled substance or marijuana during the performance of the contract.

- 11.) **Workers' Compensation Coverage** (Construction Contracts) (VA. Code §2.2-4332). No contractor shall perform any work on a Authority construction project unless and until he has obtained, and continues to maintain for the duration of the work, workers' compensation coverage required pursuant to the provisions of Chapter 8 (§ 65.2-800 et seq.) of Title 65.2.
- 12.) **Contractor's License** (Construction Contracts) (VA. Code §54.1-1115). No individual or business entity shall contract for, or bid upon, the construction, removal, repair or improvements to or upon real property owned, controlled or leased by Authority without a state-issued license or certificate, or without the proper class of license as defined in VA. Code § 54.1-1100 for the value of work to be performed.
- 13.) **Purchase of building materials, etc., from architect or engineer prohibited** (VA. Code §2.2-4374). No building materials, supplies or equipment for any building or structure constructed by or for the Authority shall be sold by or purchased from any person employed as an independent contractor by the Authority to furnish architectural or engineering services, but not construction, for such building or structure, or from any partnership, association or corporation in which such architect or engineer has a personal interest. No building materials, supplies or equipment for any building or structure constructed by or for the Authority shall be sold by or purchased from any person who has provided or is currently providing design services specifying a sole source for such materials, supplies or equipment to be used in the building or structure to the independent contractor employed by the Authority to furnish architectural or engineering services in which such person has a personal interest. For purposes of this paragraph, the term "personal interest" shall have the meaning set forth within VA. Code §2.2-3101.
- 14.) **Bonds and alternate forms of security** (VA. Code §§2.2-4337 and -4338). Where any payment or performance bond, with surety, is required, each of the bonds shall be executed by one or more surety companies selected by the contractor that are authorized to do business in Virginia. Each of the bonds shall be filed with Authority.

In lieu of a bid, payment, or performance bond, a bidder may furnish a certified check or cash escrow in the face amount required for the bond. If approved by Authority attorney, a bidder may furnish a personal bond, property bond, or bank or savings institution's letter of credit on certain designated funds in the face amount required for a required bid, payment or performance bond. Approval shall be granted only upon a determination that the alternative form of security proffered affords protection to Authority equivalent to a corporate surety's bond.

- 15.) **Required Insurance.** The specific insurance requirements for this contract, if any, ("Required Insurance") have been specifically set forth within the Specifications/Special Terms and Conditions of the procurement documents. All policies of Required Insurance shall be issued by a company authorized to do business within the Commonwealth of Virginia. (See VA. Code §38.2-518).

Prior to award, the contractor shall be required to demonstrate that it has obtained the Required Insurance, and that each Required Insurance Policy has been endorsed (i) to name Authority, its officers, employees and agents as additional insured parties, and (ii) to confer rights upon Authority to receive at least 30 days' advance notice of cancellation or nonrenewal. Proof of insurance and required endorsements shall be demonstrated through production of copies of the Required Insurance policies and endorsements, or other evidence satisfactory to Authority. If a standard form insurance certificate is utilized, the insurance certificate must contain the Policy ID number(s) as well as the specific Endorsement Number(s), along with a description of the purpose(s) of the referenced endorsements.

- 16.) **Prompt Payment by Authority** (VA. Code §§2.2- 4352, 2.2-4353) Authority shall promptly pay for the completed delivered goods or services by the required payment date. The required payment date shall be either: (i) the date on which payment is due under the terms of the contract for the provision of the goods or services; or (ii) if a date is not established by contract, not more than 45 days after goods or services are received or not more than 45 days after the invoice is rendered, whichever is later. Separate payment dates may be specified for contracts under which goods or services are provided in a series of partial executions or deliveries to the extent that the contract provides for separate payment for partial execution or delivery. Unless otherwise provided under the terms of the contract for the provision of goods or services, if Authority fails to pay by the required payment date then Authority shall pay any finance charges assessed by the supplier that shall not exceed one percent per month. In those cases where payment is made by mail, the date of postmark shall be deemed to be the date payment is made.
- 17.) **Contractor's Tax ID** (VA. Code §2.2-4354(2)). Notwithstanding the foregoing, contractor shall have no right to receive payment from Authority unless and until (i) for an individual contractor, the contractor must provide his social security number to the Authority, and (ii) for proprietorships, partnerships, and corporations, any such entity must provide its federal employer identification number to the Authority.
- 18.) **Notice of defects or impropriety** (VA. Code §2.2-4352). Within 20 days after the receipt of an invoice, or of goods or services, the Authority shall notify the supplier of any defect or impropriety that would prevent payment by the payment date.
- 19.) **Interest**. Unless otherwise provided under the terms of this contract, interest shall accrue at the rate of one percent per month on amounts owed by Authority to contractor which remain unpaid by the required payment date. (See VA Code §2.2-4354)

No interest penalty shall be charged when payment is delayed because of disagreement between Authority and a vendor regarding the quantity, quality or time of delivery of goods or services or the accuracy of any invoice received for the goods or services. The exception from the interest penalty provided by this paragraph shall apply only to that portion of a delayed payment that is actually the subject of the disagreement and shall apply only for the duration of the disagreement.

- 20.) **Retainage (Construction Contracts)** (VA. Code §2.2-4333). In any construction contract that provides for progress payments in installments based upon an estimated percentage of completion, the contractor shall be paid at least 95 percent of the earned sum when payment is due, with no more than 5 percent being retained to ensure faithful performance of the contract. All amounts withheld may be included in the final payment. Any subcontract for a public project that provides for similar progress payments shall be subject to the provisions of this section.
- 21.) **Escrowed Retainage (Construction Contracts)** (VA. Code §2.2-4334). For a construction contract involving \$200,000 or more, for construction of highways, roads, streets, bridges, parking lots,

demolition, clearing, grading, excavating, paving, pile driving, miscellaneous drainage structures, and the installation of water, gas, sewer lines and pumping stations, where portions of the contract price are to be retained, the contractor is authorized to elect to utilize an escrowed retainage procedure, via notification submitted with its bid submission.

In the event the contractor elects to use the escrow account procedure, the contractor shall execute an escrow form, substantially the same as that used by VDOT, and shall submit the executed escrow form to Authority within 15 calendar days after notification. If the escrow agreement is not submitted within the 15-day period, the contractor shall forfeit his rights to the use of the escrow account procedure. Any designated escrow agent shall be a trust company, bank or savings institution with its principal office located in the Commonwealth. If the construction contract includes payment of interest on retained funds, the contractor shall, exclusive of reasonable circumstances beyond the control of the contractor, be required to pay a penalty specified within the construction contract for each day exceeding the completion date stated in the contract.

- 22.) **Payment of subcontractors required** (VA. Code §2.2-4354) Within seven days after receipt of amounts paid to the contractor by Authority for work performed by the subcontractor under that contract the contractor shall: (a) pay the subcontractor for the proportionate share of the total payment received from the agency attributable to the work performed by the subcontractor under that contract; or (b) notify the agency and subcontractor, in writing, of his intention to withhold all or a part of the subcontractor's payment with the reason for nonpayment. Contractor shall pay interest to the subcontractor on all amounts owed by the contractor that remain unpaid after seven days following receipt by the contractor of payment from Authority for work performed by the subcontractor under that contract, except for amounts withheld as allowed in (b), above. Unless otherwise provided under the terms of this contract, interest shall accrue at the rate of one percent per month. Contractor shall include in each of its subcontracts a provision requiring each subcontractor to include or otherwise be subject to the same payment and interest requirements with respect to each lower-tier subcontractor. A contractor's obligation to pay an interest charge to a subcontractor pursuant to this payment clause shall not be construed to be an obligation of Authority. No contract modification shall be made for the purpose of providing reimbursement for the interest charge, and no cost reimbursement claim shall include any amount for reimbursement for the interest charge.
- 23.) **Contract disputes and claims** (VA. Code §2.2- 4363). Written notice of the contractor's intention to file a claim, whether for money or other relief, shall be given at the time of the occurrence or beginning of the work upon which the claim is based. Nothing herein shall preclude a contract from requiring submission of an invoice for final payment within a certain time after completion and acceptance of the work or acceptance of the goods. Pendency of claims shall not delay payment of amounts agreed due in the final payment. Contract claims, whether for money or other relief, shall be submitted in writing to the Authority no later than 60 days after the contractor's receipt of final payment; provided, however, that written notice of the contractor's intention to file a claims shall have been given at the time of the occurrence, or at the beginning of the work, upon which the claim is based. Claims shall be considered by Authority in accordance with VA Code §2.2-4363.

The final decision of Authority shall be final and conclusive unless the contractor appeals within six months of the date of the final decision on the claim by Authority, by instituting legal action as provided in VA Code §2.2-4364.

- 24.) **Trade Secrets; Proprietary Information.** Except as provided in VA Code §2.2-4342, all proceedings, records, contracts and other public records relating to procurement transactions shall be open to the inspection of any citizen, or any interested person, firm or corporation, in accordance with the Virginia Freedom of Information Act (VA Code § 2.2-3700 et seq.). Any inspection of procurement transaction records under this section shall be subject to reasonable restrictions to ensure the security and integrity of the records. Trade secrets or proprietary information submitted by a bidder in connection with a procurement transaction or prequalification application shall not be subject to the Virginia Freedom of Information Act (§ 2.2-3700 et seq.); provided that the bidder must (i) invoke the protections of the referenced VA. Code section prior to or upon submission of the data or other materials, (ii) identify the data or other materials to be protected, and (iii) state the reasons why protection is necessary. Each bidder is solely responsible for protecting its trade secrets or proprietary information in accordance with these instructions.
- 25.) **Applicable Law.** Any contract resulting from a Authority procurement transaction shall be governed in all aspects by the laws of the Commonwealth of Virginia, without regard to conflict of laws' provisions, and any litigation with respect thereto shall be brought in the Circuit Court for Albemarle County, Virginia, or other court presiding within the territory in which Authority is situated.
- 26.) **No Collusion** (VA. Code §18.2-498.4). Any person offering or agreeing to transact business with Authority may be required to submit a certification that the offer or agreement or any claim resulting therefrom is not the result of, or affected by, any act of collusion with another person engaged in the same line of business or commerce; or any act of fraud punishable under this article.
- 27.) **No Waivers of Sovereign or Governmental Immunity.** No action or omission of Authority, and no terms, conditions or provisions within any contract resulting from this procurement transaction, shall be deemed or construed as a waiver of any sovereign or governmental immunity to which Authority may be entitled under the laws of the Commonwealth of Virginia, or any applicable federal law.

SPECIAL PROVISIONS

CHARLOTTESVILLE ALBEMARLE AIRPORT AUTHORITY BOARD CHARLOTTESVILLE ALBEMARLE AIRPORT

SECTION 1

PROJECT INFORMATION

- 1. CONTRACT PROVISIONS.** The General Provisions and these Special Provisions are applicable to all divisions and sections of the Contract Documents and Specifications. It shall be the Contractor's responsibility to so inform all parties who should be bound or influenced thereby.

In the event there are discrepancies between the technical specifications, general provisions, and the special provisions, the interpretation most advantageous to the Owner shall apply.

- 2. DESCRIPTION OF WORK.** The proposed Work is described in the Invitation to Bid herein.
- 3. LOCATION OF THE WORK.** The site of the proposed Work is at the Charlottesville Albemarle Airport.

- 4. DEFINITIONS.**

- A. ADDENDA.** Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the bidding documents or the Contract Documents.
- B. BID.** The offer or proposal of the bidder submitted on the prescribed form setting forth the prices for the Work and services to be performed.
- C. DAY.** Unless otherwise defined shall mean "calendar" day.
- D. DRAWINGS.** The drawings which show the character and scope of the Work to be performed and which have been prepared or approved by the Engineer and are referred to in the Contract Documents.
- E. ENGINEER.** The term "Engineer" in the Contract Documents means RS&H, Inc; 2600 Park Tower Dr. Suite 101, Vienna, Virginia 22180.
- F. FIELD ORDER.** A written order issued by the Engineer which orders minor changes in the work consistent with the intent of the Contract Documents, but which does not involve a change in the Contract Price or the Contract Time.

The Engineer may authorize minor changes in the work not involving an adjustment in the contract price or the contract time, which are consistent with the overall intent of the Contract Documents. These may be accomplished by a field order and shall be binding on the Owner, and also on the Contractor who shall perform the change promptly. If the Contractor believes that a field order justifies an increase in the contract price or contract time, the Contractor shall make a claim under Section 50, Subsection 50-16, Claims for Adjustment and Disputes of the General Provisions before doing the Work.

- G. FURNISH or INSTALL or PROVIDE or SUPPLY.** Unless specifically limited in the context, the word "Furnish" or the word "Install" or the word "Provide" or the word "Supply" or any combination or similar directive or usage thereof, shall mean FURNISHING AND INCORPORATION IN THE WORK including all necessary labor, materials, equipment, and anything necessary to perform the work indicated.
- H. GOOD REPAIR.** Good repair shall be construed to mean any defect, functional or structural deterioration (except that from ordinary and reasonable use) which appreciably reduces the effectiveness or efficiency of the work or improvement for the purpose intended, or any serious departure from the standards of original construction described in the Contract Documents, shall be remedied by the Contractor. Such remedy will be made without further cost to the Owner, including in part, all damages caused by such defect, deficiency, deterioration, or departure, and by its repair, replacement, or correction.
- I. MAY.** Permissive.
- J. REFERENCE TO TRADE OR SUBCONTRACTORS.** When only one principal contract exists for all work covered by the Contract Documents, reference to trade or subcontractors in the Contract Documents shall not create any contractual relationship between the Owner and any trade or subcontractor, with whom the principal contractor may subcontract.
- K. SAMPLES.** Samples are physical examples furnished or constructed by the Contractor to illustrate materials, equipment, workmanship, or finishes, and to establish standards by which the work will be judged.
- L. "SHALL" IMPLIED.** In the interest of conciseness, some sentences, statements, and clauses used in the specifications exclude any form of the verb "shall" normally expressed in a verb phrase with verbs such as "furnish", "install", "provide", "perform", "construct", "erect", "comply", "apply", "submit", or similar "verb", but any such sentences, statements, and clauses shall be interpreted to include the applicable form of the phrase "The Contractor shall" and the requirements described therein shall be interpreted as mandatory elements of the Contract.
- M. SHALL.** Mandatory.
- N. SUBCONTRACTOR.** Party supplying labor and material or any labor for work at the site of the project for, and under separate contract or agreement with the Contractor. Nothing contained in the Contract Documents shall create any contractual relationship between the Owner and any subcontractor.
- O. SUBSTANTIAL COMPLETION.** When the work is sufficiently complete so it may be safely, conveniently, and beneficially utilized by the Owner for all of the purposes for which it was intended.
- P. WILL.** Mandatory.
- Q. SEDIMENT.** Soil and other debris that have eroded and have been transported by runoff water or wind.
- R. SOLID WASTES.** Rubbish, debris, and other discarded solid materials, except hazardous waste as defined in paragraph entitled, "Hazardous Waste," resulting from industrial, commercial, and agricultural operations and from community activities.

- S. RUBBISH.** Combustible and noncombustible wastes including paper, boxes, glass, crockery, metal, lumber, cans, and bones.
- T. DEBRIS.** Combustible and noncombustible wastes such as ashes and waste materials resulting from construction or maintenance and repair work, leaves, and tree trimmings.
- U. CHEMICAL WASTES.** Salts, acids, alkalis, herbicides, pesticides, and organic chemicals.
- V. SEWAGE.** Waste characterized as domestic sanitary sewage.
- W. GARBAGE.** Refuse and scraps resulting from consumption of food.
- X. HAZARDOUS WASTES.** Hazardous substances as defined in 40 CFR 261 or as defined by applicable state and local regulations.
- Y. OILY WASTES.** Petroleum products and bituminous materials.
- Z. HAZARDOUS MATERIALS.** As defined in DOT Regulation 49 CFR 171 and listed in CFR 172.
- AA. HAZARDOUS SUBSTANCES.** As defined in EPA PL 96-510.

- 5. APPLICABLE DRAWINGS.** The drawings applicable to this project are included in the Table of Contents included herein.
- 6. PROPOSAL REQUIREMENTS.** In addition to those herein before described items to be submitted with the Bidder's Proposal, the Bidder shall submit, with his Proposal, a list of all Subcontractors the Bidder proposes to use on the Work of this Contract.

After the Sponsor accepts the Bidder's Proposal and such Bidder is awarded a Contract, the successful Bidder may not substitute a Subcontractor listed in the Proposal without the prior written approval of the Owner. Such approval shall be obtained at least ten Calendar Days prior to the date scheduled for that Subcontractor to begin Work.

- 7. CONTRACTOR'S LIABILITY INSURANCE.** The following provisions supplement the requirements specified in Special Provisions--Section 2.

The Contractor shall purchase and maintain such insurance as will protect him from claims set forth below which may arise out of or result from the Contractor's operations under the Contract, whether such operations be by himself or by any Subcontractor or by anyone directly or indirectly employed by any of them or by any one for whose acts any of them may be liable:

- (1) Claims under workmen's compensation, disability benefit and other similar employee benefits acts;
- (2) Claims for damages because of bodily injury, occupational sickness or disease, or death of his employees;
- (3) Claims for damages because of bodily injury, sickness or disease, or death of any person other than his employees;

- (4) Claims for damages insured by usual personal injury liability coverage which are sustained (1) by any person as a result of an offense directly or indirectly related to the employment of such person by the Contractor, or (2) by any other person; and
- (5) Claims for damages because of injury to or destruction of tangible property, including loss of use resulting therefrom.

General notes regarding liability:

- (a) The Comprehensive General Liability policy shall include explosion, collapse and underground (X-C-U) coverage.
 - (b) The Contractual Liability shall include provisions for covering the indemnity specified under Paragraph 70-11 "Responsibility for Damage Claims" of the General Provisions.
 - (c) Comprehensive Automobile Liability shall include owned, leased, non-owned, and hired vehicles.
 - (d) The Comprehensive General Liability and Automobile Liability insurance shall include Contingent Liability and Contingent Property Damage Insurance to protect the Contractor against claims arising from the operations of Subcontractors, suppliers, vendors, or any person, firm or entity providing service to the Contractor.
 - (e) The Contractor's General Liability insurance shall include coverage to protect the Sponsor, Owner and Engineer from damage resulting either directly or indirectly from acts or omissions of the Contractor to existing buildings near the Work of the Contractor under the Contract, and the contents of such buildings.
 - (f) Certificates of the Contractor's Comprehensive Liability insurance, Comprehensive Automobile Liability insurance and Workmen's Compensation insurance shall be furnished to the Owner prior to commencement of Work. The certificates of insurance shall contain a provision that coverage afforded under the policies will not be canceled until at least 30 days prior written notice has been given to the Owner.
 - (g) Certificates of insurance shall be executed on AIA Document G705.
- 8. ACCESS TO THE WORK.** Access to the Work shall be via the access routes designated on the Contract Layout Plan. The Contractor shall identify access routes with suitable signs, barricades, and similar equipment. Access gates shall be locked and secured when not attended by the Contractor. The entire access route and construction site shall be kept free and clean of all debris at all times and maintained in good repair by the Contractor. All damage to the access route caused by the actions of the Contractor or his agents shall be immediately repaired to the satisfaction of the Owner.

No separate payment will be made for complying with the requirements of this paragraph "Access to the Work." No other access to these Work sites will be permitted without written approval of the Engineer. Contractor's vehicles and equipment, including vehicles and equipment of the Subcontractors and others coming under the Contractor's control, will not be permitted to traverse other airfield areas or pavements without written approval of the Engineer. Contractor's vehicles, equipment and materials may be stored in the area designated on the Plans. Upon completion of the Work, the storage area shall be cleaned up and returned to its original condition to the satisfaction of the Owner. No separate payment will be made for cleanup and restoration of the storage area. Personal

services, such as canteen trucks, will not be permitted beyond this area and drivers of vehicles being operated beyond this area shall be subject to loss of permission to enter the construction site.

9. SHOP DRAWINGS, PRODUCT DATA AND SAMPLES.

- (1) Shop Drawings are drawings, diagrams, schedules and other data specially prepared for the Work by the Contractor or any Subcontractor, manufacturer, supplier or distributor to illustrate some portion of the Work.
- (2) Product data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams or other information furnished by the Contractor to illustrate a material, product or system for some portion of the Work.
- (3) Samples are physical examples which illustrate materials, equipment or workmanship and establish standards by which the Work will be judged.
- (4) The Contractor shall review, approve and submit, with reasonable promptness and in such sequence as to cause no delay in the Work or in the Work of the Owner or any other separate Contractor(s), all Shop Drawings, Product Data and Samples required by the Contract Documents.
- (5) By approving and submitting Shop Drawings, Product Data and Samples, the Contractor represents that he has determined and verified all materials, field measurements and field construction criteria related thereto, or will do so, and that he has checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.
- (6) The Contractor shall not be relieved of responsibility for any deviation from the requirements of the Contract Documents by the Engineer's approval of Shop Drawings, Product Data or Samples unless the Contractor has specifically informed the Engineer in writing of such deviation at the time of submission and the Engineer has given written approval of the specific deviation. The Contractor shall not be relieved of responsibility for errors or omissions in the Shop Drawings, Product Data or Samples by the Engineer's approval thereof.
- (7) The Contractor shall direct specific attention, in writing, or on resubmitted Shop Drawings, Product Data or Samples, to revisions other than those requested by the Engineer on previous submittals.
- (8) No portion of the Work requiring submission of a Shop Drawing, Product Data or Sample shall be commenced until the submittals have been approved by the Engineer. All such portions of the Work shall be in accordance with approved submittals.
- (9) The Contractor shall not reproduce the Engineer's project drawings for Shop Drawing use without written approval of the Engineer.
- (10) The Contractor shall submit shop drawings per the individual technical specifications contained herein. Shop Drawings shall be forwarded to **RS&H, 10748 Deerwood Park Boulevard South, Jacksonville, Florida 32256**, marked to the attention of **Keith M. Nix, P.E.** The Contractor's letter of submittal must conform to the typical Contractor's "Transmittal Letter" which is available from the Engineer. Each drawing or part of the

brochure shall be listed separately on the letter and identified as indicated thereon. Failure to do this will cause rejection of the submittal. The Engineer will return to the Contractor the same transmittal letter, with the Shop Drawing disposition noted thereon along with the drawings or brochures when the review is completed. The Contractor shall forward separate transmittal letters for submitting each group of Shop Drawings common to a Specification Section.

- (11) In checking Shop Drawings prior to submittal, the Contractor is requested to note corrections or comments on the drawings in orange pencil.
- (12) Drawings returned to the Contractor will be stamped "Approved," "Approved as Noted," "Returned for Corrections," or "Not Approved." Drawings stamped "Approved as Noted" need not be returned for further approval if the notations are acceptable to the Contractor and Subcontractors. Drawings stamped "Returned for Corrections" or "Not Approved" shall require new submission. Comments and corrections by the Engineer will be made in red pencil on blue or black line prints and in yellow pencil on white line prints.
- (13) Samples shall be submitted to RS&H, accompanied with the same transmittal letter prescribed for Shop Drawings. Checking by Contractor of samples before transmittal is required the same as for Shop Drawings.

10. PROJECT DOCUMENTATION.

- (a) Project Drawings: A field set of Plans and Specifications, supplied by the Contractor, shall remain on the job site at all times and shall be available at all times to the Engineer.

The Contractor shall immediately include plainly and conspicuously on the field set of drawings, and at appropriate paragraphs in the specifications, all changes or corrections made by addenda and Change Orders as they are issued.

Approved copies of all shop drawings and other submittals are to be kept on the job site at all times and shall be available at all times to the Engineer.

Changes and deviations from the existing conditions shall be submitted in writing for approval prior to installation. In no case shall any unspecified equipment or materials be installed without prior approval by the Engineer.

- (b) Record Documents:

- (1) Definition: Record copies are defined to include those documents or copies relating directly to performance of the Work, which Contractor is required to prepare or maintain for Owner's records, recording the Work as actually performed. In particular, record copies show changes in the Work in relation to way in which shown and specified by original Contract Documents; and show additional information of value to Owner's records, but not indicated by original Contract Documents. Record copies include newly prepared drawings (if any are specified), marked-up copies of Contract drawings, shop drawings, Specifications, addenda and Change Orders, marked-up product data submittals, record samples, field records for variable and concealed conditions such as excavations and foundations, and miscellaneous record information on Work which is otherwise recorded only schematically or not at all.

- (2) Record Drawings: Contractor shall maintain a set of record drawings at the job site. These shall be kept legible and current and shall be available for inspection at all times by the Engineer. The Contractor shall show all changes or Work added on these record drawings in a contrasting color.

11.FINAL CLEANING.

- (a) Provide final cleaning of the Work, at time indicated, consisting of cleaning each surface or unit of Work to normal "clean" condition.
- (b) Removal of Protection: Remove temporary protection devices and facilities which were installed during course of the Work to protect previous completed Work during remainder of construction period.
- (c) Compliances: Comply with safety standards and governing regulations for cleaning operations. Do not burn waste materials at site, or bury debris or excess materials on Owner's property, or discharge volatile or other harmful or dangerous materials into drainage systems; remove waste materials from site and dispose of in a lawful manner.

Where extra materials of value remaining after completion of associated Work have become Owner's property, dispose of these as directed by owner.

END OF SPECIAL PROVISIONS - SECTION 1

SPECIAL PROVISIONS

CHARLOTTESVILLE ALBEMARLE AIRPORT AUTHORITY BOARD CHARLOTTESVILLE ALBEMARLE AIRPORT

SECTION 2

INSURANCE REQUIREMENTS

1. REQUIREMENTS OF CONTRACTOR LIABILITY INSURANCE. The Contractor shall procure and maintain at his own expense, during the life of this Contract, liability insurance with limits of coverage not less than the amounts as hereinafter specified. The policies shall be written by reputable companies authorized to do business in the Commonwealth of Pennsylvania, rated no less than A-9 by A.M. BEST. All such insurance shall be subject to the approval of the Owner for adequacy of protection and shall include a provision preventing cancellation without thirty days prior notice to the Owner in writing. At the time of execution of the Contract, the successful Bidder shall furnish the Owner evidence that appropriate insurance has been procured and will be maintained for the life of the Contract liability and compensation insurance.

The Contractor will provide protection from claims set forth below which may arise out of or result from the Contractor's performance and furnishing of the Work and the Contractor's other obligations under the Contract as follows:

1. Commercial General Liability - \$1,000,000 per loss for bodily injury, personal injury and property damage. If a general aggregate limit is used, either the general aggregate limit shall apply separately to this project/location or the general aggregate limit shall be twice the required occurrence limit.
2. Automobile Liability - \$ 1,000,000 per accident for bodily injury and property damage,
3. Employer's Liability - \$ 1,000,000 per accident for bodily injury or disease.
4. Umbrella Liability - \$ 5,000,000 aggregate limit.
5. Workers' Compensation coverage as required by law.
6. The Contractor will be required to provide a Certificate of Insurance and a copy of the additional insured endorsement, indicating:
 - Commercial General Liability insurance, including contractual liability, and defense costs outside of policy limits. Contractor's policy will be primary and be on an occurrence basis.
 - Automobile Liability insurance
 - Umbrella Liability insurance
 - Workers' Compensation insurance

In carrying out any of the Contract provisions or in exercising any power or authority granted to the Contractor by this Contract, there shall be no liability upon the Engineer, his authorized representatives, or any official 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. THE CHARLOTTESVILLE ALBEMARLE AIRPORT AUTHORITY BOARD, THE CHARLOTTESVILLE ALBEMARLE AIRPORT, AND THE ENGINEER SHALL BE AN ADDITIONAL INSURED AND PROTECTED, IN THE CONTRACTOR'S LIABILITY INSURANCE POLICY, FROM ALL CLAIMS ARISING OUT OF, OR IN CONNECTION WITH, ANY OPERATIONS CONDUCTED IN CONNECTION WITH THIS CONTRACT BY THE CONTRACTOR OR HIS SUBCONTRACTORS.

END OF SPECIAL PROVISIONS - SECTION 2

SPECIAL PROVISIONS

CHARLOTTESVILLE ALBEMARLE AIRPORT AUTHORITY BOARD CHARLOTTESVILLE ALBEMARLE AIRPORT

SECTION 3

MISCELLANEOUS

1. **BID AND CONTRACT ACCEPTANCE.** The Charlottesville Albemarle Airport Authority Board reserves the following rights: to accept or reject any or all bids; and to award the Contract to the most responsive and responsible Bidder whose bid is determined by the Authority to be in its best interest. Any and all proposals as submitted herein are subject to further negotiation at the option of Authority. Further, any and all agreements arising out of these proposals and negotiations shall not be binding or valid against the Authority, its department, officers, employees, or agents unless fully executed in writing and authorized by the Charlottesville Albemarle Airport Authority Board.
2. **PROVISIONS REQUIRED BY LAW DEEMED INSERTED.** Each and every provision of law and clause required by law to be inserted in the Contract Documents shall be deemed to be inserted herein and the Contract shall be read and enforced as though it were included herein. If, for any reason, any such provision is not inserted in the Contract, or is not correctly inserted, then upon application of either party, the Contract shall forthwith be physically amended to make such insertion or correction.
3. **CORRELATION OF DOCUMENTS.**
 - A. The drawings and specifications are cooperative and supplementary. Portions of the work which can be best be illustrated by the drawings may not be included in the specifications and portions best described by the specifications may not be depicted on the drawings. All items necessary or incidental to completely construct or erect the work shall be furnished, whether called for in the specifications or shown on the drawings. Anything mentioned in the specifications and not shown on the drawings, or anything shown or mentioned on the drawings and not mentioned in the specifications, shall be of like effect as if shown or mentioned in both.
 - B. In case of disagreement between the drawings and specifications, or within either document itself, the better quality or greater quantity of work shall be estimated and included in the bid and contract price and the matter drawn to the Engineer's attention for decision.
4. **NOTICE AND SERVICE THEREOF.** Where the manner of giving notice is not otherwise provided for in the Contract Documents, 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 Contractor at the address given in the Contractor's proposal, or at the last business address known to him who gives the notice, or delivered in person to the Contractor or his authorized representative on the site. It is mutually agreed that such notice shall be sufficient and adequate.
5. **SUBCONTRACTING.**
 - A. The Contractor may utilize the services of specialty or minority subcontractors on those parts of the work which, under normal contracting practices, are performed by specialty or minority subcontractors.

- B.** The Owner reserves the right to approve subcontractors for any work. The Contractor, if requested by the Owner, shall submit to the Owner the proposed award and such information as the Owner may require concerning any subcontractor.
- C.** The Contractor shall be as fully responsible to the Owner for the acts and omissions of his subcontractors, and of persons either directly or indirectly employed by them, or under their control, as he is for the acts and omissions of persons directly employed by him.
- D.** The Contractor shall cause appropriate provisions to be inserted in all subcontracts relative to the work to bind subcontractors to the Contractor by the terms of the Contract Documents insofar as applicable to the work of subcontractors, and to give the Contractor the same power as regards terminating any subcontract that the Owner may exercise over the Contractor under any provision of the Contract Documents.
- E.** Nothing contained in the Contract Documents shall create any contractual relationships between any subcontractor and the Owner.

6. PROTECTION OF PERSONS.

A. The Contractor shall:

- (1)** At all times protect the lives and health of his employees under the Contract;
 - (2)** Take all necessary precautions for the safety of all persons on or in the vicinity of the project site.
 - (3)** Comply with all applicable provisions of Federal, State and Municipal safety laws and building codes.
 - (4)** Comply with all pertinent provisions of the Manual of Accident Prevention in Construction issued by the Associated General Contractors of America, Inc., latest edition, to prevent accidents or injury to persons on or about or adjacent to the premises where the work is being performed. He shall erect and properly maintain at all times, as required by the conditions and progress of the work, all necessary safeguards for the protection of persons and shall post danger signs warning against the hazards created in part by features of construction such as protruding nails, rod hoists, well holes, falling materials, etc., and he shall designate a responsible member of his organization on the work site whose duty shall be the prevention of accidents;
 - (5)** Provide for all safeguards for the protection of those having Right-of-Entry during field review and observation of the work.
- B.** The Contractor shall comply with all provisions of the "Williams-Steiger Occupational Safety and Health Act of 1970" including any amendments thereto and rules and regulations issued pursuant thereto, applicable to the Work and performance of the Contract. Where a State in which work is performed has passed legislation bearing on Occupational Safety and Health, such legislation and amendments thereto, together with rules and regulations issued pursuant thereto, shall be complied with by the Contractor.

7. AUTHORITY OF ENGINEER.

- A.** The Engineer, through its duly authorized representatives, shall furnish engineering services during construction of the work to the extent provided in the Contract Documents. He shall observe and review the work in the process of construction or erection. Compliance with the Contract Documents shall be the Contractor's responsibility notwithstanding such observation or review. The Engineer has authority to recommend suspension of the work to the Owner when it appears such suspension may be necessary to accomplish the proper implementation of the intent of the Contract Documents. The authority to observe, review or recommend suspension of the work, or exercise such other authority as may be granted by the Contract Documents, shall not be construed or interpreted to mean supervision of construction, which is the Contractor's responsibility, nor make the Engineer responsible for providing a safe place for the performance of work by the Contractor or by the Contractor's employees, or those of suppliers or subcontractors, or for access, visits, use, work, travel, or occupancy by any other person. The Engineer shall also have the authority to reject any work, materials, or equipment which do not conform to the Contract Documents and to decide technical questions which arise in the execution of the work.
- B.** The Engineer shall determine the amount, quality, acceptability, and fitness of the several kinds of work, materials, equipment and supplies which are to be paid for under the Contract and shall decide questions which may arise in relation to said work and its compliance with the Contract Documents. The Engineer's estimates and decisions shall be final and conclusive, except as otherwise expressly provided in case any question shall arise between the parties to the Contract relative to the Contract Documents, the determination or decision of the Engineer shall be a condition precedent to the right of the Contractor to receive any money or payment for work under the Contract affected in any manner or to any extent by such question.
- C.** The Engineer shall decide the meaning and intent of any portion of the Contract Documents where the same may be found obscure or be in dispute.

8. "GOOD REPAIR" PERIOD.

- A.** The Contractor hereby agrees to keep all work constructed under the Contract in good repair for a minimum period of one (1) year, unless a longer period is otherwise specified in the Contract Documents, from the date of acceptance of all of the work by the Owner. No provision of the Contract documents shall be valid which limits the "Good Repair" period to less than one (1) year from the date of acceptance of all of the work by the Owner. The work may be phased. If the work is phased, each phase of Work completed shall be inspected and approved for use by the Owner but shall not be accepted until all work for all phases is complete and a final inspection for all work has been performed.
- B.** It is intended that this provision shall apply whether or not bond is required, as a personal obligation of the Contractor.
- C.** The obligations of the Contractor as herein provided shall be in addition to and not in limitation of any obligations imposed upon him by special guarantees required by the Contract Documents or otherwise prescribed by law.

- 9. VARIATION FROM ESTIMATED QUANTITIES.** The Contractor may reasonably expect a variation in estimated quantities such that the total payment for the completed work may range from 75 to 125 percent of the total amount of the Contract based on the estimated quantities defined in the

proposal. The Contractor will not be allowed any claims for anticipated profits, for loss of profits, or for any damages because of a difference between the estimate of any item defined in the proposal and the amount of the item actually required or for the elimination of any part of the work. Funds for construction of the work herein contemplated are limited. The Owner reserves the right to eliminate or reduce the items of the proposal or any of the work as may be required to bring the cost of the work within the limits of available funds.

- 10. WATER FOR CONSTRUCTION.** Water used for construction of this project will be furnished by the Contractor. The Contractor shall make the necessary arrangements with the Owner of the source of water for securing and/or transporting such water. No separate payment will be made for water used but the cost thereof shall be included in the various items of the proposal and bid schedule.
- 11. LIGHTS AND POWER.** The Contractor shall provide, at his own expense, temporary lighting and facilities required for the proper prosecution and inspection of the work.
- 12. COORDINATION WITH OTHERS.** In the event other contractors are doing work in the same area simultaneously with this project, the Contractor shall coordinate his proposed construction with that of the other contractors. The Contractor shall notify the Engineer of said coordination attempts and the results.
- 13. PROPERTY LINES AND MONUMENTS.** The Contractor shall protect all property corner markers and any other monument, and when any such markers or monuments are in danger of being disturbed, they shall be properly referenced and if disturbed shall be reset at the expense of the Contractor.
- 14. FENCES AND DRAINAGE CHANNELS.** Boundary fences or other improvements removed to permit the installation of the work shall be replaced in the same location and left in a condition as good or better than that in which they were found. Existing fences not to be removed and intersecting with new fencing (fencing outside airport property) shall be connected to the new fencing in a manner acceptable to the fence owner and the Owner and/or Engineer.

Where surface drainage channels are disturbed or blocked during construction, they shall be restored to their original condition of grade and cross section after the work of construction is completed.
- 15. AIR POLLUTION.** The Contractor shall comply with all Federal, State and Local Requirements.
- 16. EXISTING UTILITIES AND SERVICE LINES.** The Contractor shall be responsible for the protection of all existing utilities or service lines crossed or exposed by his construction operations. Where existing utilities or service lines are cut, broken or damaged, the Contractor shall replace or repair the utilities or service lines with the same type of original material and construction, or better, at his own cost and expense, with the exception of those items included in the bid schedule.
- 17. RECORDS OF MATERIALS PURCHASED.** By a certain time, each month as defined and established at the preconstruction conference, the Contractor shall furnish to the Engineer, duplicate copies of all invoices for materials furnished to be incorporated into the work, plus a statement of all materials previously included on monthly estimates and incorporated into the work during the preceding month. This information is to be used to determine the value of materials on hand to be included in the monthly estimate for periodical payment.
- 18. CONTRACTOR ACCESS TO PROJECT SITE.** The Contractor shall have a specific access route to the project site. This route is shown in the construction drawings. The Contractor shall use this route to bring all equipment and materials in. If the Contractor has a better route that will prevent damage to

existing roads or provide safer access to the construction site, the Contractor shall supply a drawing showing the recommended route to the Owner and Engineer for approval at the preconstruction conference.

19. NIGHTTIME WORK. Work requiring nighttime work and nighttime work procedures are shown in the plans and specifications contained within.

20. DUST CONTROL. The Contractor shall maintain strict dust control per the project plans and specifications contained within.

END OF SPECIAL PROVISIONS - SECTION 3

CHARLOTTESVILLE ALBEMARLE AIRPORT AUTHORITY BOARD
CHARLOTTESVILLE ALBEMARLE AIRPORT
**FEDERAL REQUIRED CONTRACT PROVISIONS FOR NON-AIRPORT IMPROVEMENT
PROGRAM (AIP) CONTRACTS**

A1 CIVIL RIGHTS - GENERAL CIVIL RIGHTS PROVISIONS

GENERAL CIVIL RIGHTS PROVISIONS

The Contractor agrees to comply with pertinent statutes, Executive Orders and such rules as are promulgated to ensure that no person shall, on the grounds of race, creed, color, national origin, sex, age, or disability be excluded from participating in any activity conducted with or benefiting from Federal assistance.

This provision binds the Contractor and subcontractors from the bid solicitation period through the completion of the contract. This provision is in addition to that required by Title VI of the Civil Rights Act of 1964.

A2 CIVIL RIGHTS – TITLE VI SOLICITATION NOTICE

Dollar Threshold: \$0

The Charlottesville-Albemarle Airport Authority, 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 any contract entered into pursuant to this advertisement, disadvantaged business enterprises will be afforded full and fair opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, or national origin in consideration for an award.

COMPLIANCE WITH NONDISCRIMINATION REQUIREMENTS

During the performance of this contract, the Contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the “Contractor”), agrees as follows:

1. **Compliance with Regulations:** The Contractor (hereinafter includes consultants) will comply with the Title VI List of Pertinent Nondiscrimination Acts and Authorities, as they may be amended from time to time, which are herein incorporated by reference and made a part of this contract.
2. **Nondiscrimination:** The Contractor, with regard to the work performed by it during the contract, will not discriminate on the grounds of race, color, or national origin in the selection and retention of subcontractors, including procurements of materials and leases of equipment. The Contractor will not participate directly or indirectly in the discrimination prohibited by the Nondiscrimination Acts and Authorities, including employment practices when the contract covers any activity, project, or program set forth in Appendix B of 49 CFR part 21.
3. **Solicitations for Subcontracts, including Procurements of Materials and Equipment:** In all solicitations, either by competitive bidding or negotiation made by the Contractor for work to be performed under a subcontract, including procurements of materials, or leases of equipment, each potential subcontractor or supplier will be notified by the Contractor of the contractor’s obligations under this contract and the Nondiscrimination Acts and Authorities on the grounds of race, color, or national origin.
4. **Information and Reports:** The Contractor will provide all information and reports required by the Acts, the Regulations, and directives issued pursuant thereto and will permit access to its books,

records, accounts, other sources of information, and its facilities as may be determined by the sponsor or the Federal Aviation Administration to be pertinent to ascertain compliance with such Nondiscrimination Acts and Authorities and instructions. Where any information required of a contractor is in the exclusive possession of another who fails or refuses to furnish the information, the Contractor will so certify to the sponsor or the Federal Aviation Administration, as appropriate, and will set forth what efforts it has made to obtain the information.

5. **Sanctions for Noncompliance:** In the event of a Contractor's noncompliance with the non-discrimination provisions of this contract, the sponsor will impose such contract sanctions as it or the Federal Aviation Administration may determine to be appropriate, including, but not limited to:

- a. Withholding payments to the Contractor under the contract until the Contractor complies; and/or
- b. Cancelling, terminating, or suspending a contract, in whole or in part.

6. **Incorporation of Provisions:** The Contractor will include the provisions of paragraphs one through six in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Acts, the Regulations, and directives issued pursuant thereto. The Contractor will take action with respect to any subcontract or procurement as the sponsor or the Federal Aviation Administration may direct as a means of enforcing such provisions including sanctions for noncompliance. Provided, that if the Contractor becomes involved in, or is threatened with litigation by a subcontractor, or supplier because of such direction, the Contractor may request the sponsor to enter into any litigation to protect the interests of the sponsor. In addition, the Contractor may request the United States to enter into the litigation to protect the interests of the United States.

TITLE VI LIST OF PERTINENT NONDISCRIMINATION ACTS AND AUTHORITIES

During the performance of this contract, the Contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the "Contractor") agrees to comply with the following non-discrimination statutes and authorities; including but not limited to:

- Title VI of the Civil Rights Act of 1964 (42 USC § 2000d *et seq.*, 78 stat. 252) (prohibits discrimination on the basis of race, color, national origin);
- 49 CFR part 21 (Non-discrimination in Federally-assisted programs of the Department of Transportation—Effectuation of Title VI of the Civil Rights Act of 1964);
- The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, (42 USC § 4601) (prohibits unfair treatment of persons displaced or whose property has been acquired because of Federal or Federal-aid programs and projects);
- Section 504 of the Rehabilitation Act of 1973 (29 USC § 794 *et seq.*), as amended (prohibits discrimination on the basis of disability); and 49 CFR part 27;
- The Age Discrimination Act of 1975, as amended (42 USC § 6101 *et seq.*) (prohibits discrimination on the basis of age);
- Airport and Airway Improvement Act of 1982 (49 USC § 471, Section 47123), as amended (prohibits discrimination based on race, creed, color, national origin, or sex);
- The Civil Rights Restoration Act of 1987 (PL 100-209) (broadened the scope, coverage and applicability of Title VI of the Civil Rights Act of 1964, the Age Discrimination Act of 1975 and Section 504 of the Rehabilitation Act of 1973, by expanding the definition of the terms "programs or activities" to include all of the programs or activities of the Federal-aid recipients, sub-recipients and contractors, whether such programs or activities are Federally funded or not);
- Titles II and III of the Americans with Disabilities Act of 1990, which prohibit discrimination on

the basis of disability in the operation of public entities, public and private transportation systems, places of public accommodation, and certain testing entities (42 USC §§ 12131 – 12189) as implemented by U.S. Department of Transportation regulations at 49 CFR parts 37 and 38;

- The Federal Aviation Administration’s Nondiscrimination statute (49 USC § 47123) (prohibits discrimination on the basis of race, color, national origin, and sex);
- Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, which ensures nondiscrimination against minority populations by discouraging programs, policies, and activities with disproportionately high and adverse human health or environmental effects on minority and low-income populations;
- Executive Order 13166, Improving Access to Services for Persons with Limited English Proficiency, and resulting agency guidance, national origin discrimination includes discrimination because of limited English proficiency (LEP). To ensure compliance with Title VI, you must take reasonable steps to ensure that LEP persons have meaningful access to your programs (70 Fed. Reg. at 74087 to 74100);
- Title IX of the Education Amendments of 1972, as amended, which prohibits you from discriminating because of sex in education programs or activities (20 USC 1681 et seq).

A3 FEDERAL FAIR LABOR STANDARDS ACT (FEDERAL MINIMUM WAGE)

SOLICITATION CLAUSE

All contracts and subcontracts that result from this solicitation incorporate by reference the provisions of 29 CFR part 201, the Federal Fair Labor Standards Act (FLSA), with the same force and effect as if given in full text. The FLSA sets minimum wage, overtime pay, recordkeeping, and child labor standards for full and part-time workers.

The [*Contractor*] has full responsibility to monitor compliance to the referenced statute or regulation. The [*Contractor*] must address any claims or disputes that arise from this requirement directly with the U.S. Department of Labor – Wage and Hour Division.

SECTION 011000 - SUMMARY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Project information.
2. Work covered by Contract Documents.
3. Contractor's use of site and premises.
4. Coordination with occupants.
5. Work restrictions.
6. Specification and Drawing conventions.
7. Project Construction Duration

B. Related Requirements:

1. Section 015000 "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.
2. Section 017300 "Execution" for coordination of Owner-installed products.

1.2 DEFINITIONS

- ##### A. Work Package: A group of specifications, drawings, and schedules prepared by the design team to describe a portion of the Project Work for pricing, permitting, and construction.

1.3 PROJECT INFORMATION

A. Project Identification: Baggage Handling Systems Upgrades.

1. Project Location: 100 Bowen Loop, Charlottesville, VA 22911

B. Owner: Charlottesville Albemarle Airport

1. Owner's Representative: Jason DeVillier, Director of Operations, Maintenance and Construction.

C. Architect: RS&H, Inc.

1. Architect's Representative: Keith Nix, keith.nix@rsandh.com.

- D. Web-Based Project Software: Project software will be used for purposes of managing communication and documents during the construction stage.
 - 1. See Section 013100 "Project Management and Coordination." for requirements for using web-based Project software.

1.4 WORK COVERED BY CONTRACT DOCUMENTS

- A. The Work of Project is defined by the Contract Documents and includes, but is not limited to, the following:
 - 1. This project is for the replacement of inbound and outbound baggage handling systems, and other Work indicated in the Contract Documents.
- B. Type of Contract:
 - 1. Project will be constructed under a single prime contract.

1.5 CONTRACTOR'S USE OF SITE AND PREMISES

- A. Restricted Use of Site: Contractor shall have limited use of Project site for construction operations as indicated on Drawings by the Contract limits and as indicated by requirements of this Section.
- B. Limits on Use of Site: Limit use of Project site to Work in areas indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.
 - 1. Limits on Use of Site: Confine construction operations to where shown on drawings.
 - 2. Driveways, Walkways and Entrances: Keep driveways, covered drop off area, parking lot, loading areas, and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or for storage of materials unless indicated on drawings.
 - a. Schedule deliveries to minimize use of driveways and entrances by construction operations.
 - b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.
- C. Condition of Existing Building: Maintain portions of existing building affected by construction operations in a weathertight condition throughout construction period. Repair damage caused by construction operations.

- D. Condition of Existing Grounds: Maintain portions of existing grounds, landscaping, and hardscaping affected by construction operations throughout construction period. Repair damage caused by construction operations.

1.6 COORDINATION WITH OCCUPANTS

- A. Full Owner Occupancy: Owner will occupy Project site and existing building(s) during entire construction period. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's day-to-day operations. Maintain existing exits unless otherwise indicated.
 - 1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and approval of authorities having jurisdiction.
 - 2. Notify Owner not less than **72** hours in advance of activities that will affect Owner's operations.

1.7 WORK RESTRICTIONS

- A. Comply with restrictions on construction operations.
 - 1. Comply with limitations on use of public streets, work on public streets, rights of way, and other requirements of authorities having jurisdiction.
- B. On-Site Work Hours: Confirm work hours with Airport prior to scheduling Work. Non-standard work hours(outside of normal 7:00 AM – 5:00 PM hours) are anticipated to be required for the performance of the work. Contractor shall include costs for any premium shift hours necessary to complete the work.
- C. On-Site Workday Restrictions: Do not perform work resulting in utility shutdowns or resulting in noisy activity on-site.
- D. Existing Utility or HVAC Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging for temporary utility services according to requirements indicated:
 - 1. Notify Owner not less than five days in advance of proposed utility or HVAC interruptions.
 - 2. Obtain Owner's written permission before proceeding with utility or HVAC interruptions.

- E. Noise, Vibration, Dust, and Odors: Coordinate operations that may result in high levels of noise and vibration, dust, odors, or other disruption to Owner occupancy with Owner.
 - 1. Notify Architect and Owner not less than two days in advance of proposed disruptive operations.
 - 2. Obtain Owner's written permission before proceeding with disruptive operations.
- F. Smoking and Controlled Substance Restrictions: Use of tobacco products , alcoholic beverages, and other controlled substances on Owner's property is not permitted; however, smoking is permitted in designated areas.
- G. Employee Identification: Provide identification tags for Contractor personnel working on Project site. Require personnel to use identification tags at all times.
- H. Employee Screening: Comply with Owner's requirements for drug and background screening of Contractor personnel working on Project site.
 - 1. Maintain list of approved screened personnel with Owner's representative.

1.8 SPECIFICATION AND DRAWING CONVENTIONS

- A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
 - 1. Imperative mood and streamlined language are generally used in the Specifications. 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.
 - 2. Text Color: Text used in the Specifications, including units of measure, manufacturer and product names, and other text may appear in multiple colors or underlined as part of a hyperlink; no emphasis is implied by text with these characteristics.
 - 3. Hypertext: Text used in the Specifications may contain hyperlinks. Hyperlinks may allow for access to linked information that is not residing in the Specifications. Unless otherwise indicated, linked information is not part of the Contract Documents.
 - 4. Specification requirements are to be performed by Contractor unless specifically stated otherwise.
- B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.

- C. Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in the Specifications. One or more of the following are used on Drawings to identify materials and products:
1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
 2. Abbreviations: Materials and products are identified by abbreviations scheduled on Drawings and published as part of the U.S. National CAD Standard.
 3. Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Project Manual.

1.9 CONTRACT DURATION

- A. The overall contract duration is 290 calendar days until substantial completion. An additional 30 days after substantial completion is anticipated for project closeout.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 011000

SECTION 01 20 00 – PROJECT MEETINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This section specifies administrative and procedural requirements for project meetings, including, but not limited to, the following:
 - 1. Preconstruction conferences.
 - 2. Preinstallation conferences.
 - 3. Progress meetings.
- B. Contractor's Construction Schedule requirements are specified in another Division 1 section.
- C. Refer to individual sections for the portions of the project requiring preinstallation conferences.

1.3 PRECONSTRUCTION CONFERENCE

- A. The Owner and / or Architect will schedule a preconstruction conference and organizational meeting prior to the start of construction, but no later than fifteen (15) days after the execution of the Owner-Contractor Agreement. The preconstruction conference will be held at the project site, or an otherwise convenient location. The meeting shall be conducted to review responsibilities and personnel assignments.
- B. Attendees: Authorized representatives of the Owner, Architect and their consultants, the Contractor and its superintendent, major subcontractors, manufacturers, suppliers, and other concerned parties shall attend the conference. All participants at the conference shall be familiar with the Project and authorized to conclude matters relating to the work.
- C. Agenda: Discuss items of significance that could affect progress, including the following:
 - 1. Tentative construction schedule.
 - 2. Critical work sequencing.
 - 3. Designation of responsible personnel.

4. Procedures for processing field decisions and Change Orders.
 5. Procedures for processing Applications for Payment.
 6. Distribution of Contract Documents, if not previously distributed.
 7. Submittal of Shop Drawings, Product Data, and Samples.
 8. Preparation of record documents.
 9. Use of the premises.
 10. Parking availability.
 11. Office, work, storage areas and temporary facilities.
 12. Equipment deliveries and priorities.
 13. Safety procedures.
 14. First aid.
 15. Security.
 16. Housekeeping.
 17. Working hours.
 18. Coordination with work of concurrent and subsequent contracts under other Contractors.
 19. Other appropriate topics.
- D. Schedule of Values: The Contractor shall provide an outline or draft copy of the Schedule of Values for initial review. The intent of this submittal is to review the Schedule of Values for organization and content with respect to the construction progress and work requirements, such that the review time of the formal submittal may be minimized. No dollar values or other monetary breakdowns are required with this outline.
- E. The Architect shall record the results of the meeting and distribute copies to attendees and other interested parties.

1.4 PREINSTALLATION CONFERENCES

- A. The Contractor shall conduct a preinstallation conference at the Project Site before each construction activity that requires coordination with other construction.
- B. Attendees: The Installer and representatives of manufacturers and fabricators involved in or affected by the installation, and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise the Architect at least ten (10) working days in advance of scheduled meeting dates.
- C. Do not schedule conferences until the submittals required by the Contract Documents for work associated with the construction activity requiring the conference have been approved and returned to the Contractor.

- D. Review the progress of other construction activities and preparations for the particular activity under consideration at each preinstallation conference, including requirements for the following:
1. Contract Documents.
 2. Options.
 3. Related Change Orders.
 4. Purchases.
 5. Deliveries.
 6. Shop Drawings, Product Data, and quality-control samples.
 7. Review of mockups.
 8. Possible conflicts.
 9. Compatibility problems.
 10. Time schedules.
 11. Weather limitations.
 12. Manufacturer's recommendations.
 13. Warranty requirements.
 14. Compatibility of materials.
 15. Acceptability of substrates.
 16. Temporary facilities.
 17. Space and access limitations.
 18. Governing regulations.
 19. Safety.
 20. Inspecting and testing requirements.
 21. Required performance results.
 22. Recording requirements.
 23. Protection.
- E. The Contractor shall record the results of the meeting and distribute copies to attendees and other interested parties.
- F. Do not proceed with the installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of work and reconvene the conference at the earliest feasible date.

1.5 PROGRESS MEETINGS

- A. The Contractor shall conduct progress meetings at the Project Site at regularly scheduled times on a weekly interval. Notify the Owner and the Architect of scheduled meeting dates. Coordinate dates of meetings with preparation of the payment request and in conjunction with any coordination meetings.
- B. Attendees: In addition to representatives of the Owner and the Architect, each subcontractor, supplier, or other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be

represented at these meetings. All participants at the conference shall be familiar with the Project and authorized to conclude matters relating to progress.

- C. Agenda: Review and correct or approve minutes of the previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to the status of the Project.
1. Contractor's Construction Schedule: Review progress since the last meeting. Determine where each activity is in relation to the Contractor's Construction Schedule, whether on time or ahead or behind schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
 2. Review the present and future needs of each entity present, including the following:
 - a. Interface requirements.
 - b. Time.
 - c. Sequences.
 - d. Status of submittals.
 - e. Deliveries.
 - f. Off-site fabrication problems.
 - g. Access.
 - h. Site utilization.
 - i. Temporary facilities and services.
 - j. Hours of work.
 - k. Hazards and risks.
 - l. Housekeeping.
 - m. Quality and work standards.
 - n. Change Orders.
 - o. Documentation of information for payment requests.
- D. Reporting: Contractor shall record minutes of the meeting and distribute to each party present and to parties who should have been present. Contractor shall revise the construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Contractor shall issue the revised schedule to attendees and others who should have been present no later than 3 days after the meeting.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01 20 00

SECTION 012500 - SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for substitutions.

1.3 DEFINITIONS

- A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents.
 - 1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
 - 2. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required to meet other Project requirements but may offer advantage to Contractor or Owner.

1.4 ACTION SUBMITTALS

- A. Substitution Requests: Submit documentation identifying product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
 - 1. Substitution Request Form: Use form acceptable to Architect.
 - 2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
 - a. Statement indicating why specified product or fabrication or installation method cannot be provided, if applicable.
 - b. Coordination of information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.

- c. Detailed comparison of significant qualities of proposed substitutions with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes, such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
 - d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
 - e. Samples, where applicable or requested.
 - f. Certificates and qualification data, where applicable or requested.
 - g. List of similar installations for completed projects, with project names and addresses as well as names and addresses of architects and owners.
 - h. Material test reports from a qualified testing agency, indicating and interpreting test results for compliance with requirements indicated.
 - i. Detailed comparison of Contractor's construction schedule using proposed substitutions with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
 - j. Cost information, including a proposal of change, if any, in the Contract Sum.
 - k. Contractor's certification that proposed substitution complies with requirements in the Contract Documents, except as indicated in substitution request, is compatible with related materials and is appropriate for applications indicated.
 - l. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within seven days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.
- a. Forms of Acceptance: Change Order, Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work.
 - b. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

1.5 QUALITY ASSURANCE

- A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests recommended by manufacturers.

1.6 PROCEDURES

- A. Coordination: Revise or adjust affected work as necessary to integrate work of the approved substitutions.

1.7 SUBSTITUTIONS

- A. Substitutions for Cause: Submit requests for substitution immediately on discovery of need for change, but not later than 15 days prior to time required for preparation and review of related submittals.

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

- a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
- b. Substitution request is fully documented and properly submitted.
- c. Requested substitution will not adversely affect Contractor's construction schedule.
- d. Requested substitution has received necessary approvals of authorities having jurisdiction.
- e. Requested substitution is compatible with other portions of the Work.
- f. Requested substitution has been coordinated with other portions of the Work.
- g. Requested substitution provides specified warranty.
- h. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

- B. Substitutions for Convenience: Architect will consider requests for substitution if received within 60 days after the Notice to Proceed. Requests received after that time may be considered or rejected at discretion of Architect.

1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied,

Architect will return requests without action, except to record noncompliance with these requirements:

- a. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
- b. Requested substitution does not require extensive revisions to the Contract Documents.
- c. Requested substitution is consistent with the Contract Documents and will produce indicated results.
- d. Substitution request is fully documented and properly submitted.
- e. Requested substitution will not adversely affect Contractor's construction schedule.
- f. Requested substitution has received necessary approvals of authorities having jurisdiction.
- g. Requested substitution is compatible with other portions of the Work.
- h. Requested substitution has been coordinated with other portions of the Work.
- i. Requested substitution provides specified warranty.
- j. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012500

SECTION 012600 - CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for handling and processing Contract modifications.
- B. Related Requirements:
 - 1. Section 012500 "Substitution Procedures" for administrative procedures for handling requests for substitutions made after the Contract award.
 - 2. Section 013100 "Project Management and Coordination" for requirements for forms for contract modifications provided as part of web-based Project management software.

1.3 MINOR CHANGES IN THE WORK

- A. Architect will issue supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on Architect's form.

1.4 PROPOSAL REQUESTS

- A. Owner-Initiated Proposal Requests: Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
 - 1. Work Change Proposal Requests issued by Architect are not instructions either to stop work in progress or to execute the proposed change.
 - 2. Within time specified in Proposal Request or 14 days, when not otherwise specified, after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.

- a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
 - b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 - c. Include costs of labor and supervision directly attributable to the change.
 - d. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
 - e. Quotation Form: Use forms acceptable to Architect.
- B. Contractor-Initiated Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for a change to Architect.
1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
 2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
 3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 4. Include costs of labor and supervision directly attributable to the change.
 5. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
 6. Comply with requirements in Section 012500 "Substitution Procedures" if the proposed change requires substitution of one product or system for product or system specified.
 7. Proposal Request Form: Use form acceptable to Architect.

1.5 CHANGE ORDER PROCEDURES

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

1.6 CONSTRUCTION CHANGE DIRECTIVE

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

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012600

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SECTION 012900 - PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements necessary to prepare and process Applications for Payment.
- B. Related Requirements:
 - 1. Section 012600 "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.
 - 2. Section 013200 "Construction Progress Documentation" for administrative requirements governing the preparation and submittal of the Contractor's construction schedule.

1.3 SCHEDULE OF VALUES

- A. Coordination: Coordinate preparation of the schedule of values with preparation of Contractor's construction schedule.
 - 1. Coordinate line items in the schedule of values with items required to be indicated as separate activities in Contractor's construction schedule.
 - 2. Submit the schedule of values to Architect at earliest possible date, but no later than seven days before the date scheduled for submittal of initial Applications for Payment.
 - 3. Subschedules for Separate Elements of Work: Where the Contractor's construction schedule defines separate elements of the Work, provide subschedules showing values coordinated with each element.
 - 4. Arrange schedule of values consistent with format of AIA Document G703.
 - 5. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Provide multiple line items for principal subcontract amounts in excess of five percent of the Contract Sum.

6. Provide a separate line item in the schedule of values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
 - a. Differentiate between items stored on-site and items stored off-site.
7. Overhead Costs, Proportional Distribution: Include total cost and proportionate share of general overhead and profit for each line item.
8. Schedule of Values Revisions: Revise the schedule of values when Change Orders or Construction Change Directives result in a change in the Contract Sum. Include at least one separate line item for each Change Order and Construction Change Directive.

1.4 APPLICATIONS FOR PAYMENT

- A. Each Application for Payment following the initial Application for Payment shall be consistent with previous applications and payments, as certified by Architect and paid for by Owner.
- B. Payment Application Times: The date for each progress payment is indicated in the Owner/Contractor Agreement. The period of construction work covered by each Application for Payment is the period indicated in the Agreement.
- C. Payment Application Times: If Payment Application Times are not defined as indicated in Paragraph B above, submit Application for Payment to Architect by a certain day of the month that shall be coordinated with the Owner. The period covered by each Application for Payment is one month, ending on the last day of the month.
 1. Submit draft copy of Application for Payment seven days prior to due date for review by Architect.
- D. Application for Payment Forms: Use AIA Document G702 and AIA Document G703 as form for Applications for Payment.
- E. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Architect and / or Owner will return incomplete applications without action.
 1. Entries shall match data on the schedule of values and Contractor's construction schedule. Use updated schedules if revisions were made.
 2. Include amounts for work completed following previous Application for Payment, whether or not payment has been received. Include only amounts for work completed at time of Application for Payment.

3. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
 4. Indicate separate amounts for work being carried out under Owner-requested project acceleration.
- F. Stored Materials: Include in Application for Payment amounts applied for materials or equipment purchased or fabricated and stored, but not yet installed. Differentiate between items stored on-site and items stored off-site.
1. Provide certificate of insurance, evidence of transfer of title to Owner, and consent of surety to payment for stored materials.
 2. Provide supporting documentation that verifies amount requested, such as paid invoices. Match amount requested with amounts indicated on documentation; do not include overhead and profit on stored materials.
 3. Provide summary documentation for stored materials indicating the following:
 - a. Value of materials previously stored and remaining stored as of date of previous Applications for Payment.
 - b. Value of previously stored materials put in place after date of previous Application for Payment and on or before date of current Application for Payment.
 - c. Value of materials stored since date of previous Application for Payment and remaining stored as of date of current Application for Payment.
- G. Transmittal: Submit three signed and notarized original copies of each Application for Payment to Architect and/ or Owner by a method ensuring receipt within 24 hours. One copy shall include waivers of lien and similar attachments if required.
1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.
- H. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's lien from entities lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by the payment.
1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
 2. When an application shows completion of an item, submit conditional final or full waivers.
 3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
 4. Submit final Application for Payment with or preceded by conditional final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.

- I. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
 1. List of subcontractors.
 2. Schedule of values.
 3. Contractor's construction schedule (preliminary if not final).
 4. Products list (preliminary if not final).
 5. Schedule of unit prices.
 6. Submittal schedule (preliminary if not final).
 7. List of Contractor's staff assignments.
 8. List of Contractor's principal consultants.
 9. Copies of building permits.
 10. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
 11. Initial progress report.
 12. Report of preconstruction conference.
 13. Certificates of insurance and insurance policies.
 14. Performance and payment bonds.
 15. Data needed to acquire Owner's insurance.

- J. Application for Payment at Substantial Completion: After Architect issues the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.
 1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
 - a. Complete administrative actions, submittals, and Work preceding this application, as described in Section 017700 "Closeout Procedures."
 2. This application shall reflect Certificate(s) of Substantial Completion issued previously for Owner occupancy of designated portions of the Work.

- K. Final Payment Application: After completing Project closeout requirements, submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited to, the following:
 1. Evidence of completion of Project closeout requirements.
 2. Certification of completion of final punch list items.
 3. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
 4. Updated final statement, accounting for final changes to the Contract Sum.
 5. AIA Document G706.
 6. AIA Document G706A.

7. Evidence that claims have been settled.
8. Final liquidated damages settlement statement.
9. Proof that taxes, fees, and similar obligations are paid.
10. Waivers and releases.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012900

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SECTION 013100 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative provisions for coordinating construction operations on Project, including, but not limited to, the following:
 - 1. General coordination procedures.
 - 2. Coordination drawings.
 - 3. RFIs.
 - 4. Digital project management procedures.
 - 5. Web-based Project management software package.
 - 6. Project meetings.
- B. Each contractor shall participate in coordination requirements. Certain areas of responsibility are assigned to a specific contractor.
- C. Related Requirements:
 - 1. Section 017300 "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
 - 2. Section 017700 "Closeout Procedures" for coordinating closeout of the Contract.

1.2 DEFINITIONS

- A. BIM: Building Information Modeling.
- B. RFI: Request for Information. Request from Owner, Architect, or Contractor seeking information required by or clarifications of the Contract Documents.

1.3 INFORMATIONAL SUBMITTALS

- A. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:
 - 1. Name, address, telephone number, and email address of entity performing subcontract or supplying products.
 - 2. Number and title of related Specification Section(s) covered by subcontract.

3. Drawing number and detail references, as appropriate, covered by subcontract.
- B. Key Personnel Names: Within 15 days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities, list addresses, cellular telephone numbers, and e-mail addresses. Provide names, addresses, and telephone numbers of individuals assigned as alternates in the absence of individuals assigned to Project.

1.4 GENERAL COORDINATION PROCEDURES

- A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations included in different Sections that depend on each other for proper installation, connection, and operation.
1. Schedule construction operations in sequence required to obtain the best results, where installation of one part of the Work depends on installation of other components, before or after its own installation.
 2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
 3. Make adequate provisions to accommodate items scheduled for later installation.
- B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.
- C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
1. Preparation of Contractor's construction schedule.
 2. Preparation of the schedule of values.
 3. Installation and removal of temporary facilities and controls.
 4. Delivery and processing of submittals.
 5. Progress meetings.
 6. Preinstallation conferences.
 7. Project closeout activities.
 8. Startup and adjustment of systems.

1.5 REQUEST FOR INFORMATION (RFI)

- A. General: Immediately on discovery of the need for additional information, clarification, or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.
1. Architect will return without response those RFIs submitted to Architect by other entities controlled by Contractor.
 2. Coordinate and submit RFIs in a prompt manner to avoid delays in Contractor's work or work of subcontractors.
- B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:
1. Project name.
 2. Owner name.
 3. Owner's Project number.
 4. Name of Architect.
 5. Architect's Project number.
 6. Date.
 7. Name of Contractor.
 8. RFI number, numbered sequentially.
 9. RFI subject.
 10. Specification Section number and title and related paragraphs, as appropriate.
 11. Drawing number and detail references, as appropriate.
 12. Field dimensions and conditions, as appropriate.
 13. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
 14. Contractor's signature.
 15. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.
 - a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.
- C. RFI Forms: Form template provided.
1. Attachments shall be electronic files in PDF format.
- D. Architect's Action: Architect will review each RFI, determine action required, and respond. Allow two days for Architect's response for each RFI. RFIs received by Architect after 1:00 p.m. will be considered as received the following working day.
1. The following Contractor-generated RFIs will be returned without action:

- a. Requests for approval of submittals.
 - b. Requests for approval of substitutions.
 - c. Requests for approval of Contractor's means and methods.
 - d. Requests for coordination information already indicated in the Contract Documents.
 - e. Requests for adjustments in the Contract Time or the Contract Sum.
 - f. Requests for interpretation of Architect's actions on submittals.
 - g. Incomplete RFIs or inaccurately prepared RFIs.
2. Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt by Architect of additional information.
 3. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Section 012600 "Contract Modification Procedures."
 - a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect in writing within 5 days of receipt of the RFI response.
- E. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log each progress meeting. Include the following:
1. Project name.
 2. Name and address of Contractor.
 3. Name and address of Architect.
 4. RFI number, including RFIs that were returned without action or withdrawn.
 5. RFI description.
 6. Date the RFI was submitted.
 7. Date Architect's response was received.
 8. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.
 9. Identification of related Field Order, Work Change Directive, and Proposal Request, as appropriate.
- F. On receipt of Architect's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect within five days if Contractor disagrees with response.

1.6 DIGITAL PROJECT MANAGEMENT PROCEDURES

- A. Architect's Data Files Not Available: Architect will not provide Architect's digital data files for Contractor's use during construction.

- B. Web-Based Project Management Software Package: Use Architect's web-based Project management software package (Newforma) for purposes of hosting and managing Project communication and documentation until Final Completion.
- C. PDF Document Preparation: Where PDFs are required to be submitted to Architect, prepare as follows:
 - 1. Assemble complete submittal package into a single indexed file, incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.
 - 2. Name file with submittal number or other unique identifier, including revision identifier.
 - 3. Certifications: Where digitally submitted certificates and certifications are required, provide a digital signature with digital certificate on where indicated.

1.7 PROJECT MEETINGS

- A. General: Schedule and conduct meetings and conferences at Project site unless otherwise indicated.
 - 1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times a minimum of 10 working days prior to meeting.
 - 2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
 - 3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Architect, within three days of the meeting.
- B. Preconstruction Conference: Schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than 15 days after execution of the Agreement.
 - 1. Attendees: Authorized representatives of Owner, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
 - 2. Agenda: Discuss items of significance that could affect progress, including the following:
 - a. Responsibilities and personnel assignments.
 - b. Tentative construction schedule.

- c. Phasing.
- d. Critical work sequencing and long lead items.
- e. Designation of key personnel and their duties.
- f. Lines of communications.
- g. Use of web-based Project software.
- h. Procedures for processing field decisions and Change Orders.
- i. Procedures for RFIs.
- j. Procedures for testing and inspecting.
- k. Procedures for processing Applications for Payment.
- l. Distribution of the Contract Documents.
- m. Submittal procedures.
- n. Preparation of Record Documents.
- o. Use of the premises and existing building.
- p. Work restrictions.
- q. Working hours.
- r. Owner's occupancy requirements.
- s. Responsibility for temporary facilities and controls.
- t. Procedures for moisture and mold control.
- u. Procedures for disruptions and shutdowns.
- v. Construction waste management and recycling.
- w. Parking availability.
- x. Office, work, and storage areas.
- y. Equipment deliveries and priorities.
- z. First aid.
- aa. Security.
- bb. Progress cleaning.

3. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.

C. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity when required by other Sections and when required for coordination with other construction.

- 1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect of scheduled meeting dates.
- 2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
 - a. Contract Documents.
 - b. Options.
 - c. Related RFIs.
 - d. Related Change Orders.

- e. Purchases.
 - f. Deliveries.
 - g. Submittals.
 - h. Review of mockups.
 - i. Possible conflicts.
 - j. Compatibility requirements.
 - k. Time schedules.
 - l. Weather limitations.
 - m. Manufacturer's written instructions.
 - n. Warranty requirements.
 - o. Compatibility of materials.
 - p. Acceptability of substrates.
 - q. Temporary facilities and controls.
 - r. Space and access limitations.
 - s. Regulations of authorities having jurisdiction.
 - t. Testing and inspecting requirements.
 - u. Installation procedures.
 - v. Coordination with other work.
 - w. Required performance results.
 - x. Protection of adjacent work.
 - y. Protection of construction and personnel.
- 3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
 - 4. Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.
 - 5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.
- D. Project Closeout Conference: Schedule and conduct a project closeout conference, at a time convenient to Owner and Architect, but no later than 30 days prior to the scheduled date of Substantial Completion.
- 1. Conduct the conference to review requirements and responsibilities related to Project closeout.
 - 2. Attendees: Authorized representatives of Owner, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the meeting. Participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
 - 3. Agenda: Discuss items of significance that could affect or delay Project closeout, including the following:
 - a. Preparation of Record Documents.

- b. Procedures required prior to inspection for Substantial Completion and for final inspection for acceptance.
 - c. Procedures for completing and archiving web-based Project software site data files.
 - d. Submittal of written warranties.
 - e. Requirements for completing sustainable design documentation.
 - f. Requirements for preparing operations and maintenance data.
 - g. Requirements for delivery of material samples, attic stock, and spare parts.
 - h. Requirements for demonstration and training.
 - i. Preparation of Contractor's punch list.
 - j. Procedures for processing Applications for Payment at Substantial Completion and for final payment.
 - k. Submittal procedures.
 - l. Coordination of separate contracts.
 - m. Owner's partial occupancy requirements.
 - n. Installation of Owner's furniture, fixtures, and equipment.
 - o. Responsibility for removing temporary facilities and controls.
4. Minutes: Entity conducting meeting will record and distribute meeting minutes.
- E. Progress Meetings: Conduct progress meetings at weekly intervals.
- 1. Coordinate dates of meetings with preparation of payment requests.
 - 2. Attendees: In addition to representatives of Owner and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
 - 3. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
 - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
 - 1) Review schedule for next period.
 - b. Review present and future needs of each entity present, including the following:

- 1) Interface requirements.
 - 2) Sequence of operations.
 - 3) Status of submittals.
 - 4) Status of sustainable design documentation.
 - 5) Deliveries.
 - 6) Off-site fabrication.
 - 7) Access.
 - 8) Site use.
 - 9) Temporary facilities and controls.
 - 10) Progress cleaning.
 - 11) Quality and work standards.
 - 12) Status of correction of deficient items.
 - 13) Field observations.
 - 14) Status of RFIs.
 - 15) Status of Proposal Requests.
 - 16) Pending changes.
 - 17) Status of Change Orders.
 - 18) Pending claims and disputes.
 - 19) Documentation of information for payment requests.
4. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.
- a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting, where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013100

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SECTION 013200 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
 - 1. Startup construction schedule.
 - 2. Contractor's Construction Schedule.
 - 3. Construction schedule updating reports.
 - 4. Daily construction reports.
 - 5. Material location reports.
 - 6. Site condition reports.
 - 7. Unusual event reports.
- B. Related Requirements:
 - 1. Section 014000 "Quality Requirements" for schedule of tests and inspections.
 - 2. Section 012900 "Payment Procedures" for schedule of values and requirements for use of cost-loaded schedule for Applications for Payment.

1.3 DEFINITIONS

- A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction Project. Activities included in a construction schedule consume time and resources.
 - 1. Critical Activity: An activity on the critical path that must start and finish on the planned early start and finish times.
 - 2. Predecessor Activity: An activity that precedes another activity in the network.
 - 3. Successor Activity: An activity that follows another activity in the network.
- B. Cost Loading: The allocation of the schedule of values for completing an activity as scheduled. The sum of costs for all activities must equal the total Contract Sum.

- C. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine the critical path of Project and when activities can be performed.
- D. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.
- E. Event: The starting or ending point of an activity.
- F. Float: The measure of leeway in starting and completing an activity.
 - 1. Float time is not for the exclusive use or benefit of either Owner or Contractor, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Contract completion date.
 - 2. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the successor activity.
 - 3. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.
- G. Resource Loading: The allocation of manpower and equipment necessary for completing an activity as scheduled.

1.4 INFORMATIONAL SUBMITTALS

- A. Format for Submittals: Submit required submittals in the following format:
 - 1. Working electronic copy of schedule file.
 - 2. PDF file.
- B. Contractor's Construction Schedule: Initial schedule, of size required to display entire schedule for entire construction period.
- C. CPM Reports: Concurrent with CPM schedule, submit each of the following reports. Format for each activity in reports shall contain activity number, activity description, cost and resource loading, original duration, remaining duration, early start date, early finish date, late start date, late finish date, and total float in calendar days.
 - 1. Activity Report: List of activities sorted by activity number and then early start date, or actual start date if known.
 - 2. Logic Report: List of preceding and succeeding activities for each activity, sorted in ascending order by activity number and then by early start date, or actual start date if known.
 - 3. Total Float Report: List of activities sorted in ascending order of total float.

4. Earnings Report: Compilation of Contractor's total earnings from commencement of the Work until most recent Application for Payment.
- D. Construction Schedule Updating Reports: Submit with Applications for Payment.
- E. Daily Construction Reports: Submit at weekly intervals.
- F. Material Location Reports: Submit at monthly intervals.
- G. Site Condition Reports: Submit at time of discovery of differing conditions.
- H. Unusual Event Reports: Submit at time of unusual event.

1.5 COORDINATION

- A. Coordinate Contractor's Construction Schedule with the schedule of values, submittal schedule, progress reports, payment requests, and other required schedules and reports.
 1. Secure time commitments for performing critical elements of the Work from entities involved.
 2. Coordinate each construction activity in the network with other activities, and schedule them in proper sequence.

1.6 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Computer Scheduling Software: Prepare schedules using current version of a program that has been developed specifically to manage construction schedules.
- B. Time Frame: Extend schedule from date established for the Notice to Proceed to date of Final Completion.
 1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.
- C. Activities: Treat each floor or separate area as a separate numbered activity for each main element of the Work. Comply with the following:
 1. Activity Duration: Define activities so no activity is longer than 30 days, unless specifically allowed by Architect.
 2. Temporary Facilities: Indicate start and completion dates for the following as applicable:

- a. Securing of approvals and permits required for performance of the Work.
 - b. Temporary facilities.
 - c. Construction of mock-ups, prototypes and samples.
 - d. Owner interfaces and furnishing of items.
 - e. Interfaces with Separate Contracts.
 - f. Regulatory agency approvals.
 - g. Punch list.
- 3. Procurement Activities: Include procurement process activities for long lead-time items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
 - 4. Submittal Review Time: Include review and resubmittal times indicated in Section 013300 "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's Construction Schedule with submittal schedule.
 - 5. Startup and Testing Time: Include no fewer than 15 days for startup and testing.
 - 6. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Architect's administrative procedures necessary for certification of Substantial Completion.
 - 7. Punch List and Final Completion: Include not more than 30 days for completion of punch list items and Final Completion.
- D. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.
- 1. Phasing: Arrange list of activities on schedule by phase.
 - 2. Work Restrictions: Show the effect of the following items on the schedule:
 - a. Coordination with existing construction.
 - b. Limitations of continued occupancies.
 - c. Uninterruptible services.
 - d. Partial occupancy before Substantial Completion.
 - e. Use-of-premises restrictions.
 - f. Provisions for future construction.
 - g. Seasonal variations.
 - h. Environmental control.
 - 3. Work Stages: Indicate important stages of construction for each major portion of the Work, including, but not limited to, the following:
 - a. Subcontract awards.
 - b. Submittals.
 - c. Purchases.
 - d. Fabrication.
 - e. Deliveries.

- f. Installation.
 - g. Tests and inspections.
 - h. Adjusting.
 - i. Startup and placement into final use and operation.

- E. Upcoming Work Summary: Prepare summary report indicating activities scheduled to occur or commence prior to submittal of next schedule update. Summarize the following issues:
 - 1. Unresolved issues.
 - 2. Unanswered Requests for Information.
 - 3. Rejected or unreturned submittals.
 - 4. Notations on returned submittals.
 - 5. Pending modifications affecting the Work and the Contract Time.

- F. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule 3 days before each regularly scheduled progress meeting.
 - 1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
 - 2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
 - 3. As the Work progresses, indicate Final Completion percentage for each activity.

- G. Recovery Schedule: When periodic update indicates the Work is 14 or more calendar days behind the current approved schedule, submit a separate recovery schedule indicating means by which Contractor intends to regain compliance with the schedule. Indicate changes to working hours, working days, crew sizes, equipment required to achieve compliance, and date by which recovery will be accomplished.

- H. Distribution: Distribute copies of approved schedule to Architect, Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.
 - 1. Post copies in Project meeting rooms and temporary field offices.
 - 2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

1.7 CPM SCHEDULE REQUIREMENTS

- A. Prepare network diagrams using AON (activity-on-node) format.
- B. Startup Network Diagram: Submit diagram within 14 days of date established for the Notice to Proceed. Outline significant construction activities for the first 90 days of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.
 - 1. Develop network diagram in sufficient time to submit CPM schedule, so it can be accepted for use no later than 30 days after date established for the Notice to Proceed
 - a. Failure to include any work item required for performance of this Contract shall not excuse Contractor from completing all work within applicable completion dates.
 - 2. Use "one workday" as the unit of time for individual activities. Indicate nonworking days and holidays incorporated into the schedule to coordinate with the Contract Time.
- C. CPM Schedule Preparation: Prepare a list of all activities required to complete the Work. Using the startup network diagram, prepare a skeleton network to identify probable critical paths.
 - 1. Activities: Indicate the estimated time duration, sequence requirements, and relationship of each activity in relation to other activities. Include estimated time frames for the following activities:
 - a. Preparation and processing of submittals.
 - b. Mobilization and demobilization.
 - c. Purchase of materials.
 - d. Delivery.
 - e. Fabrication.
 - f. Utility interruptions.
 - g. Installation.
 - h. Testing and inspection.
 - i. Punch list and Final Completion.
 - j. Activities occurring following Final Completion.
 - 2. Critical Path Activities: Identify critical path activities, including those for interim completion dates. Scheduled start and completion dates shall be consistent with Contract milestone dates.
 - 3. Processing: Process data to produce output data on a computer-drawn, time-scaled network. Revise data, reorganize activity sequences, and reproduce as often as necessary to produce the CPM schedule within the limitations of the Contract Time.

4. Format: Mark the critical path. Locate the critical path near center of network; locate paths with most float near the edges.
 - a. Subnetworks on separate sheets are permissible for activities clearly off the critical path.
- D. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis using a network fragment to demonstrate the effect of the proposed change on the overall Project schedule.
- E. Initial Issue of Schedule: Prepare initial network diagram from a sorted activity list indicating straight "early start-total float." Identify critical activities. Prepare tabulated reports showing the following:
 1. Contractor or subcontractor and the Work or activity.
 2. Description of activity.
 3. Main events of activity.
 4. Immediate preceding and succeeding activities.
 5. Early and late start dates.
 6. Early and late finish dates.
 7. Activity duration in workdays.
 8. Total float or slack time.
 9. Average size of workforce.
 10. Dollar value of activity (coordinated with the schedule of values).
- F. Schedule Updating: Concurrent with making revisions to schedule, prepare tabulated reports showing the following:
 1. Identification of activities that have changed.
 2. Changes in early and late start dates.
 3. Changes in early and late finish dates.
 4. Changes in activity durations in workdays.
 5. Changes in the critical path.
 6. Changes in total float or slack time.
 7. Changes in the Contract Time.

1.8 REPORTS

- A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:
 1. List of subcontractors at Project site.
 2. List of separate contractors at Project site.
 3. Approximate count of personnel at Project site.
 4. Equipment at Project site.

5. Material deliveries.
6. High and low temperatures and general weather conditions, including presence of rain or snow.
7. Testing and inspection.
8. Accidents.
9. Meetings and significant decisions.
10. Unusual events.
11. Stoppages, delays, shortages, and losses.
12. Meter readings and similar recordings.
13. Emergency procedures.
14. Orders and requests of authorities having jurisdiction.
15. Change Orders received and implemented.
16. Construction Change Directives received and implemented.
17. Services connected and disconnected.
18. Equipment or system tests and startups.
19. Partial completions and occupancies.
20. Substantial Completions authorized.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013200

SECTION 013300 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:

- 1. Submittal schedule requirements.
- 2. Administrative and procedural requirements for submittals.

- B. Related Requirements:

- 1. Section 013100 "Project Management and Coordination" for submitting coordination drawings and subcontract list and for requirements for web-based Project software.
- 2. Section 017700 "Closeout Procedures" for submitting closeout submittals and maintenance material submittals.
- 3. Section 017839 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.

1.3 DEFINITIONS

- A. Action Submittals: Written and graphic information and physical samples that require Architect's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."
- B. Informational Submittals: Written and graphic information and physical samples that do not require Architect's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."

1.4 SUBMITTAL SCHEDULE

- A. Submittal Schedule: Submit, as an action submittal, a list of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates.

Include additional time required for making corrections or revisions to submittals noted by Architect and additional time for handling and reviewing submittals required by those corrections.

1. Coordinate submittal schedule with list of subcontracts, the schedule of values, and Contractor's construction schedule.
2. Initial Submittal Schedule: Submit concurrently with startup construction schedule. Include submittals required during the first 60 days of construction. List those submittals required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
3. Final Submittal Schedule: Submit concurrently with the first complete submittal of Contractor's construction schedule.
 - a. Submit revised submittal schedule as required to reflect changes in current status and timing for submittals.
4. Format: Arrange the following information in a tabular format:
 - a. Scheduled date for first submittal.
 - b. Specification Section number and title.
 - c. Submittal Category: Action; informational.
 - d. Name of subcontractor.
 - e. Description of the Work covered.
 - f. Scheduled date for Architect's final release or approval.
 - g. Scheduled dates for purchasing.
 - h. Scheduled date of fabrication.
 - i. Scheduled dates for installation.
 - j. Activity or event number.

1.5 SUBMITTAL FORMATS

A. Submittal Information: Include the following information in each submittal:

1. Project name.
2. Date.
3. Name of Architect.
4. Name of Construction Manager.
5. Name of Contractor.
6. Name of firm or entity that prepared submittal.
7. Names of subcontractor, manufacturer, and supplier.
8. Unique submittal number, including revision identifier. Include Specification Section number with sequential alphanumeric identifier and alphanumeric suffix for resubmittals.
9. Category and type of submittal.

10. Submittal purpose and description.
11. Number and title of Specification Section, with paragraph number and generic name for each of multiple items.
12. Drawing number and detail references, as appropriate.
13. Indication of full or partial submittal.
14. Location(s) where product is to be installed, as appropriate.
15. Other necessary identification.
16. Remarks.
17. Signature of transmitter.

B. Options: Identify options requiring selection by Architect.

C. Deviations and Additional Information: On each submittal, clearly indicate deviations from requirements in the Contract Documents, including minor variations and limitations; include relevant additional information and revisions, other than those requested by Architect on previous submittals. Indicate by highlighting on each submittal or noting on attached separate sheet.

D. Electronic Submittals: Prepare submittals as PDF package, incorporating complete information into each PDF file. Name PDF file with submittal number.

E. Submittals Utilizing Web-Based Project Software: Prepare submittals as PDF files or other format indicated by Project management software.

1.6 SUBMITTAL PROCEDURES

A. Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.

1. Web-Based Project Management Software: Prepare submittals in PDF form, and upload to web-based Project management software website. Enter required data in web-based software site to fully identify submittal.

B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.

4. Coordinate transmittal of submittals for related parts of the Work specified in different Sections, so processing will not be delayed because of need to review submittals concurrently for coordination.
 - a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
 1. Initial Review: Allow 14 calendar days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
 2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
 3. Resubmittal Review: Allow 14 calendar days for review of each resubmittal.
 4. Sequential Review: Where sequential review of submittals by Architect's consultants, Owner, or other parties is indicated, allow 21 calendar days for initial review of each submittal.
 5. Concurrent Consultant Review: Where the Contract Documents indicate that submittals may be transmitted simultaneously to Architect and to Architect's consultants, allow 15 days for review of each submittal. Submittal will be returned to Architect before being returned to Contractor.
 - a. Submit one copy of submittal to concurrent reviewer in addition to specified number of copies to Architect.
- D. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
 1. Note date and content of previous submittal.
 2. Note date and content of revision in label or title block, and clearly indicate extent of revision.
 3. Resubmit submittals until they are marked with approval notation from Architect's action stamp.
- E. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

- F. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Architect's action stamp.

1.7 SUBMITTAL REQUIREMENTS

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

1. If information must be specially prepared for submittal because standard published data are unsuitable for use, submit as Shop Drawings, not as Product Data.
2. Mark each copy of each submittal to show which products and options are applicable.
3. Include the following information, as applicable:
 - a. Manufacturer's catalog cuts.
 - b. Manufacturer's product specifications.
 - c. Standard color charts.
 - d. Statement of compliance with specified referenced standards.
 - e. Testing by recognized testing agency.
 - f. Application of testing agency labels and seals.
 - g. Notation of coordination requirements.
 - h. Availability and delivery time information.
4. For equipment, include the following in addition to the above, as applicable:
 - a. Wiring diagrams that show factory-installed wiring.
 - b. Printed performance curves.
 - c. Operational range diagrams.
 - d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.
5. Submit Product Data before Shop Drawings, and before or concurrently with Samples.

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

1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
 - a. Identification of products.
 - b. Schedules.

- c. Compliance with specified standards.
 - d. Notation of coordination requirements.
 - e. Notation of dimensions established by field measurement.
 - f. Relationship and attachment to adjoining construction clearly indicated.
 - g. Seal and signature of professional engineer if specified.
 2. Paper Sheet Size: Except for templates, patterns, and similar full-size Drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches (215 by 280 mm), but no larger than 30 by 42 inches (750 by 1067 mm).
 - a. Two opaque (bond) copies of each submittal. Architect will return one copy.
 - b. Three opaque copies of each submittal. Architect will retain two copies; remainder will be returned.
- C. Samples: Submit Samples for review of type, color, pattern, and texture for a check of these characteristics with other materials.
 1. Transmit Samples that contain multiple, related components, such as accessories together in one submittal package.
 2. Identification: Permanently attach label on unexposed side of Samples that includes the following:
 - a. Project name and submittal number.
 - b. Generic description of Sample.
 - c. Product name and name of manufacturer.
 - d. Sample source.
 - e. Number and title of applicable Specification Section.
 - f. Specification paragraph number and generic name of each item.
 3. Web-Based Project Management Software: Prepare submittals in PDF form, and upload to web-based Project software website. Enter required data in web-based software site to fully identify submittal.
 4. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
 - a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
 - b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.

5. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units, showing the full range of colors, textures, and patterns available.
 - a. Number of Samples: Submit one full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return submittal with options selected.
6. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
 - a. Number of Samples: Submit three sets of Samples. Architect will retain two Sample sets; remainder will be returned.
 - 1) Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
 - 2) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.
- D. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:
 1. Type of product. Include unique identifier for each product indicated in the Contract Documents or assigned by Contractor if none is indicated.
 2. Manufacturer and product name, and model number if applicable.
 3. Number and name of room or space.
 4. Location within room or space.
- E. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.

- F. Design Data: Prepare and submit written and graphic information indicating compliance with indicated performance and design criteria in individual Specification Sections. Include list of assumptions and summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Number each page of submittal.
- G. Certificates:
1. Certificates and Certifications Submittals: Submit a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity. Provide a notarized signature where indicated.
 2. Installer Certificates: Submit written statements on manufacturer's letterhead, certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
 3. Manufacturer Certificates: Submit written statements on manufacturer's letterhead, certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
 4. Material Certificates: Submit written statements on manufacturer's letterhead, certifying that material complies with requirements in the Contract Documents.
 5. Product Certificates: Submit written statements on manufacturer's letterhead, certifying that product complies with requirements in the Contract Documents.
 6. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of AWS B2.1/B2.1M on AWS forms. Include names of firms and personnel certified.
- H. Test and Research Reports:
1. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for substrate preparation and primers required.
 2. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
 3. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
 4. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.

5. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
6. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:
 - a. Name of evaluation organization.
 - b. Date of evaluation.
 - c. Time period when report is in effect.
 - d. Product and manufacturers' names.
 - e. Description of product.
 - f. Test procedures and results.
 - g. Limitations of use.

1.8 DELEGATED-DESIGN SERVICES

- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
 1. If criteria indicated are insufficient to perform services or certification required, submit a written request for additional information to Architect.
- B. Delegated-Design Services Certification: In addition to Shop Drawings, Product Data, and other required submittals, submit digitally signed PDF file and three paper copies of certificate, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.
 1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

1.9 CONTRACTOR'S REVIEW

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

- B. Contractor's Approval: Indicate Contractor's approval for each submittal with a uniform approval stamp. Include name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.
 - 1. Architect will not review submittals received from Contractor that do not have Contractor's review and approval.

1.10 ARCHITECT'S REVIEW

- A. Action Submittals: Architect will review each submittal, indicate corrections or revisions required, and return.
 - 1. PDF Submittals: Architect will indicate, via markup on each submittal, the appropriate action.
 - 2. Submittals by Web-Based Project Management Software: Architect will indicate, on Project management software website, the appropriate action.
- B. Informational Submittals: Architect will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.
- C. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Architect.
- D. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.
- E. Architect will return without review submittals received from sources other than Contractor.
- F. Submittals not required by the Contract Documents will be returned by Architect without action.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013300

SECTION 01 35 00 – MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements for handling and processing contract supplements and modifications.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Division 1, Section 012900 – PAYMENT PROCEDURES for administrative procedures governing Applications for Payment.
 - 2. Division 1, Section 013300 - SUBMITTALS for requirements for the Contractor's Construction Schedule.
 - 3. Division 1, Section 016000 - PRODUCTS AND SUBSTITUTIONS for administrative procedures for handling requests for substitutions made after award of the Contract.
- C. The Architect / Engineer will be reimbursed for an unreasonable number of RFI's and CCA's.

1.3 CONTRACT DOCUMENT SUPPLEMENTS

- A. Clarification / Supplemental Instructions (C): Shall provide further detail to requirements inferred in the Contract Documents or authorize minor changes in the work, not involving an adjustment to the Contract Sum or Contract Time, and will be issued by the Architect with supplemental or revised drawings and specifications, if necessary. Clarifications / Supplemental Instructions issued by the Architect-Engineer shall become binding and a part of the Contract as minor changes in the work unless the Contractor notifies the Architect-Engineer within twenty-one (21) days that the instructions result in changes that affect the Contract Cost or Contract Time.
- B. Request for Information / Supplemental Instructions (RFI): Shall be initiated by the Contractor when necessary for performance of the work. The Architect's reply will constitute further detail to requirements if inferred in the Contract Documents or interpretations of the requirements. Requests for information must describe all

document references that pertain to the issue and any conflicts and must include the contractor's interpretation or proposed action that would be made if there was not a process to obtain the information from the Architect. Requests for information that do not include this, or that request information already included in the contract documents without conflict, will be returned without action (RWA). The Architect will record the time expended to process such requests and notify the Contractor of the charges. The owner shall deduct any such compensation due the Architect from the Contractor's monthly periodic pay requests in accordance with the compensation terms for cost, overhead and profit in the Owner / Architect agreement.

- C. Contractor Corrective Action Proposals (CCA): Shall be initiated by the Contractor when deviation from the contract requirements has been constructed. The Contractor shall provide a fully detailed proposal for his corrective or remedial work. The Architect's reply will indicate approval of the proposed action as detailed, approval with certain modifications, or rejection of the proposal. Use forms provided by the Architect. The Contractor shall maintain a sequentially numbered log of all such proposals. Upon notification of a deviation and request for a CCA the Contractor shall submit one promptly. Should this not occur in a timely fashion which, in the judgment of the Architect, will allow time for processing and correction ahead of other advancing elements of work, the Architect will initiate a CCA giving direction for correction. If the Architect initiates the CCA or must provide significant direction to a Contractor initiated CCA, due to a lack of a fully detailed proposal, the Architect will record the time expended and notify the Contractor of the charges. The owner shall deduct any such compensation due the Architect from the Contractor's monthly periodic pay requests in accordance with the compensation terms for cost, overhead and profit in the Owner / Architect agreement.

1.4 PROPOSAL / CHANGE ORDER REQUESTS

- A. Request for Proposal (RFP): The Architect will issue a detailed description of proposed changes in the Work that will require adjustment to the Contract Sum or Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
 - 1. Proposal requests issued by the Architect are for information only. Do not consider them as an instruction either to stop work in progress or to execute the proposed change.
 - 2. Unless otherwise indicated in the proposal request, within twenty (20) days of receipt of a proposal request, submit an estimate of cost necessary to execute the change to the Architect for the Owner's review.
 - a. Include a list of quantities of products to be purchased and unit costs, along with the total amount of purchases to be made. Where requested, furnish survey data to substantiate quantities.
 - b. Itemize labor charges by time and category.

- c. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 - d. Indicate overhead and profit charges.
 - e. Include a statement indicating the effect the proposed change in the work will have on the Contract Time.
- B. Contractor-Initiated Change Order Requests (RCO): When latent or unforeseen conditions require modifications to the Contract, the Contractor may propose changes by submitting a request for a change to the Architect.
1. Include a statement outlining the reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and Contract Time.
 2. Include a list of quantities of products to be purchased and unit costs along with the total amount of purchases to be made. Where requested, furnish survey data to substantiate quantities.
 3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 4. Comply with requirements in Section 01 60 00 – PRODUCT REQUIREMENTS and Section 01 25 00-SUBSTITUTION PROCEDURES if the proposed change requires substitution of one product or system for a product or system specified.
 5. Change Order Request Form: Use forms provided by the Architect. The Contractor shall maintain a sequential log of all Requests for Change Orders.

1.5 ALLOWANCES

- A. Allowance Adjustment: For allowance-cost adjustment, base each Change Order Proposal on the difference between the actual purchase amount and the allowance, multiplied by the final measurement of work-in-place. Where applicable, include reasonable allowances for cutting losses, tolerances, mixing wastes, normal product imperfections, and similar margins.
1. Include installation costs in the purchase amount only where indicated as part of the allowance.
 2. When requested, prepare explanations and documentation to substantiate the margins claimed.
 3. The Owner reserves the right to establish the actual quantity of work-in-place by independent quantity survey, measure, or count.
- B. Submit claims for increased costs because of a change in scope or nature of the allowance described in the Contract Documents, whether for the purchase order amount or the Contractor's handling, labor, installation, overhead, and profit. Submit claims within twenty (20) days of receipt of the Change Order or Construction Change Directive authorizing work to proceed. The Owner will reject claims submitted later than 20 days.

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

1.6 CONSTRUCTION CHANGE DIRECTIVE

- A. Construction Change Directive: When the Owner and the Contractor are not in total agreement on the terms of a Change Order Proposal Request, the Architect may issue a Construction Change Directive. The Construction Change Directive instructs the Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
 1. The Construction Change Directive will contain a complete description of the change in the work and designate the method to be followed to determine change in the Contract Sum or Contract Time.
- B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.
 1. After completion of the change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

1.7 CHANGE ORDER PROCEDURES

- A. Upon the Owner's approval of a Change Order Proposal Request, the Architect will issue a Change Order for signatures of the Owner and the Contractor on AIA Form G701, or similar, as provided in the Conditions of the Contract. Submit claims within twenty (20) days of receipt of the Change Order or Construction Change Directive authorizing work to proceed. The Owner will reject claims submitted later than twenty (20) days.

1.8 CHANGE ORDER MARK-UP

- A. The amount of overhead and profit allowed to the Contractor on a contract modification will be as follows:
 1. Unit Price - If there is a proposed increase or decrease in a scope item that has a Unit Price in the Contract Documents, no additional mark-up will be allowed for overhead, profit, safety, insurance or bonds. In addition, no reduction in overhead and profit will be taken for the scope change.
 2. Proposal Basis (Additive) – If there is a proposed increase in the scope of work, the Contractor will be allowed a 10% mark-up for overhead and profit for all direct work (work by his/her own forces) and for subcontractors' costs. This mark-up includes overhead, profit, safety and insurance costs. The

Contractor will be paid for the increase in Bond amount equal to his / her actual bonding rate as stated in the bid form. This is to be added for all scope / cost changes.

3. Proposal Basis (Deductive) – If there is a proposed decrease in the scope of work, the Contractor will be required to provide a 0% mark-down for overhead and profit for all direct work (work by his / her own forces) and subcontractors' costs. This mark-down includes overhead, profit, safety and insurance costs. The Contractor will provide a deduction for the decrease in Bond amount equal to his / her actual bonding rate as stated in the bid form. This is to be deducted for all scope / cost changes.
 4. Time & Material (Additive) - If there is a proposed increase in the scope of work due to time and material work directed by the Owner, the Contractor will be allowed a 10% mark-up for overhead and profit for all direct work (work by his/her own forces) and subcontractors' costs. This mark-up includes overhead, profit, safety and insurance costs. The Contractor will be paid for the increase in Bond amount equal to his / her actual bonding rate as stated in the bid form. This is to be added for all scope / cost changes.
- B. All Subcontractors will be required to adhere to the same allowable mark-ups / downs as the Contractor. The Contractor is responsible for reviewing and confirming that all Subcontractors have adhered to the allowable mark-ups / downs as stated above.
- C. The Contractor will be required to provide detailed back-up for all costs associated with the scope change. This includes, but is not limited to material invoices from suppliers, hourly wage rate sheets including all fringe benefits, certified payrolls and bonding amount certification from his / her bonding company.
- D. Equipment – The Contractor will be paid for all equipment (other than small hand tools) as currently defined by the Illinois Department of Transportation "Schedule of Average Annual Equipment Ownership Expense with Operation Cost." No additional mark-up for overhead and profit will be allowed over and above the costs listed in this book. If equipment is not listed in this book, the Contractor is to provide rental agreement / invoices for the equipment.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 35 00

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SECTION 01 35 53 SECURITY PROCEDURES

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED

- A. Establish and maintain Project Security Program to:
 - 1. Protect Work, Stored Products, and Construction Equipment against Theft and Vandalism.
 - 2. Protect Premises against entry by Unauthorized Persons.
- B. Protect Owner's operations at Site against Theft, Vandalism, interference or Damage by Contractor's work or employees.

1.2 MAINTENANCE OF SECURITY

- A. Initiate Security Program promptly after job mobilization.
- B. Maintain Security Program throughout construction period, until Owner-occupancy or Owner-acceptance precludes the need for Contractor-security.

1.3 GENERAL AIRPORT SECURITY REQUIREMENTS

- A. Comply with Airport Security Requirements stipulated below and any other governing requirements of Transportation Security Administration(TSA).
- B. Contractor shall maintain security against unlawful access to "secure areas" of Airport Terminal Building and Airfield Area.
- C. Compliance with specified requirements will not relieve Contractor of responsibility for maintaining proper security, nor shall Contractor construe specified requirements as limiting Contractor's obligation to undertake reasonable action to establish and maintain secure conditions at Project Site.
- D. If Contractor, Subcontractor, or their Workers should breach security requirements, Contractor will be held responsible for Fines and Costs resulting from breach.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 CONTRACTOR BADGING

- A. The Contractor is responsible for Owner-issued security badging as follows:
1. The Contractor is responsible for obtaining photo-identification security badges issued by the Owner for each superintendent of each work crew working within the AOA and terminal. The Contractor must obtain Owner-issued security badges for at least one (1) member of each work crew working in separate areas of the AOA and terminal. All Contractor personnel must either obtain and display an Owner-issued security badge or be escorted and under the responsibility of an individual displaying a current Owner-issued security badge. Badges issued for construction will be good for the duration of the project.
 2. The Contractor is responsible for completing the required Owner-issued security badge application forms, and for submitting the forms to the Owner for their review as early in the project as possible to avoid construction delays. Forms must be submitted at least two (2) weeks in advance of issuance of a badge. Forms will be made available by the Owner after award of the project. The Contractor must designate an authorized signature holder (ASH) responsible for all Contractor badge applications. The ASH designee must complete training to become the authorized ASH, after which all Owner-issued security badge applications must be reviewed and approved via signature by the ASH.
 3. The Contractor may obtain Owner-issued security badges from the operations department at the Airport. The Owner reserves the right to limit the number of security badges issued to the Contractor. The Owner will charge the Contractor a non-refundable fee for each Owner-issued security badge issued. An additional non-refundable fee will be charged for lost or destroyed badges.
 4. Owner-issued security badges must be worn in an easily visible location on the person issued the badge at all times while working within the AOA and terminal. The badge holder must be familiar with and must obey all security and safety rules and regulations. Owner-issued security badges may be confiscated, and all security rights revoked by the Owner upon the breach of any security or safety regulations at the discretion of the Owner. The holder of an Owner-issued security badge must surrender the badge at the completion of this project, upon transfer or termination of employment, or at any other time at the request of the Owner.
 5. Badge holders may only use Owner-issued security badges for access to the AOA and terminal when actively working on this specific project.
 6. Any expired or altered badge, or any badge bearing a photograph not matching the

bearer, must be brought to the attention of the Owner, and will be immediately confiscated by the Owner or the airport police.

7. At the completion of this project, the Contractor must return all Owner-issued security badges to the Owner. All Owner-issued security badges must be accounted for and surrendered at the completion of this project. Failure to account for and surrender all Owner-issued security badges will constitute grounds for withholding retainage from the final pay estimate amount.

3.2 EXECUTION INTERIOR BARRICADING, MARKING, AND LIGHTING

- A. Proper barricading, marking, and lighting of interior construction areas are the responsibility of the Contractor. This will include closing off interior construction areas from public access and properly marking and lighting these areas. Life Safety paths of egress must be continually illuminated and kept clear of all construction materials.

3.3 CONSTRUCTION CONTROL

- A. A primary and alternate responsible Contractor's representative must be designated by the Contractor. The Contractor's representatives must be available locally on a 24-hour basis. Names of the primary and alternate, including phone number, must be made available to the A/E and the Owner by the Contractor. The Contractor must insure that the names and phone numbers are kept current and made available to the A/E and the Owner.

3.4 CONSTRUCTION TECHNIQUES

- A. Construction must be planned and conducted throughout this project in such a manner as to maintain safe airport operations. Every effort must be made to reduce the impact of construction activity on overall airport operations. To this end, the Contractor's activities must be conducted in such a manner to preclude, except where absolutely required, open excavations, trenches, ditches, and above ground obstacles such as booms on cranes. The primary responsibility for assuring that safe construction techniques are followed rests with the contractor.

END OF SECTION 013553

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SECTION 014000 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

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

1.2 DEFINITIONS

- A. Experienced: When used with an entity or individual, "experienced," unless otherwise further described, means having successfully completed a minimum of five previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.
- B. Field Quality-Control Tests and Inspections: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- C. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, subcontractor, or sub-subcontractor, to perform a particular construction operation, including installation, erection, application, assembly, and similar operations.
 - 1. Use of trade-specific terminology in referring to a Work result does not require that certain construction activities specified apply exclusively to specific trade(s).

- D. Preconstruction Testing: Tests and inspections performed specifically for Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria. Unless otherwise indicated, copies of reports of tests or inspections performed for other than the Project do not meet this definition.
- E. Product Tests: Tests and inspections that are performed by a nationally recognized testing laboratory (NRTL) according to 29 CFR 1910.7, by a testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program (NVLAP), or by a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.
- F. Source Quality-Control Tests and Inspections: Tests and inspections that are performed at the source (e.g., plant, mill, factory, or shop).
- G. Testing Agency: An entity engaged to perform specific tests, inspections, or both. The term "testing laboratory" shall have the same meaning as the term "testing agency."
- H. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work, to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
- I. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work, to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Contractor's quality-control services do not include contract administration activities performed by Architect.

1.3 DELEGATED-DESIGN SERVICES

- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
 - 1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.
- B. Delegated-Design Services Statement: Submit a statement signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional, indicating that the products and systems are in compliance with performance and design criteria indicated. Include list of codes, loads, and other factors used in performing these services.

1.4 CONFLICTING REQUIREMENTS

- A. Conflicting Standards and Other Requirements: If compliance with two or more standards or requirements is specified and the standards or requirements establish different or conflicting requirements for minimum quantities or quality levels, inform the Architect regarding the conflict and obtain clarification prior to proceeding with the Work. Refer conflicting requirements that are different, but apparently equal, to Architect for clarification before proceeding.
- B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

1.5 INFORMATIONAL SUBMITTALS

- A. Contractor's Quality-Control Plan: For quality-assurance and quality-control activities and responsibilities.
- B. Qualification Data: For Contractor's quality-control personnel.
- C. Testing Agency Qualifications: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.
- D. Schedule of Tests and Inspections: Prepare in tabular form and include the following:
 - 1. Specification Section number and title.
 - 2. Entity responsible for performing tests and inspections.
 - 3. Description of test and inspection.
 - 4. Identification of applicable standards.
 - 5. Identification of test and inspection methods.
 - 6. Number of tests and inspections required.
 - 7. Time schedule or time span for tests and inspections.
 - 8. Requirements for obtaining samples.
 - 9. Unique characteristics of each quality-control service.
- E. Reports: Prepare and submit certified written reports and documents as specified.
- F. Permits, Licenses, and Certificates: For Owner's record, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents

established for compliance with standards and regulations bearing on performance of the Work.

1.6 CONTRACTOR'S QUALITY-CONTROL PLAN

- A. Quality-Control Plan, General: Submit quality-control plan within 7 days of Notice to Proceed, and not less than five days prior to preconstruction conference. Submit in format acceptable to Architect. Identify personnel, procedures, controls, instructions, tests, records, and forms to be used to carry out Contractor's quality-assurance and quality-control responsibilities and to coordinate Owner's quality-assurance and quality-control activities. Coordinate with Contractor's Construction Schedule.
- B. Quality-Control Personnel Qualifications: Engage qualified personnel trained and experienced in managing and executing quality-assurance and quality-control procedures similar in nature and extent to those required for Project.
 - 1. Project quality-control manager may also serve as Project superintendent.
- C. Submittal Procedure: Describe procedures for ensuring compliance with requirements through review and management of submittal process. Indicate qualifications of personnel responsible for submittal review.
- D. Testing and Inspection: In quality-control plan, include a comprehensive schedule of Work requiring testing or inspection, including the following:
 - 1. Contractor-performed tests and inspections, including subcontractor-performed tests and inspections. Include required tests and inspections and Contractor-elected tests and inspections. Distinguish source quality-control tests and inspections from field quality-control tests and inspections.
 - 2. Special inspections required by authorities having jurisdiction and indicated on the Statement of Special Inspections.
 - 3. Owner-performed tests and inspections indicated in the Contract Documents.
- E. Continuous Inspection of Workmanship: Describe process for continuous inspection during construction to identify and correct deficiencies in workmanship in addition to testing and inspection specified. Indicate types of corrective actions to be required to bring the Work into compliance with standards of workmanship established by Contract requirements and approved mockups.
- F. Monitoring and Documentation: Maintain testing and inspection reports, including log of approved and rejected results. Include Work Architect has indicated as nonconforming or defective. Indicate corrective actions taken to bring nonconforming Work into compliance with requirements. Comply with requirements of authorities having jurisdiction.

1.7 REPORTS AND DOCUMENTS

- A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:
1. Date of issue.
 2. Project title and number.
 3. Name, address, telephone number, and email address of testing agency.
 4. Dates and locations of samples and tests or inspections.
 5. Names of individuals making tests and inspections.
 6. Description of the Work and test and inspection method.
 7. Identification of product and Specification Section.
 8. Complete test or inspection data.
 9. Test and inspection results and an interpretation of test results.
 10. Record of temperature and weather conditions at time of sample-taking and testing and inspection.
 11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
 12. Name and signature of laboratory inspector.
 13. Recommendations on retesting and reinspecting.
- B. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:
1. Name, address, telephone number, and email address of technical representative making report.
 2. Statement on condition of substrates and their acceptability for installation of product.
 3. Statement that products at Project site comply with requirements.
 4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
 5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
 6. Statement of whether conditions, products, and installation will affect warranty.
 7. Other required items indicated in individual Specification Sections.
- C. Factory-Authorized Service Representative's Reports: Prepare written information documenting manufacturer's factory-authorized service representative's tests and inspections specified in other Sections. Include the following:
1. Name, address, telephone number, and email address of factory-authorized service representative making report.
 2. Statement that equipment complies with requirements.

3. Results of operational and other tests and a statement of whether observed performance complies with requirements.
4. Statement of whether conditions, products, and installation will affect warranty.
5. Other required items indicated in individual Specification Sections.

1.8 QUALITY ASSURANCE

- A. Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
- B. **Manufacturer Qualifications:** A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units. As applicable, procure products from manufacturers able to meet qualification requirements, warranty requirements, and technical or factory-authorized service representative requirements.
- C. **Fabricator Qualifications:** A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- D. **Installer Qualifications:** A firm or individual experienced in installing, erecting, applying, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
- E. **Professional Engineer Qualifications:** A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that is similar in material, design, and extent to those indicated for this Project.
- F. **Specialists:** Certain Specification Sections require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged in the activities indicated.
 1. Requirements of authorities having jurisdiction shall supersede requirements for specialists.
- G. **Testing and Inspecting Agency Qualifications:** An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspection indicated, as documented in accordance with ASTM E329, and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.

- H. Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- I. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect, demonstrate, repair, and perform service on installations of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

1.9 QUALITY CONTROL

- A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.
 - 1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspection they are engaged to perform.
 - 2. Costs for Owner retesting and reinspecting construction that replaces or is necessitated by Work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.
- B. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities, whether specified or not, to verify and document that the Work complies with requirements.
 - 1. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
 - 2. Engage a qualified testing agency to perform quality-control services.
 - a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.
 - 3. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspection will be performed.
 - 4. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
 - 5. Testing and inspection requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
 - 6. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

- C. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.
- D. Testing Agency Responsibilities: Cooperate with Architect and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
1. Notify Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
 2. Determine the locations from which test samples will be taken and in which in-situ tests are conducted.
 3. Conduct and interpret tests and inspections, and state in each report whether tested and inspected Work complies with or deviates from requirements.
 4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
 5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
 6. Do not perform duties of Contractor.
- E. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Section 013300 "Submittal Procedures."
- F. Manufacturer's Technical Services: Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in preinstallation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.
- G. Contractor's Associated Requirements and Services: Cooperate with agencies and representatives performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
1. Access to the Work.
 2. Incidental labor and facilities necessary to facilitate tests and inspections.
 3. Adequate quantities of representative samples of materials that require testing and inspection. Assist agency in obtaining samples.
 4. Facilities for storage and field curing of test samples.
 5. Delivery of samples to testing agencies.
 6. Preliminary design mix proposed for use for material mixes that require control by testing agency.

7. Security and protection for samples and for testing and inspection equipment at Project site.
- H. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and quality-control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspection.
 1. Schedule times for tests, inspections, obtaining samples, and similar activities.
- I. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents as a component of Contractor's quality-control plan. Coordinate and submit concurrently with Contractor's Construction Schedule. Update and submit with each Application for Payment.
 1. Schedule Contents: Include tests, inspections, and quality-control services, including Contractor- and Owner-retained services, commissioning activities, and other Project-required services paid for by other entities.
 2. Distribution: Distribute schedule to Owner, Architect, testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

- A. Test and Inspection Log: Prepare a record of tests and inspections. Include the following:
 1. Date test or inspection was conducted.
 2. Description of the Work tested or inspected.
 3. Date test or inspection results were transmitted to Architect.
 4. Identification of testing agency or special inspector conducting test or inspection.
- B. Maintain log at Project site. Post changes and revisions as they occur. Provide access to test and inspection log for Architect's, and authorities' having jurisdiction reference during normal working hours.
 1. Submit log at Project closeout as part of Project Record Documents.

3.2 REPAIR AND PROTECTION

- A. General: On completion of testing, inspection, sample-taking, and similar services, repair damaged construction and restore substrates and finishes.
 - 1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Section 017300 "Execution."
- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 014000

SECTION 014005 - COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This section includes administrative and supervisory requirements necessary for coordinating construction operations including, but not necessarily limited to, the following:
 - 1. General project coordination procedures.
 - 2. Coordination Drawings.
 - 3. Administrative and supervisory personnel.
 - 4. Cleaning and protection.
- B. Related Sections: Refer to other Division 1 sections for coordination requirements regarding field engineering services, project meetings, Contractor's construction schedule, general installation and contract closeout.

1.3 COORDINATION

- A. Coordinate construction operations included in various sections of these Specifications to assure efficient and orderly installation of each part of the work. Coordinate construction operations included under different sections that are dependent upon each other for proper installation, connection, and operation.
 - 1. Schedule construction operations in the sequence required to obtain the best results where installation of one part of the work depends on installation of other components, before or after its own installation.
 - 2. Coordinate installation of different components to assure maximum accessibility for required maintenance, service, and repair.
 - 3. Make provisions to accommodate items scheduled for later installation.
- B. Where necessary, prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and attendance at meetings.
 - 1. Prepare similar memoranda for the Owner and separate contractors where coordination of their work is required.

- C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and assure orderly progress of the work. Such administrative activities include, but are not limited to, the following:
1. Preparation of schedules.
 2. Installation and removal of temporary facilities.
 3. Delivery and processing of submittals.
 4. Progress meetings.
 5. Project closeout activities.

1.4 SUBMITTALS

- A. Coordination Drawings: Prepare coordination drawings as careful coordination is needed for installation of products and materials fabricated by separate entities. Prepare coordination drawings where limited space availability necessitates maximum utilization of space for efficient installation of different components.
1. Show the relationship of components shown on separate Shop Drawings.
 2. Indicate required installation sequences.
 3. Comply with requirements contained in Section 01 33 00 – SUBMITTAL PROCEDURES.
 4. Refer to Division 34 for additional requirements.
- B. Staff Names: Within 15 days of commencement of construction operations, submit a list of the Contractor's principal staff assignments, including the superintendent and other personnel in attendance at the Project Site. Identify individuals and their duties and responsibilities. List their addresses and telephone numbers.
1. Post copies of the list in the Project meeting room, the temporary field office, and each temporary telephone.
- C. Subcontractor / Supplier Names: Within 15 days of commencement of construction operations, submit a listing of Contractor's principal subcontractors and suppliers, naming persons and listing their addresses and phone numbers.

1.5 SITE USE PLAN

- A. Within ten (10) working days of Contract award, the Contractor shall develop and submit for Owner's approval a site use plan. This plan shall clearly describe the proposed temporary facilities, staging areas, ramps and major traffic ways, hazardous material storage, provisions for site services, safety and security. Changes to the site plan shall be submitted for review and approval five (5) working days prior to effecting the changes.

1.6 TRADESPERSONS AND WORKMANSHIP STANDARDS

- A. General: Instigate and maintain procedures to ensure that persons performing work at site are skilled and knowledgeable in methods and craftsmanship needed to

produce required quality levels for workmanship in completed work. Remove and replace work which does not comply with workmanship standards as specified and as recognized in the construction industry for applications indicated. Remove and replace other work damaged or deteriorated by faulty workmanship or its replacement.

- B. Availability of Tradespersons: At each progress or coordination meeting, review availability of tradespersons and projected needs to accomplish work as scheduled. Require each entity employing personnel to report on events which might affect progress of work. Where possible, consider alternatives and take actions to avoid disputes and delays.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 GENERAL COORDINATION PROVISIONS

- A. Inspection of Conditions: Require the Installer of each major component to inspect both the substrate and conditions under which work is to be performed. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.
- B. Coordinate temporary enclosures with required inspections and tests to minimize the necessity of uncovering completed construction for that purpose.
- C. Manufacturer's Instructions: Comply with manufacturer's installation instructions and recommendations, to the extent that those instructions and recommendations are more explicit or stringent than requirements contained in Contract Documents.
- D. Inspect materials or equipment immediately upon delivery and again prior to installation. Reject damaged and defective items.
- E. Provide attachment and connection devices and methods necessary for securing work. Secure work true to line and level. Allow for expansion and building movement.
- F. Visual Effects: Provide uniform joint widths in exposed work. Arrange joints in exposed work to obtain the best visual effect. Refer questionable choices to the Architect for final decision.
- G. Recheck measurements and dimensions, before starting each installation.
- H. Install each component during conditions of temperature, humidity, exposure, forecasted weather and status of project completion that will ensure the best

possible results, in coordination with entire work. Isolate each part of the completed construction from incompatible material as necessary to prevent deterioration.

- I. Mounting Heights: Where mounting heights are not indicated, install individual components at standard mounting heights recognized within the industry for the particular application indicated. Refer questionable mounting height decisions to the Architect for final decision.

3.2 CLEANING AND PROTECTION

- A. Clean and protect construction in progress and adjoining materials in place, during handling and installation. Apply protective covering where required to assure protection from damage or deterioration at Substantial Completion.
- B. Clean and maintain completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to assure operability without damaging effects.
- C. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period. Where applicable, such exposures include, but are not limited to, the following:
 1. Excessive static or dynamic loading.
 2. Excessive internal or external pressures.
 3. Excessively high or low temperatures.
 4. Thermal shock.
 5. Excessively high or low humidity.
 6. Air contamination or pollution.
 7. Water or ice.
 8. Solvents.
 9. Chemicals.
 10. Light.
 11. Radiation.
 12. Puncture.
 13. Abrasion.
 14. Heavy traffic.
 15. Soiling, staining, and corrosion.
 16. Bacteria.
 17. Rodent and insect infestation.
 18. Combustion.
 19. Electrical current.
 20. High-speed operation.
 21. Improper lubrication.
 22. Unusual wear or other misuse.
 23. Contact between incompatible materials.
 24. Destructive testing.

25. Misalignment.
26. Excessive weathering.
27. Unprotected storage.
28. Improper shipping or handling.
29. Theft.
30. Vandalism.

3.3 ENVIRONMENTAL PROTECTION

- A. Soil Disposal and / or Borrow: Conduct all soil disposal and / or borrow work in accordance with requirements of local regulatory authorities. Dispose of all excess soil in a legal manner off site.
- B. Solid, Liquid and Gaseous Contaminants: Contractor shall be responsible for the proper disposal of all solid, liquid and gaseous contaminants in accordance with all local codes and regulations, together with the following requirements.
 1. Discharge gaseous contaminants so that they will be sufficiently diluted with fresh air to reduce the toxicity to an acceptable level.
 2. Liquid contaminants may, subject to local utility standards, be diluted with water to a level of quality acceptable in the local sewer system or shall be contained in approved vessels for disposal at approved sites.
- C. Disposal of Refuse: Remove refuse resulting from construction operations from the site. Burning on the site is not permissible.
- D. Hazardous Waste: All hazardous waste generated by the Contractor and the Contractor's subcontractors during the course of construction shall be stored, transported and disposed of in accordance with 40 CFR 260. The Contractor and his subcontractors shall be responsible for all documentation related to hazardous waste generated as a result of this Contract and that documentation shall be in accordance with 40 CFR 260.
- E. Construction Site Maintenance:
 1. Store all supplies and equipment on project site so as to preclude mechanical and climatic damage. Maintain site in a neat and orderly manner.
 2. Contractor shall be responsible for maintaining the temporary structures and construction enclosure (fence) in good repair and visually pleasant. Contractor shall further provide adequate security, supplementing the existing fencing as necessary, to prevent the presence of unauthorized persons on the site and to keep gates secured when not in actual use to ensure the integrity of the barrier as well as for property security.
- F. Noise Control: Comply with all applicable state and local laws, ordinances and regulations relative to noise control.

END OF SECTION 014005

SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.
- B. Related Requirements:
 - 1. Section 011000 "Summary" for work restrictions and limitations on utility interruptions.

1.2 USE CHARGES

- A. Sewer Service: Owner will pay sewer-service use charges for sewer usage by all entities for construction operations. Airport restroom facilities are available for use by Contractor.
- B. Water Service: Owner will pay water-service use charges for water used by all entities for construction operations. Water service is specific to Airport restroom usage and water fountains. It is not anticipated that Contractor will require specific water usage for construction during project.
- C. Electric Power Service from Existing System: Electric power from Owner's existing system is available for use without metering and without payment of use charges upon. Provide connections and extensions of services as required for construction operations.

1.3 INFORMATIONAL SUBMITTALS

- A. Site Utilization Plan: Show staging areas, construction site entrances, vehicle circulation, and parking areas for construction personnel.
- B. Project Identification and Temporary Signs: Show fabrication and installation details, including plans, elevations, details, layouts, typestyles, graphic elements, and message content.
- C. Fire-Safety Program: Show compliance with requirements of NFPA 241 and authorities having jurisdiction. Indicate Contractor personnel responsible for management of fire-prevention program.

- D. Moisture- and Mold-Protection Plan: Describe procedures and controls for protecting materials and construction from water absorption and damage and mold. Describe delivery, handling, storage, installation, and protection provisions for materials subject to water absorption or water damage.
1. Indicate procedures for discarding water-damaged materials, protocols for mitigating water intrusion into completed Work, and requirements for replacing water-damaged Work.
 2. Indicate sequencing of work that requires water, such as sprayed fire-resistive materials, plastering, and terrazzo grinding, and describe plans for dealing with water from these operations. Show procedures for verifying that wet construction has dried sufficiently to permit installation of finish materials.
 3. Indicate methods to be used to avoid trapping water in finished work.
- E. Dust- and HVAC-Control Plan: Submit coordination drawing and narrative that indicates the dust- and HVAC-control measures proposed for use, proposed locations, and proposed time frame for their operation. Include the following:
1. Locations of dust-control partitions at each phase of work.
 2. HVAC system isolation schematic drawing.
 3. Waste-handling procedures.
 4. Other dust-control measures.
- F. Noise and Vibration Control Plan: Identify construction activities that may impact the occupancy and use of existing spaces within the building or adjacent existing buildings, whether occupied by others, or occupied by the Owner. Include the following:
1. Methods used to meet the goals and requirements of the Owner.
 2. Concrete cutting method(s) to be used.
 3. Location of construction devices on the site.
 4. Show compliance with the use and maintenance of quieted construction devices for the duration of the Project.
 5. Indicate activities that may disturb building occupants and that are planned to be performed during non-standard working hours as coordinated with the Owner.

1.4 PROJECT CONDITIONS

- A. Temporary Use of Permanent Facilities: Engage Installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Portable Chain-Link Fencing: Minimum 2-inch , 0.148-inch- thick, galvanized-steel, chain-link fabric fencing; minimum 6 feet high with galvanized-steel pipe posts; minimum 2-3/8-inch- OD line posts and 2-7/8-inch- OD corner and pull posts, with 1-5/8-inch- OD top and bottom rails. Provide concrete or galvanized-steel bases for supporting posts.
- B. Polyethylene Sheet: Reinforced, fire-resistive sheet, 10-mil minimum thickness, with flame-spread rating of 15 or less in accordance with ASTM E84 and passing NFPA 701 Test Method 2.
- C. Dust-Control Adhesive-Surface Walk-Off Mats: Provide mats, minimum 36 by 60 inches.
- D. Insulation: Unfaced mineral-fiber blanket, manufactured from glass, slag wool, or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively.
- E. Metal Wall Panel Temporary Walls: Provide interlocking metal panels and rails designed to create temporary wall barricades. Wall panels shall be 3.5 inch thick with minimum metal thickness of 0.090 inches. Temporary wall panels shall meet Class A fire rating and shall have a minimum STC rating of 40. Walls shall be secured to existing building elements with steel studs or other components as necessary.

2.2 TEMPORARY FACILITIES

- A. Field Offices: Provide as required by Contractor and local authorities. Owner may provide conditioned interior space for field offices for duration of Project at Owner's option.

2.3 EQUIPMENT

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

PART 3 - EXECUTION

3.1 TEMPORARY FACILITIES, GENERAL

- A. Conservation: Coordinate construction and use of facilities with consideration given to conservation of energy, water, and materials. Coordinate use of utilities to minimize waste.
 - 1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. See other Sections for disposition of salvaged materials that are designated as Owner's property.

3.2 TEMPORARY UTILITY INSTALLATION

- A. Isolation of Work Areas in Occupied Facilities: Prevent dust, fumes, and odors from entering occupied areas.
- B. Electric Power Service: Connect to Owner's existing electric power service. Maintain equipment in a condition acceptable to Owner.
- C. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions if existing lighting is removed for installation of new work.
 - 1. Install and operate temporary lighting that fulfills security and life safety requirements.
- D. Traffic Controls: Comply with requirements of authorities having jurisdiction.
 - 1. Protect existing site improvements to remain, including curbs, pavement, and utilities.
 - 2. Maintain access for fire-fighting equipment and access to fire hydrants.
- E. Parking: Use designated areas of Owner's existing parking areas for construction personnel.
- F. Storage and Staging: Use designated areas of Project site for storage and staging needs.
- G. Project Signs: Provide Project signs as indicated. Unauthorized signs are not permitted.
 - 1. Temporary Signs: Provide other signs as indicated and as required to inform public and individuals seeking entrance to Project.
 - a. Provide temporary, directional signs for construction personnel and visitors.

2. Maintain and touch up signs, so they are legible at all times.
- H. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction. Comply with progress cleaning requirements in Section 017300 "Execution."
1. Installation and use of roll-off dumpsters will be limited to the hours of 11:00 PM to 4:00 AM each day.
- I. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.
1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.
- J. Existing Elevator Use: Use of Owner's existing elevators will be permitted, provided elevators are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore elevators to condition existing before initial use, including replacing worn cables, guide shoes, and similar items of limited life.
1. Do not load elevators beyond their rated weight capacity.
 2. Provide protective coverings, barriers, devices, signs, or other procedures to protect elevator car and entrance doors and frame. If, despite such protection, elevators become damaged, engage elevator Installer to restore damaged work, so no evidence remains of correction work. Return items that cannot be refinished in field to the shop, make required repairs and refinish entire unit, or provide new units as required.
- K. Existing Stair Usage: Use of Owner's existing stairs will be permitted, provided stairs are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore stairs to condition existing before initial use.
1. Provide protective coverings, barriers, devices, signs, or other procedures to protect stairs and to maintain means of egress. If stairs become damaged, restore damaged areas, so no evidence remains of correction work.

3.3 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.
1. Where access to adjacent properties is required in order to affect protection of existing facilities, obtain written permission from adjacent property owner to access property for that purpose.

- B. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
 - 1. Comply with work restrictions specified in Section 011000 "Summary."
- C. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.
- D. Temporary Egress: Provide temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction. Provide signage directing occupants to temporary egress.
- E. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241; manage fire-prevention program.
 - 1. Prohibit smoking in construction areas. Comply with additional limits on smoking specified in other Sections.
 - 2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition in accordance with requirements of authorities having jurisdiction.
 - 3. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.
 - 4. Provide temporary standpipes and hoses for fire protection. Hang hoses with a warning sign, stating that hoses are for fire-protection purposes only and are not to be removed. Match hose size with outlet size and equip with suitable nozzles.

3.4 MOISTURE AND MOLD CONTROL

- A. Moisture and Mold Protection: Protect stored materials and installed Work in accordance with Moisture and Mold Protection Plan.

3.5 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of facilities. To minimize waste and abuse, limit availability of facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal.

END OF SECTION 015000

SECTION 016000 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.
- B. Related Requirements:
 - 1. Section 012500 "Substitution Procedures" for requests for substitutions.
 - 2. Section 01770 "Closeout Procedures" for submitting warranties.

1.3 DEFINITIONS

- A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
 - 1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature that is current as of date of the Contract Documents.
 - 2. New Products: Items that have not previously been incorporated into another project or facility. Salvaged items or items reused from other projects are not considered new products. Items that are manufactured or fabricated to include recycled content materials are considered new products, unless indicated otherwise.
 - 3. Comparable Product: Product by named manufacturer that is demonstrated and approved through the comparable product submittal process described in Part 2 "Comparable Products" Article, to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.
- B. Basis-of-Design Product Specification: A specification in which a single manufacturer's product is named and accompanied by the words "basis-of-design product" or "BOD"

or is specifically noted including make or model number or other designation. Published attributes and characteristics of basis-of-design product establish salient characteristics of products.

1. Evaluation of Comparable Products: In addition to the basis-of-design product description, product attributes and characteristics may be listed to establish the significant qualities related to type, function, in-service performance and physical properties, weight, dimension, durability, visual characteristics, and other special features and requirements for purposes of evaluating comparable products of additional manufacturers named in the specification. Manufacturer's published attributes and characteristics of basis-of-design product also establish salient characteristics of products for purposes of evaluating comparable products.
- C. Subject to Compliance with Requirements: Where the phrase "Subject to compliance with requirements" introduces a product selection procedure in an individual Specification Section, provide products qualified under the specified product procedure. In the event that a named product or product by a named manufacturer does not meet the other requirements of the specifications, select another named product or product from another named manufacturer that does meet the requirements of the specifications; submit a comparable product request or substitution request, if applicable.
- D. Comparable Product Request Submittal: An action submittal requesting consideration of a comparable product, including the following information:
1. Identification of basis-of-design product or fabrication or installation method to be replaced, including Specification Section number and title and Drawing numbers and titles.
 2. Data indicating compliance with the requirements specified in Part 2 "Comparable Products" Article.
- E. Basis-of-Design Product Specification Submittal: An action submittal complying with requirements in Section 013300 "Submittal Procedures."
- F. Substitution: Refer to Section 012500 "Substitution Procedures" for definition and limitations on substitutions.
- 1.4 QUALITY ASSURANCE
- A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.
- B. Identification of Products: Except for required labels and operating data, do not attach or imprint manufacturer or product names or trademarks on exposed surfaces of

products or equipment that will be exposed to view in occupied spaces or on the exterior.

1. Labels: Locate required product labels and stamps on a concealed surface, or, where required for observation following installation, on a visually accessible surface that is not conspicuous.
2. Equipment Nameplates: Provide a permanent nameplate on each item of service- or power-operated equipment. Locate on a visually accessible but inconspicuous surface. Include information essential for operation, including the following:
 - a. Name of product and manufacturer.
 - b. Model and serial number.
 - c. Capacity.
 - d. Speed.
 - e. Ratings.
3. See individual identification Sections in Divisions 21, 22, 23, and 26 for additional equipment identification requirements.

1.5 COORDINATION

- A. Modify or adjust affected work as necessary to integrate work of approved comparable products and approved substitutions.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products, using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.
- B. Delivery and Handling:
 1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
 2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
 3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
 4. Inspect products on delivery to determine compliance with the Contract Documents and that products are undamaged and properly protected.
- C. Storage:

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

1.7 PRODUCT WARRANTIES

- A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.
 1. Manufacturer's Warranty: Written standard warranty form furnished by individual manufacturer for a particular product and issued in the name of the Owner or endorsed by manufacturer to Owner.
 2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner and issued in the name of the Owner or endorsed by manufacturer to Owner.
- B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.
 1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
 2. Specified Form: When specified forms are included in the Project Manual, prepare a written document, using indicated form properly executed.
 3. See other Sections for specific content requirements and particular requirements for submitting special warranties.
- C. Submittal Time: Comply with requirements in Section 017700 "Closeout Procedures."

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

- A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.
1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
 2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
 3. Owner reserves the right to limit selection to products with warranties meeting requirements of the Contract Documents.
 4. Where products are accompanied by the term "as selected," Architect will make selection.
 5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.
 6. Or Equal: For products specified by name and accompanied by the term "or equal," "or approved equal," or "or approved," comply with requirements in "Comparable Products" Article to obtain approval for use of an unnamed product.
 - a. Submit additional documentation required by Architect in order to establish equivalency of proposed products. Unless otherwise indicated, evaluation of "or equal" product status is by the Architect, whose determination is final.
- B. Product Selection Procedures:
1. Limited List of Products: Where Specifications include a list of names of both manufacturers and products, provide one of the products listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
 - a. Limited list of products may be indicated by the phrase "Subject to compliance with requirements, provide one of the following."
 2. Non-Limited List of Products: Where Specifications include a list of names of both available manufacturers and products, provide one of the products listed or an unnamed product that complies with requirements.

- a. Non-limited list of products is indicated by the phrase "Subject to compliance with requirements, available products that may be incorporated in the Work include, but are not limited to, the following."
 - b. Provision of an unnamed product is not considered a substitution, if the product complies with requirements.
 3. Limited List of Manufacturers: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
 - a. Limited list of manufacturers is indicated by the phrase "Subject to compliance with requirements, provide products by one of the following."
 4. Non-Limited List of Manufacturers: Where Specifications include a list of available manufacturers, provide a product by one of the manufacturers listed or a product by an unnamed manufacturer that complies with requirements.
 - a. Non-limited list of manufacturers is indicated by the phrase "Subject to compliance with requirements, available manufacturers whose products may be incorporated in the Work include, but are not limited to, the following."
 - b. Provision of products of an unnamed manufacturer is not considered a substitution, if the product complies with requirements.
 5. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications may additionally indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.
 - a. For approval of products by unnamed manufacturers, comply with requirements in Section 012500 "Substitution Procedures" for substitutions for convenience.
- C. Visual Matching Specification: Where Specifications require the phrase "match Architect's sample," provide a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.
1. If no product available within specified category matches and complies with other specified requirements, comply with requirements in Section 012500 "Substitution Procedures" for proposal of product.

- D. Visual Selection Specification: Where Specifications include the phrase "as selected by Architect from manufacturer's full range" or a similar phrase, select a product that complies with requirements. Architect will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.
- E. Sustainable Product Selection: Where Specifications require product to meet sustainable product characteristics, select products complying with indicated requirements. Comply with requirements in Division 01 sustainability requirements Section and individual Specification Sections.

2.2 COMPARABLE PRODUCTS

- A. Conditions for Consideration of Comparable Products: Architect will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Architect may return requests without action, except to record noncompliance with the following requirements:
 - 1. Evidence that proposed product does not require revisions to the Contract Documents, is consistent with the Contract Documents, will produce the indicated results, and is compatible with other portions of the Work.
 - 2. Detailed comparison of significant qualities of proposed product with those of the named basis-of-design product. Significant product qualities include attributes, such as type, function, in-service performance and physical properties, weight, dimension, durability, visual characteristics, and other specific features and requirements.
 - 3. Evidence that proposed product provides specified warranty.
 - 4. List of similar installations for completed projects, with project names and addresses and names and addresses of architects and owners, if requested.
 - 5. Samples, if requested.
- B. Architect's Action on Comparable Products Submittal: If necessary, Architect will request additional information or documentation for evaluation, as specified in Section 013300 "Submittal Procedures."
 - 1. Form of Approval of Submittal: As specified in Section 013300 "Submittal Procedures."
 - 2. Use product specified if Architect does not issue a decision on use of a comparable product request within time allocated.
- C. Submittal Requirements, Two-Step Process: Approval by the Architect of Contractor's request for use of comparable product is not intended to satisfy other submittal requirements. Comply with specified submittal requirements.

PART 3 - EXECUTION (Not Used)

END OF SECTION 016000

SECTION 017000 – CONTRACT CLOSEOUT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This section includes administrative and procedural requirements for contract closeout including, but not limited to, the following:
 - 1. Inspection procedures.
 - 2. Project record document submittal.
 - 3. Operation and maintenance manual submittal.
 - 4. Submittal of warranties.
 - 5. Final cleaning.
- B. Closeout requirements for specific construction activities are included in the appropriate sections.
- C. Definitions: Closeout is hereby defined to include general requirements near the end of Contract time, in preparation for final acceptance, final payment, normal termination of contract, occupancy by Owner and similar actions evidencing completion of the work. Time of closeout is directly related to "Substantial Completion" and, therefore, may be either a single time period for entire work or a series of time periods for individual parts of the work which have been certified as substantially complete at different dates. That time variation (if any) shall be applicable to other provisions of this section, regardless of whether resulting from "phased completion" originally specified by the Contract Documents or subsequently agreed upon by Owner and Contractor.

1.3 SUBSTANTIAL COMPLETION

- A. Certificates of Substantial Completion: Certificates of Substantial Completion will be filled out with punch lists attached and shall define the areas of the work which are being accepted. Procedures required to call for inspections and to request certificates shall be as required in this section.
- B. Preliminary Procedures: Before requesting inspection for certification of Substantial Completion, for either the entire work or portions thereof, complete the following. List exceptions in the request.
 - 1. In the Application for Payment that coincides with, or first follows, the date Substantial Completion is claimed, show 100 percent completion for the portion of the work claimed as substantially complete.

- a. Include supporting documentation for completion as indicated in these Contract Documents and a statement showing an accounting of changes to the Contract Sum.
 - b. If 100 percent completion cannot be shown, include a list of incomplete items, the value of incomplete construction, and reasons the work is not complete.
2. Advise the Owner of pending insurance changeover requirements.
 3. Submit specific warranties, workmanship bonds, maintenance agreements, final certifications, and similar documents.
 4. Obtain and submit releases enabling the Owner unrestricted use of the work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
 5. Deliver tools, spare parts, extra stock, and similar items.
 6. Make final changeover of permanent locks and transmit keys to the Owner. Advise the Owner's personnel of changeover in security provisions.
 7. Complete startup testing of systems and instruction of the Owner's operation and maintenance personnel. Discontinue or change over and remove temporary facilities and services from the site, along with mockups, construction tools, and similar elements.
 8. Complete final cleanup requirements, including touchup painting. Touch up and otherwise repair and restore marred, exposed finishes.
- C. Inspection Procedures: On receipt of a request for inspection, the Architect will either proceed with inspection or advise the Contractor of unfilled requirements. The Architect will prepare the Certificate of Substantial Completion following inspection or advise the Contractor of construction that must be completed or corrected before the certificate will be issued.
1. The Architect will repeat inspection when requested and assured that the work is substantially complete.
 2. Results of the completed inspection will form the basis of requirements for final acceptance.

1.4 FINAL ACCEPTANCE

- A. Preliminary Procedures: Before requesting final inspection for certification of final acceptance and final payment, complete the following. List exceptions in the request.
1. Submit the final payment request with releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations where required.
 2. Submit an updated final statement, accounting for final additional changes to the Contract Sum.

3. Submit a certified copy of the Architect's final inspection list of items to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance, endorsed and dated by the Architect.
 4. Submit final meter readings for utilities, a measured record of stored fuel, and similar data as of the date of Substantial Completion or when the Owner took possession of and assumed responsibility for corresponding elements of the work.
 5. Submit consent of surety to final payment.
 6. Submit a final liquidated damages settlement statement.
 7. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
 8. Submit record documents, final project photographs, property survey and similar final record information.
- B. Reinspection Procedure: The Architect will reinspect the work upon receipt of notice that the work, including inspection list items from earlier inspections, has been completed, except for items whose completion is delayed under circumstances acceptable to the Architect.
1. Upon completion of reinspection, the Architect will prepare a certificate of final acceptance. If the work is incomplete, the Architect will advise the Contractor of work that is incomplete or of obligations that have not been fulfilled but are required for final acceptance.
 2. If necessary, reinspection will be repeated. Contractor will promptly reimburse the Architect for all incurred costs.

1.5 RECORD DOCUMENT SUBMITTALS

- A. General: Do not use record documents for construction purposes. Protect record documents from deterioration and loss in a secure, fire-resistant location. Provide access to record documents for the Architect's reference during normal working hours.
- B. Record Drawings: Maintain a clean, undamaged set of blue or black line white-prints of Contract Drawings and Shop Drawings. Mark the set to show the actual installation where the installation varies substantially from the work as originally shown. Mark which drawing is most capable of showing conditions fully and accurately. Where Shop Drawings are used, record a cross-reference at the corresponding location on the Contract Drawings. Give particular attention to concealed elements that would be difficult to measure and record at a later date.
1. Mark record sets with red erasable pencil. Use other colors to distinguish between variations in separate categories of the work.
 2. Mark new information that is important to the Owner but was not shown on Contract Drawings or Shop Drawings.
 3. Note related change-order numbers where applicable.

4. Organize record drawing sheets into manageable sets. Bind sets with durable-paper cover sheets; print suitable titles, dates, and other identification on the cover of each set.
 5. Preparation of Transparencies: In preparation for certification of Substantial Completion on the last major portion of the work, review completed markup of record drawings with Architect. When authorized, proceed with preparation of a full set of corrected transparencies for Contract Drawings and shop drawings. Incorporate changes and additional information previously marked-up on print sets, by erasing and redrawing where applicable, and by adding details and notations where applicable; refer instances of uncertainty to Architect for determination. Identify and date each updated drawing.
 6. One set of transparencies of original Contract Drawings will be furnished by Architect to Contractor for use in recording changes and additional information. Other printing as required herein is Contractor's responsibility.
 7. Review of Transparencies: Prior to forwarding to Architect, submit corrected transparencies to Architect for review and acceptance. Architect will review each transparency for general scope of changes and information recorded thereon, and of the general quality of draftsmanship thereon (erasures and drafting). Transparencies will be returned to Contractor for organizing into a set and for final submittal.
 8. Copies, Distribution: At the completion of the Work the Contractor shall forward one set of original marked-up transparencies to Architect for distribution to Owner. Organize transparencies into a set matching print sets, place set in a durable tube-type drawing container (with end caps), and mark end cap with suitable identification.
- C. Record Specifications: Maintain one complete copy of the Project Manual, including addenda. Include with the Project Manual one copy of other written construction documents, such as Change Orders and modifications issued in printed form during construction.
1. Mark these documents to show substantial variations in actual work performed in comparison with the text of the Specifications and modifications.
 2. Give particular attention to substitutions and selection of options and information on concealed construction that cannot otherwise be readily discerned later by direct observation.
 3. Note related record drawing information and Product Data.
 4. Upon completion of the work, submit record Specifications to the Architect for the Owner's records.
- D. Record Sample Submitted: Immediately prior to the date or dates of Substantial Completion, the Contractor shall meet with the Architect and the Owner's personnel at the site to determine which of the submitted samples that have been maintained during progress of the work are to be transmitted to the Owner

for record purposes. Comply with the Owner's instructions regarding packaging, identification marking and delivery to the Owner's designated storage area. Dispose of other samples in a manner specified for disposal of surplus and waste materials, unless otherwise indicated by the Architect.

- E. Miscellaneous Record Submittals: Refer to other Specification Sections for requirements of miscellaneous record keeping and submittals in connection with actual performance of the work. Immediately prior to the date or dates of Substantial Completion, complete miscellaneous records and place in good order. Identify miscellaneous records properly and bind or file, ready for continued use and reference. Submit to the Architect for the Owner's records.

- F. Maintenance Manuals: Organize operation and maintenance data into suitable sets of manageable size. Bind properly indexed data in individual, heavy-duty, 2-inch, 3-ring, vinyl-covered binders, with pocket folders for folded sheet information. Mark appropriate identification on front and spine of each binder. Provide the Architect with two (2) copies of each manual. Include the following types of information:
 - 1. Emergency instructions.
 - 2. Spare parts list.
 - 3. Copies of warranties.
 - 4. Wiring diagrams.
 - 5. Recommended "turn-around" cycles.
 - 6. Inspection procedures.
 - 7. Shop Drawings and Product Data.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 CLOSEOUT PROCEDURES

- A. Operation and Maintenance Instructions: Arrange for each Installer of equipment that requires regular maintenance to meet with the Owner's personnel to provide instruction in proper operation and maintenance. Provide instruction by manufacturer's representatives if installers are not experienced in operation and maintenance procedures. Include a detailed review of the following items:
 - 1. Maintenance manuals.
 - 2. Record documents.
 - 3. Spare parts and materials.
 - 4. Tools.
 - 5. Lubricants.
 - 6. Fuels.
 - 7. Identification systems.

8. Control sequences.
 9. Hazards.
 10. Cleaning.
 11. Warranties and bonds.
 12. Maintenance agreements and similar continuing commitments.
- B. As part of instruction for operating equipment, demonstrate the following procedures:
1. Startup.
 2. Shutdown.
 3. Emergency operations.
 4. Noise and vibration adjustments.
 5. Safety procedures.
 6. Economy and efficiency adjustments.
 7. Effective energy utilization.

3.2 FINAL CLEANING

- A. General: The General Conditions require general cleaning during construction. Regular site cleaning is included in Division 1, Section 01500 - CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to the condition expected in a normal, commercial building cleaning and maintenance program. Comply with manufacturers' instructions.
1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion.
 - a. Remove labels that are not permanent labels.
 - b. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other substances that are noticeable vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials.
 - c. Clean exposed exterior and interior hard-surfaced finishes to a dust-free condition, free of stains, films, and similar foreign substances. Restore reflective surfaces to their original condition. Except as otherwise indicated, avoid disturbance of natural weathering of exterior surfaces. Leave concrete floors broom clean. Vacuum carpeted surfaces.
 - d. Wipe surfaces of mechanical and electrical equipment. Remove excess lubrication and other substances. Clean plumbing fixtures to a sanitary condition. Clean light fixtures and lamps.
 - e. Clean the site, including landscape development areas, of rubbish, litter, and other foreign substances. Sweep paved areas broom clean; remove stains, spills, and other foreign deposits. Rake

grounds that are neither paved nor planted to a smooth, even-textured surface.

- f. Remove debris and surface dust from limited access spaces including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics and similar spaces.
- C. Removal of Protection: Remove temporary protection and facilities installed for protection of the work during construction, where applicable.
 - D. Compliance: Comply with regulations of authorities having jurisdiction and safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on the Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from the site and dispose of in a lawful manner.
 1. Where extra materials of value remain after completion of associated work, they become the Owner's property. Dispose of these materials as directed by the Owner.

END OF SECTION 017000

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SECTION 017300 - EXECUTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes general administrative and procedural requirements governing execution of the Work, including, but not limited to, the following:
 - 1. Construction layout.
 - 2. Field engineering and surveying.
 - 3. Installation of the Work.
 - 4. Cutting and patching.
 - 5. Progress cleaning.
 - 6. Starting and adjusting.
 - 7. Protection of installed construction.

- B. Related Requirements:
 - 1. Section 013300 "Submittal Procedures" for submitting surveys.
 - 2. Section 017000 "Contract Closeout" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, replacing defective work, and final cleaning.
 - 3. Section 024119 "Selective Demolition" for demolition and removal of selected portions of the building.

1.2 DEFINITIONS

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

- B. Patching: Fitting and repair work required to restore construction to original conditions after installation of subsequent work.

1.3 PREINSTALLATION MEETINGS

- A. Cutting and Patching Conference: Conduct conference at Project site.
 - 1. Prior to submitting cutting and patching plan, review extent of cutting and patching anticipated and examine procedures for ensuring satisfactory result from cutting and patching work. Inform Architect of scheduled meeting. Require

representatives of each entity directly concerned with cutting and patching to attend, including the following:

- a. Contractor's superintendent.
 - b. Trade supervisor responsible for cutting operations.
 - c. Trade supervisor(s) responsible for patching of each type of substrate.
 - d. Mechanical, electrical, and utilities subcontractors' supervisors, to the extent each trade is affected by cutting and patching operations.
2. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

1.4 INFORMATIONAL SUBMITTALS

- A. Cutting and Patching Plan: Submit plan describing procedures at least 10 days prior to the time cutting and patching will be performed. Include the following information:
1. Extent: Describe reason for and extent of each occurrence of cutting and patching.
 2. Changes to In-Place Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building appearance and other significant visual elements.
 3. Products: List products to be used for patching and firms or entities that will perform patching work.
 4. Dates: Indicate when cutting and patching will be performed.
 5. Utilities and Mechanical and Electrical Systems: List services and systems that cutting and patching procedures will disturb or affect. List services and systems that will be relocated and those that will be temporarily out of service. Indicate length of time permanent services and systems will be disrupted.
 - a. Include description of provisions for temporary services and systems during interruption of permanent services and systems.
- B. Landfill Receipts: Submit copy of receipts issued by a landfill facility, licensed to accept hazardous materials, for hazardous waste disposal.

1.5 QUALITY ASSURANCE

- A. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.
1. Structural Elements: When cutting and patching structural elements, or when encountering the need for cutting and patching of elements whose structural function is not known, notify Architect of locations and details of cutting and

- await directions from Architect before proceeding. Shore, brace, and support structural elements during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection.
- a. Fire-protection of structural elements requiring cutting and patching shall be included in project to restore conditions prior to construction.
2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety. Operational elements include the following:
- a. Primary operational systems and equipment.
 - b. Fire separation assemblies.
 - c. Air or smoke barriers.
 - d. Fire-suppression systems.
 - e. Plumbing piping systems.
 - f. Mechanical systems piping and ducts.
 - g. Control systems.
 - h. Communication systems.
 - i. Fire-detection and -alarm systems.
 - j. Conveying systems.
 - k. Electrical wiring systems.
 - l. Operating systems of special construction.
3. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety unless approved by Architect. Other construction elements include but are not limited to the following:
- a. Water, moisture, or vapor barriers.
 - b. Membranes and flashings.
 - c. Exterior curtain-wall construction.
 - d. Sprayed fire-resistive material.
 - e. Equipment supports.
 - f. Piping, ductwork, vessels, and equipment.
 - g. Noise- and vibration-control elements and systems.
4. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

- B. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of specified products and equipment.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Comply with requirements specified in other Sections.
 - 1. For projects requiring compliance with sustainable design and construction practices and procedures, use products for patching that comply with sustainable design requirements.
- B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
 - 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Architect for the visual and functional performance of in-place materials. Use materials that are not considered hazardous.
- C. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.
 - 1. Use cleaning products that comply with Green Seal's GS-37, or if GS-37 is not applicable, use products that comply with the California Code of Regulations maximum allowable VOC levels.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities, mechanical and electrical systems, and other construction affecting the Work.
- B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present

where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.

1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
 2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
 3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
- C. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:
1. Description of the Work, including Specification Section number and paragraph, and Drawing sheet number and detail, where applicable.
 2. List of detrimental conditions, including substrates.
 3. List of unacceptable installation tolerances.
 4. Recommended corrections.
- D. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- B. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- C. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents, submit a request for information to Architect in accordance with requirements in Section 013100 "Project Management and Coordination."

3.3 INSTALLATION

- A. Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
1. Make vertical work plumb and make horizontal work level.

2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
 3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.
 4. Maintain minimum headroom clearance of 96 inches in occupied spaces and 90 inches in unoccupied spaces, unless otherwise indicated on Drawings.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure satisfactory results as judged by Architect. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations, so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy of type expected for Project.
- E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on-site and placement in permanent locations.
- F. Tools and Equipment: Select tools or equipment that minimize production of excessive noise levels.
- G. Templates: Obtain and distribute to the parties involved templates for Work specified to be factory prepared and field installed. Check Shop Drawings of other portions of the Work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions with manufacturer.
1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
 2. Allow for building movement, including thermal expansion and contraction.
 3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
- I. Joints: Make joints of uniform width. Where joint locations in exposed Work are not indicated, arrange joints for the best visual effect, as judged by Architect. Fit exposed connections together to form hairline joints.

- J. Repair or remove and replace damaged, defective, or nonconforming Work.
 - 1. Comply with Section 017700 "Closeout Procedures" for repairing or removing and replacing defective Work.

3.4 CUTTING AND PATCHING

- A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
 - 1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.
- C. Temporary Support: Provide temporary support of Work to be cut.
- D. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- E. Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching in accordance with requirements in Section 011000 "Summary."
- F. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to prevent interruption to occupied areas.
- G. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
 - 1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 - 2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
 - 3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.

4. Excavating and Backfilling: Comply with requirements in applicable Sections where required by cutting and patching operations.
 5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
 6. Proceed with patching after construction operations requiring cutting are complete.
- H. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as practicable, as judged by Architect. Provide materials and comply with installation requirements specified in other Sections, where applicable.
1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
 2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
 - a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
 - b. Restore damaged pipe covering to its original condition.
 3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
 - a. Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing the patch, corner to corner of wall and edge to edge of ceiling. Provide additional coats until patch blends with adjacent surfaces.
 4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
 5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.
- I. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

3.5 PROGRESS CLEANING

- A. Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
 - 1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
 - 2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F.
 - 3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
 - a. Use containers intended for holding waste materials of type to be stored.
 - 4. Coordinate progress cleaning for joint-use areas where Contractor and other contractors are working concurrently.
- B. Site: Maintain Project site free of waste materials and debris.
- C. Work Areas: Clean areas where Work is in progress to the level of cleanliness necessary for proper execution of the Work.
 - 1. Remove liquid spills promptly.
 - 2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
- D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- F. Exposed Surfaces: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways. Comply with waste disposal requirements in Section 015000 "Temporary Facilities and Controls."
- H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

- I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- J. Limiting Exposures: Supervise construction operations to ensure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.6 STARTING AND ADJUSTING

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

3.7 PROTECTION AND REPAIR OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.
- B. Repair Work previously completed and subsequently damaged during construction period. Repair to like-new condition.
- C. Protection of Existing Items: Provide protection and ensure that existing items to remain undisturbed by construction are maintained in condition that existed at commencement of the Work.
- D. Comply with manufacturer's written instructions for temperature and relative humidity.

END OF SECTION 017300

SECTION 017400 WARRANTIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This section specifies general administrative and procedural requirements for warranties required by the Contract Documents, including manufacturers' standard warranties on products and special warranties.
 - 1. Refer to the General Conditions for terms of the Contractor's period for correction of the work and special warranty of workmanship and materials.
- B. The Contractor will provide a warranty on all project work (including that added by subsequent change order after execution of the construction contract) for a period of one (1) year following the formal declaration of Substantial Completion. This one (1) year warranty will be separate from and in no way affect other standard product / manufacturer or workmanship warranties that extend beyond this one (1) year period for goods and services provided to this project.
- C. Related Sections: The following sections contain requirements that relate to this section:
 - 1. Division 1, Section 013300 – SUBMITTAL PROCEDURES specifies procedures for submitting warranties.
 - 2. Division 1, Section 017000 - CONTRACT CLOSEOUT specifies contract closeout procedures.
 - 3. Divisions 2 through 34 sections for specific requirements for warranties on products and installations specified to be warranted.
 - 4. Certifications and other commitments and agreements for continuing services to Owner are specified elsewhere in the Contract Documents.
- D. Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the work that incorporates the products. Manufacturer's disclaimers and limitations on product warranties do not relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with the Contractor.

1.3 WARRANTY REQUIREMENTS

- A. Related Damages and Losses: When correcting failed or damaged warranted construction, remove and replace other work that has been damaged as a result of such failure or must be removed and replaced to provide access for correction of warranted construction.
- B. Reinstatement of Warranty: When work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.
- C. Replacement Cost: Upon determination that work covered by a warranty has failed, replace or rebuild the work to an acceptable condition complying with requirements of the Contract Documents. The Contractor is responsible for the cost of replacing or rebuilding defective work regardless of whether the Owner has benefited from use of the work through a portion of its anticipated useful service life.
- D. Owner's Recourse: Expressed warranties made to the Owner are in addition to implied warranties and shall not limit the duties, obligations, rights, and remedies otherwise available under the law. Expressed warranty periods shall not be interpreted as limitations on the time in which the Owner can enforce such other duties, obligations, rights, or remedies.
 - 1. Rejection of Warranties: The Owner reserves the right to reject warranties and to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
- E. Where the Contract Documents require a special warranty, or similar commitment on the work or part of the work, the Owner reserves the right to refuse to accept the work, until the Contractor presents evidence that entities required to countersign such commitments are willing to do so.

1.4 SUBMITTALS

- A. Submit written warranties to the Architect prior to the date certified for Substantial Completion. If the Architect's Certificate of Substantial Completion designates a commencement date for warranties other than the date of Substantial Completion for the work, or a designated portion of the work, submit written warranties upon request of the Architect.
 - 1. When a designated portion of the work is completed and occupied or used by the Owner, by separate agreement with the Contractor during the construction

period, submit properly executed warranties to the Architect within fifteen (15) days of completion of that designated portion of the work.

- B. When the Contract Documents require the Contractor, or the Contractor and a subcontractor, supplier or manufacturer to execute a special warranty, prepare a written document that contains appropriate terms and identification, ready for execution by the required parties. Submit a draft to the Owner, through the Architect, for approval prior to final execution.
 - 1. Refer to Divisions 2 through 41 sections for specific content requirements and particular requirements for submitting special warranties.
- C. Form of Submittal: At Final Completion compile two (2) copies of each required warranty properly executed by the Contractor, or by the Contractor, subcontractor, supplier, or manufacturer. Organize the warranty documents into an orderly sequence based on the table of contents of the Project Manual.
- D. Bind warranties and bonds in heavy-duty, commercial-quality, durable 3-ring, vinyl-covered loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.
 - 1. Provide heavy paper dividers with celluloid covered tabs for each separate warranty. Mark the tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product, and the name, address, and telephone number of the Installer.
 - 2. Identify each binder on the front and spine with the typed or printed title "WARRANTIES AND BONDS," Project title or name, and name of the Contractor.
 - 3. When warranted construction requires operation and maintenance manuals, provide additional copies of each required warranty, as necessary, for inclusion in each required manual.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 017400

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SECTION 017419 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for the following:
 - 1. Salvaging nonhazardous demolition waste.
 - 2. Recycling nonhazardous demolition and construction waste.
 - 3. Disposing of nonhazardous demolition and construction waste.

1.3 DEFINITIONS

- A. Construction Waste: Building, structure, and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
- B. Demolition Waste: Building, structure, and site improvement materials resulting from demolition operations.
- C. Disposal: Removal of demolition or construction waste and subsequent salvage, sale, recycling, or deposit in landfill, incinerator acceptable to authorities having jurisdiction, or designated spoil areas on Owner's property.
- D. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.
- E. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

1.4 MATERIALS OWNERSHIP

- A. Unless otherwise indicated, demolition and construction waste becomes property of Contractor.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 DISPOSAL OF WASTE

- A. General: Except for items or materials to be salvaged, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.
 - 1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
 - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. General: Except for items or materials to be salvaged or recycled, remove waste materials and legally dispose of at designated spoil areas on Owner's property.
- C. Burning: Do not burn waste materials.
- D. Removal from site: Construction waste shall be removed from site daily. Use of roll off dumpsters for collection of waste is permitted. Roll-off dumpsters may be placed on site between the hours of 11:00 PM and 4:00 AM daily. Dumpsters shall be located as coordinated with airport staff, and shall be removed daily from the site. Dumpsters shall not be permitted to remain on site during normal passenger traffic hours, generally between 4:00 AM and 11:00 PM daily.

END OF SECTION 017419

SECTION 017823 - OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
 - 1. Operation and maintenance documentation directory manuals.
 - 2. Emergency manuals.
 - 3. Systems and equipment operation manuals.
 - 4. Systems and equipment maintenance manuals.
 - 5. Product maintenance manuals.
- B. Related Requirements:
 - 1. Section 013300 "Submittal Procedures" for submitting copies of submittals for operation and maintenance manuals.

1.2 DEFINITIONS

- A. System: An organized collection of parts, equipment, or subsystems united by regular interaction.
- B. Subsystem: A portion of a system with characteristics similar to a system.

1.3 CLOSEOUT SUBMITTALS

- A. Submit operation and maintenance manuals indicated. Provide content for each manual as specified in individual Specification Sections, and as reviewed and approved at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.
 - 1. Architect will comment on whether content of operation and maintenance submittals is acceptable.
 - 2. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.
- B. Format: Submit operation and maintenance manuals in the following format:
 - 1. Submit on digital media such as PDF.

- C. Final Manual Submittal: Submit each manual in final form at least 15 days before commencing demonstration and training. Architect will return copy with comments.
 - 1. Correct or revise each manual to comply with Architect's comments. Submit copies of each corrected manual within **15** days of receipt of Architect's comments and prior to commencing demonstration and training.
- D. Comply with Section 017000 "Contract Closeout" for schedule for submitting operation and maintenance documentation.

1.4 FORMAT OF OPERATION AND MAINTENANCE MANUALS

- A. Manuals, Electronic Files: Submit manuals in the form of a multiple file composite electronic PDF file for each manual type required.
 - 1. Electronic Files: Use electronic files prepared by manufacturer where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size.
 - 2. File Names and Bookmarks: Bookmark individual documents based on file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment names in a readily navigated file tree. Configure electronic manual to display bookmark panel on opening file.

1.5 REQUIREMENTS FOR EMERGENCY, OPERATION, AND MAINTENANCE MANUALS

- A. Organization of Manuals: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:
 - 1. Title page.
 - 2. Table of contents.
 - 3. Manual contents.
- B. Title Page: Include the following information:
 - 1. Subject matter included in manual.
 - 2. Name and address of Project.
 - 3. Name and address of Owner.
 - 4. Date of submittal.
 - 5. Name and contact information for Contractor.

6. Name and contact information for Construction Manager.
 7. Name and contact information for Architect.
 8. Name and contact information for Commissioning Authority.
 9. Names and contact information for major consultants to the Architect that designed the systems contained in the manuals.
 10. Cross-reference to related systems in other operation and maintenance manuals.
- C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.

1.6 SYSTEMS AND EQUIPMENT OPERATION MANUALS

- A. Systems and Equipment Operation Manual: Assemble a complete set of data indicating operation of each system, subsystem, and piece of equipment not part of a system. Include information required for daily operation and management, operating standards, and routine and special operating procedures.
1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
 2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.
- B. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:
1. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
 2. Performance and design criteria if Contractor has delegated design responsibility.
 3. Operating standards.
 4. Operating procedures.
 5. Operating logs.
 6. Wiring diagrams.
 7. Control diagrams.
 8. Piped system diagrams.
 9. Precautions against improper use.
 10. License requirements including inspection and renewal dates.
- C. Descriptions: Include the following:
1. Product name and model number. Use designations for products indicated on Contract Documents.
 2. Manufacturer's name.

3. Equipment identification with serial number of each component.
4. Equipment function.
5. Operating characteristics.
6. Limiting conditions.
7. Performance curves.
8. Engineering data and tests.
9. Complete nomenclature and number of replacement parts.

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

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

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

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

1.7 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS

A. Systems and Equipment Maintenance Manuals: Assemble a complete set of data indicating maintenance of each system, subsystem, and piece of equipment not part of a system. Include manufacturers' maintenance documentation, preventive maintenance procedures and frequency, repair procedures, wiring and systems diagrams, lists of spare parts, and warranty information.

1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.

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

- C. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.
- D. Manufacturers' Maintenance Documentation: Include the following information for each component part or piece of equipment:
1. Standard maintenance instructions and bulletins; include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
 - a. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.
 2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
 3. Identification and nomenclature of parts and components.
 4. List of items recommended to be stocked as spare parts.
- E. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:
1. Test and inspection instructions.
 2. Troubleshooting guide.
 3. Precautions against improper maintenance.
 4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
 5. Aligning, adjusting, and checking instructions.
 6. Demonstration and training video recording, if available.
- F. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
 2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.

- G. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.
- H. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
 - 1. Include procedures to follow and required notifications for warranty claims.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 017823

SECTION 017839 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for Project Record Documents, including the following:
 - 1. Record Drawings.
 - 2. Record specifications.
 - 3. Record Product Data.
 - 4. Miscellaneous record submittals.

- B. Related Requirements:
 - 1. Section 017300 "Execution" for final property survey.
 - 2. Section 017700 "Closeout Procedures" for general closeout procedures.
 - 3. Section 017823 "Operation and Maintenance Data" for operation and maintenance manual requirements.

1.2 CLOSEOUT SUBMITTALS

- A. Record Drawings: Comply with the following:
 - 1. Number of Copies: Submit one set(s) of marked-up record prints.
 - 2. Number of Copies: Submit copies of Record Drawings as follows:
 - a. Initial Submittal:
 - 1) Submit one paper-copy set(s) of marked-up record prints.
 - 2) Submit PDF electronic files of scanned record prints.
 - 3) Architect will indicate whether general scope of changes, additional information recorded, and quality of drafting are acceptable.

 - b. Final Submittal:
 - 1) Submit three paper-copy set(s) of marked-up record prints.
 - 2) Submit PDF electronic files of scanned Record Prints.
 - 3) Print each drawing, whether or not changes and additional information were recorded.

- B. Record Specifications: Submit annotated PDF electronic files and one paper copy of Project's Specifications, including addenda and Contract modifications.
- C. Record Product Data: Submit annotated PDF electronic files and directories and one paper copies of each submittal.
 - 1. Where record Product Data are required as part of operation and maintenance manuals, submit duplicate marked-up Product Data as a component of manual.
- D. Miscellaneous Record Submittals: See other Specification Sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities. Submit annotated PDF electronic files and directories and of each submittal.
- E. Reports: Submit written report indicating items incorporated into Project Record Documents concurrent with progress of the Work, including revisions, concealed conditions, field changes, product selections, and other notations incorporated.

1.3 RECORD DRAWINGS

- A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued.
 - 1. Preparation: Mark record prints to show the actual installation, where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.
 - a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
 - b. Accurately record information in an acceptable drawing technique.
 - c. Record data as soon as possible after obtaining it.
 - d. Record and check the markup before enclosing concealed installations.
 - e. Cross-reference record prints to corresponding photographic documentation.
 - 2. Content: Types of items requiring marking include, but are not limited to, the following:
 - a. Dimensional changes to Drawings.
 - b. Revisions to details shown on Drawings.
 - c. Revisions to routing of piping and conduits.
 - d. Revisions to electrical circuitry.
 - e. Actual equipment locations.

- f. Duct size and routing.
 - g. Locations of concealed internal utilities.
 - h. Changes made by Change Order or Change Directive.
 - i. Changes made following Architect's written orders.
 - j. Details not on the original Contract Drawings.
 - k. Field records for variable and concealed conditions.
 - l. Record information on the Work that is shown only schematically.
3. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
 4. Mark record prints with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
 5. Mark important additional information that was either shown schematically or omitted from original Drawings.
 6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- B. Record Digital Data Files: Immediately before inspection for Certificate of Substantial Completion, review marked-up record prints with Architect. When authorized, prepare a full set of corrected digital data files of the Contract Drawings, as follows:
1. Format: Annotated PDF electronic file with comment function enabled.
 2. Incorporate changes and additional information previously marked on record prints. Delete, redraw, and add details and notations where applicable.
 3. Refer instances of uncertainty to Architect for resolution.
 4. Architect will furnish Contractor with one set of digital data files of the Contract Drawings for use in recording information.
 - a. See Section 013100 "Project Management and Coordination" for requirements related to use of Architect's digital data files.
 - b. Architect will provide data file layer information. Record markups in separate layers.
- C. Format: Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
1. Record Prints: Organize record prints into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
 2. Format: Annotated PDF electronic file with comment function enabled.
 3. Record Digital Data Files: Organize digital data information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each digital data file.

4. Identification: As follows:
 - a. Project name.
 - b. Date.
 - c. Designation "PROJECT RECORD DRAWINGS."
 - d. Name of Architect and Construction Manager.
 - e. Name of Contractor.

1.4 RECORD SPECIFICATIONS

- A. Preparation: Mark Specifications to indicate the actual product installation, where installation varies from that indicated in Specifications, addenda, and Contract modifications.
 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
 3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
 4. For each principal product, indicate whether Record Product Data has been submitted in operation and maintenance manuals instead of submitted as Record Product Data.
 5. Note related Change Orders, Record Product Data, and Record Drawings where applicable.
- B. Format: Submit record specifications as annotated PDF electronic file.

1.5 RECORD PRODUCT DATA

- A. Recording: Maintain one copy of each submittal during the construction period for Project Record Document purposes. Post changes and revisions to Project Record Documents as they occur; do not wait until end of Project.
- B. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
 3. Note related Change Orders, Record Specifications, and Record Drawings where applicable.

- C. Format: Submit Record Product Data as annotated PDF electronic file.
 - 1. Include Record Product Data directory organized by Specification Section number and title, electronically linked to each item of Record Product Data.

1.6 MISCELLANEOUS RECORD SUBMITTALS

- A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.
- B. Format: Submit miscellaneous record submittals as PDF electronic file.
 - 1. Include miscellaneous record submittals directory organized by Specification Section number and title, electronically linked to each item of miscellaneous record submittals.

1.7 MAINTENANCE OF RECORD DOCUMENTS

- A. Maintenance of Record Documents: Store Record Documents in the field office apart from the Contract Documents used for construction. Do not use Project Record Documents for construction purposes. Maintain Record Documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to Project Record Documents for Architect's reference during normal working hours.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 017839

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SECTION 017900 - DEMONSTRATION AND TRAINING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for instructing Owner's personnel, including the following:
 - 1. Instruction in operation and maintenance of systems, subsystems, and equipment.
 - 2. Demonstration and training video recordings.

1.3 INFORMATIONAL SUBMITTALS

- A. None.

1.4 COORDINATION

- A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations and to ensure availability of Owner's personnel.

1.5 INSTRUCTION

- A. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment.
- B. Scheduling: Provide instruction at mutually agreed-on times. Include up to 4 hours of demonstration and training sessions and support.
- C. Training Location and Reference Material: Conduct training on-site in the completed and fully operational facility using the actual equipment in-place. Conduct training using final operation and maintenance data submittals.
- D. Cleanup: Collect used and leftover educational materials and give to Owner. Remove instructional equipment. Restore systems and equipment to condition existing before initial training use.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 017900

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SECTION 024119 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

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

1.2 MATERIALS OWNERSHIP

A. Unless otherwise indicated, demolition waste becomes property of Contractor.

B. Items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.

1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

1.3 PREINSTALLATION MEETINGS

A. Pre-demolition Conference: Conduct conference at Project site.

1. Inspect and discuss condition of construction to be selectively demolished.
2. Review structural load limitations of existing structure.
3. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.
4. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.
5. Review areas where existing construction is to remain and requires protection.

1.4 INFORMATIONAL SUBMITTALS

A. Proposed Protection Measures: Submit report, including drawings, that indicates the measures proposed for protecting individuals and property, for environmental protection, for dust control, and for noise control. Indicate proposed locations and construction of barriers.

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

1. Detailed sequence of selective demolition and removal work, with starting and

2. ending dates for each activity. Ensure Owner's on-site operations are uninterrupted.
 3. Interruption of utility services. Indicate how long utility services will be interrupted.
 4. Coordination for shutoff, capping, and continuation of utility services.
 5. Use of elevator and stairs.
 6. Coordination of Owner's continuing occupancy of portions of existing building and of Owner's partial occupancy of completed Work.
- C. Predemolition Photographs or Video: Submit before Work begins.
- D. Warranties: Documentation indicated that existing warranties are still in effect after completion of selective demolition.
- 1.5 CLOSEOUT SUBMITTALS
- A. Inventory: Submit a list of items that have been removed and salvaged.
- 1.6 QUALITY ASSURANCE
- A. Refrigerant Recovery Technician Qualifications: Certified by an EPA-approved certification program.
- 1.7 FIELD CONDITIONS
- A. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
- B. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- C. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
1. If suspected hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.
- D. Storage or sale of removed items or materials on-site is not permitted.
- E. Utility Service: Maintain existing utilities not indicated to be demoed or temporarily removed in service and protect them against damage during selective demolition operations.
1. Maintain fire-protection facilities in service during selective demolition operations.

1.8 WARRANTY

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials so as not to void existing warranties. Notify warrantor before proceeding.
- B. Notify warrantor on completion of selective demolition, and obtain documentation verifying that existing system has been inspected and warranty remains in effect. Submit documentation at Project closeout.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Standards: Comply with ANSI/ASSE A10.6 and NFPA 241.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped before starting selective demolition operations.
- B. Contractor shall request from Owner and review record documents of existing construction; Owner does not guarantee that existing conditions are same as those indicated in record documents.
- C. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
- D. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Architect.
- E. Perform an engineering survey of condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective building demolition operations.
 - 1. Perform surveys as the Work progresses to detect hazards resulting from selective

demolition activities.

- F. Survey of Existing Conditions: Record existing conditions by use of preconstruction photographs.
 - 1. Inventory and record the condition of items to be removed and salvaged. Provide photographs or video of conditions that might be misconstrued as damage caused by salvage operations.
 - 2. Before selective demolition or removal of existing building elements that will be reproduced or duplicated in final Work, make permanent record of measurements, materials, and construction details required to make exact reproduction.

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Services/Systems to Remain: Maintain services/systems not indicated to be demo'd or temporarily removed and protect them against damage.
- B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.
 - 1. Owner will arrange to shut off indicated services/systems when requested by Contractor.
 - 2. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
 - 3. Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC systems, equipment, and components indicated to be removed.
 - a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
 - b. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
 - c. Ducts to Be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.

3.3 PREPARATION

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

prevent injury to people and damage to adjacent buildings and facilities to remain.

1. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
 2. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
 3. Cover and protect furniture, furnishings, and equipment that have not been removed.
- C. Temporary Shoring: Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.
1. Strengthen or add new supports when required during progress of selective demolition.

3.4 SELECTIVE DEMOLITION, GENERAL

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

9. Dispose of demolished items and materials promptly.

B. Removed and Reinstalled Items:

1. Clean and repair items to functional condition adequate for intended reuse.
2. Pack or crate items after cleaning and repairing. Identify contents of containers.
3. Protect items from damage during transport and storage.
4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

C. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete. Existing Items to Remain that are damaged by the contractor during construction shall be repaired to match the existing condition at contractor's expense.

3.5 DISPOSAL OF DEMOLISHED MATERIALS

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

1. Do not allow demolished materials to accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.

B. Burning: Do not burn demolished materials.

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

3.6 CLEANING

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

END OF SECTION 024119



Charlottesville-Albemarle Airport

BAGGAGE HANDLING SYSTEM SPECIFICATION

**Issued For Bid
09 February 2024**

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PART 1. – GENERAL

1.1 RELATED DOCUMENTS

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

1.2 PROJECT OVERVIEW

1.2.1 General

This project replaces the existing inbound and outbound baggage handling systems. The footprint/layout of the new systems will be the same as the existing systems. The new outbound system will be comprised of (2) new ticket counter conveyors that feed to a new T-Transfer take away belt. The T-Transfer take away belt feeds a manual screening operation, consisting of a stand-alone (1) EDS machine (CT80). All cleared bags are manually fed onto the new flat plate make up unit. The new inbound system includes (1) new slope plate claim unit and the conveyor feed line. The specification and drawings comprise the baggage handling portion of the overall project.

This specification details performance requirements established by airport baggage handling standards and by TSA document Planning Guidelines and Design Standards (PGDS). The final design is the delegated responsibility of the baggage handling contractor.

1.2.2 Project Scope Overview

1.2.2.1 Outbound and Inbound Baggage System Replacement

- a) **The Outbound Baggage System** will be replaced in kind using the same footprint/layout. The outbound system is configured using the T-Transfer method from the ticket counter to the CBRA area. The baggage is manually moved through the screening machine and feed manually on to a flat plate make-up unit.

The Inbound Baggage System will also be replaced in kind using the same footprint/layout. The inbound system is configured using a load belt feeding an incline conveyor, two transport conveyors that feed a sloped plate (Incline plate) baggage claim carousel.

- b) Phased demolition and installation shall be required to minimize the impact on airport operations as indicated in the contract drawings, sheet numbers B1.2.01 – B1.2.03.
- c) The BHS contractor must coordinate all phases of the Installation with the owner and its representatives RS&H and JSM, the OAR's. These systems are being removed and installed in an operational airport and measures must be taken to protect the passengers, airport and airline staff and the existing infrastructure and artwork (claim unit back wall). Airline operations hours are from 4:00am to 8:00pm.

-
- d) Contractor shall provide baggage portering personnel to avoid impacting airline operations during all the phases of work.
 - e) Demolition of all existing outbound conveyors shall be the responsibility of the BHS contractor. All existing MCPs and associated wiring shall be demolished back to the source. The contractor shall notify the airport prior to removal of components from site for their consideration in keeping components for spares. The airport will notify the contractor within two (2) days of review of the equipment for components to be discarded versus retained by the airport.

The existing outbound BHS to be demolished consists of two (2) stainless steel-clad ticket counter conveyors in the public area and two transport conveyors located in a tunnel that feed a roller conveyor and a flat plate make-up unit in the bagroom.

The existing inbound BHS to be demolished consists of one (1) load belt feeding one (1) incline conveyor, two (2) transport conveyors that feed a sloped plate (incline plate) baggage claim carousel.

- f) The BHS contractor will be required to configure the existing outbound EDS support roller conveyors and controls for temporary operation and processing.
- g) During demolition and construction, it will be the responsibility of the BHS contractor to move baggage as follows:
 - 1) To move checked bags from the ticket counters back to the CBRA operation area and deliver them to the TSA for screening.
 - 2) To move cleared bags from CBRA, following TSA screening, to the Make-Up Area for sortation to the appropriate aircraft.
 - 3) To move inbound bags from the aircraft drop off location into the claim area for customer pickup.
- h) The BHS contractor shall manufacture and install the new inbound and outbound systems as shown on the contract drawings. These systems consist of:
 - 1. Outbound
 - a. Two (2) ticketing conveyors (TC1-01 and TC1-02)
 - b. Two (2) transport take away conveyors (TC1-03 and TC1-04)
 - c. Two (2) security/fire doors
 - d. One (1) Flat Plate Make-up unit
 - e. One (1) MCP

Note: The existing roller conveyor shall be reused.

2. Inbound

- a. One (1) feed conveyor (IB1-01)
 - b. One (1) incline conveyor (IB1-02)
 - c. Two (2) transport conveyors (IB1-03 and IB1-04)
 - d. One (1) sloped plate claim carousel
 - e. One (1) MCP
- i) New control systems shall be installed for both inbound and outbound systems. The new MCP's (2), field control devices and wiring. The MCP's for the systems shall contain the motor control devices, estop relays, fusing, breakers, remote I/O modules and Ethernet/IP network devices.
 - j) A maintenance diagnostic system (MDS) shall be provided for each area of the BHS. A panel PC, mounted to the door of the MCP, shall be provided to monitor the portion of the BHS being controlled.
 - k) The BHS contractor shall perform all testing and commissioning required by this specification. All labor and test material for testing of the outbound and inbound shall be considered as part of the BHS contractor's scope. This includes the needed staffing to handle luggage for testing as well as proper support to handle any issues that may arise during testing while not negatively impacting the project schedule and testing.
 - l) OEM manuals and closeout documentation shall be provided by the BHS contractor. This includes source code for all programming done in this project, PLC, MDS, MIS and HMI software. Drawings shall be supplied in their native electronic format such as ACAD ".dwg" or Revit ".rvt" files.

1.2.3 Concept of Operations

1.2.3.1 Inbound Operation

To start the inbound system, airline personnel must first swipe an access security card to initiate the system start-up. After pressing the START pushbutton on a load belt control station, the associated fire/security door will open, and the inbound system will start after a set time delay to allow for the appropriate local start alarms. The inbound conveyors will start up in a reverse cascade method if they are not already in operation from the claim unit back to the load belt. Inbound bags are loaded onto the IB1 belt and transported to the claim unit.

All bags loaded onto the IB1 load belts will be loaded upstream of a head-end photocell just prior to the conveyor lines inclining into the public space. An over height photocell will be installed on the load line, IB1. When an oversize bag is detected, the IB line will stop and require the airline personnel to remove

the bag. Appropriate oversize indications are provided to alert the airline personnel of these oversize events.

1.2.3.2 Outbound Operation

To start the outbound system, ticketing agents must first swipe an access security card to initiate the system start-up. After pressing the START pushbutton on a local ticket counter control station, the associated fire/security door will open, and the load belts will start after a set time delay to allow for the appropriate local start alarms. The transport conveyors downstream of the ticketing line will also start up in a reverse cascade method if they are not already in operation. All bags are loaded onto the TC1-01 and TC1-02 ticketing load belts. Bags are fed onto TC1-03 transport take away conveyors via the T-Transfer method.

1.2.3.3 Oversized (OS) and Non-Conveyable

Non-conveyable items cannot / will not (does not physically fall within the parameters of the allowable size and/or weight for the conveyor) or should not (live animals, fragile items, etc.) be transported on the conveyor for normal luggage processing. These items will be deemed non-conveyable. Items that are deemed non-conveyable by the airline personnel ticketing agents or detected as such by the OB/IB line sensors, will be transported by an agent to the appropriate locations.

For outbound, items deemed non-conveyable will be transported, via hand cart, by an agent of the airline(s) from the ticketing area to the CBRA TSA screening area for processing. It will be left for the TSA to screen via local protocol and then will be picked up by an agent of the airline(s) and transferred to baggage makeup for flight disposition.

For inbound, items deemed non-conveyable will be transported, via hand cart, by an agent of the airline(s) through the man door into the claim area for pick-up by the passenger.

1.2.3.4 Clear Bags

Bags with a Level 1 EDS CLEAR decision will be slid onto the flat plate make-up unit for sortation.

1.2.3.5 Alarm Bags

If the bags have gone through Level 1 inspection in the EDS machine and have a status of "non-clear" when they exit the machine they will be manually removed from the line and are placed on a table by the TSO for additional screening.

Once the bag is screened by the TSO and has been cleared, the TSO will slide the bag from the inspection table back on to the roller conveyor and moved onto the flat plate make-up unit for sortation.

1.3 RELATED DOCUMENTS

1.3.1 General

- a) Applicable provisions of the contract, including conditions of the contract, Architect/Engineering Drawings and all General Requirements of the contract apply to this specification.
- b) In all cases where a device or part of the equipment is herein referred to in the singular number, it is intended that such reference shall apply to as many such devices as are required to satisfactorily complete the installation.
- c) In the event any related documents, including specifications, drawings, codes and regulations conflict with each other, the BHS contractor shall notify the Owner (or OAR) of the discrepancy in writing. The Owner (or OAR) shall then advise the BHS contractor as to which document shall govern. Until the conflict is resolved, the most stringent resolution shall be followed.

1.3.2 Contract Drawings

Refer to Index Sheet of the contract drawing set for a list of all applicable drawings.

1.3.3 Existing Documentation and Information.

- a) Information regarding existing conveyor equipment designated for modification or to remain, such as but not limited to: Mechanical and Electrical as-built documents/information, O&M manuals, computer/PLC architecture and layout drawings/documents, PLC/computer software and source codes along with other relative documentation relating to the existing BHS shall be obtained from the Owner (or OAR) if available.
- b) Contact the Owner (or OAR) and request the necessary documents, existing software and source codes that would be required for the system alterations/additions, and for coordination and reference purposes, between the existing systems and the specified BHS Project (additions and/or modifications).
- c) The BHS contractor may also make arrangements to search the Owner's library of "Record Documents" for drawings, manuals, and other applicable information that may be relevant to the Project.
- d) The Owner makes no guarantees regarding the accuracy or completeness of the files in their library. It is the BHS contractor's responsibility to verify all information gathered from that source.
- e) If As-built documentation is not available, the BHS contractor shall engage the necessary staff to obtain the needed information on the existing conveyor systems and equipment, via site survey.
- f) The BHS contractor is responsible for submitting complete and comprehensive Project documentation for this work during the drawing submittal phases. Any

pertinent information or documentation that is not available from the Owner's records shall be generated by the BHS contractor in compliance with the Owner's or Owner's Authorized Representative's (OAR's) documentation standards.

1.3.4 Special Related Documents

1.3.5 Other Documentation

- a) The BHS contractor shall obtain and comply with all applicable codes and regulations having jurisdiction for the Project.
- b) BHS contractor shall obtain necessary documentation and coordinate their work with the work performed by "Others".

1.4 GENERAL INFORMATION

1.4.1 Project Documents

- a) The BHS minimum requirements for this Project are provided in the Contract Drawings, Documents, and Specifications.
- b) The contract documents, drawings and specifications for this Project are for "Intent and Purposes" and are not to be interpreted as being complete and completely accurate in every aspect. The BHS contractor shall not copy or distribute or disclose its contents without the written consent of the Owner (or OAR).
- c) These specifications are performance based standards for a complete, fully functioning, Baggage Handling System (BHS).
- d) The Owner or the Owner's Authorized Representative (OAR) does not guarantee the accuracy of the documentation for the status of the Airport facilities, the utility services, existing conditions, clearances and/or structural information.
- e) The BHS contractor shall adhere to the Contract Drawings, documents and specifications and shall not exploit any discrepancy, error or omission.
- f) If there are any discrepancies between these specifications, the Contract Drawings, and/or documents, the more stringent requirement shall apply. This includes discrepancies between the contract documents and any applicable Federal, State or Local codes and TSA "Planning Guidelines & Design Standards" (PGDS) (latest version v8).

1.4.2 Contractor Responsibilities

- a) The design and construction of the new BHS work is subject to the approval of the Airport Authority (Owner) and shall meet or exceed all TSA PGDS (latest version) requirements where applicable.
- b) The project shall be phased to prevent disruption of existing and new Airport operations.

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- c) The BHS contractor shall verify the dimensions and confirm quantities of the materials and equipment before the preparation and submittal of applicable drawings.
 - d) The BHS contractor shall be responsible for field verifying and confirming all the existing conditions (including Mechanical, Electrical, and Plumbing (MEP), architectural, structural and phasing) that shall impact the scope of work.
 - e) The BHS contractor shall coordinate the final BHS equipment locations with Mechanical, Electrical and Plumbing (MEP).
 - f) The BHS equipment shall be laid out before the installation (so that all other associated trades may install their equipment and components in the spaces available).
 - g) Provide coordination for the BHS equipment installation in a professional and efficient manner.
 - h) The submission of a bid for this work shall serve as the BHS contractor's certification that the systems and components comply with the Owners requirements.
 - i) The BHS contractor shall prepare (in written form) the functional description and integration documents, to be submitted and reviewed by the Owner, or the Owner's Authorized Representative (OAR).
 - j) The BHS contractor shall provide all the labor, materials and facilities, and shall execute all the tasks associated with this project, including design, engineering, and all related work for a complete operational BHS that is accepted, and approved by the Owner (or OAR).
 - k) All BHS equipment, parts or material provided by the BHS contractor to be equal to those specified are subject to approval by the Owner (or OAR), utilizing the RFI and RFS process.
 - l) The BHS contractor shall provide all the required notices, file all plans, pay all fees, and obtain all the permits and approvals (from the authorities having jurisdiction). All required fees and taxes (Federal, State, and Local) shall be included in the bid price.
 - m) The BHS contractor shall be responsible for all their employee security badges, as required by the Airport Authority. The Owner (or OAR) shall not provide escort services for any BHS employees on the Airline Ticket Offices (ATO) and Airport Operations Area (AOA) side of the facility.
 - n) The BHS contractor shall provide the temporary power and lighting required for the installation and testing of the BHS.
 - o) Refer to procurement documents, the bid form and other specification sections for the "Buy American" certifications and compliance requirements.

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- p) All the BHS contractor's employees shall be US citizens or legal permanent residents of the United States.

1.4.3 Compensation for Impacts

The BHS contractor shall not be entitled to any additional compensation or time, (unless the cause and impacts are attributable to parties other than the BHS contractor).

1.4.4 BHS Permits

- a) The General Construction Permit covering the BHS installation, if required, shall be provided "by others".
- b) All other applicable electrical permits, licenses, etc., shall be obtained and paid for by the BHS contractor.
- c) A copy of the permits and inspections shall be provided by the BHS contractor and shall be submitted to the Owner (or OAR).
- d) The BHS contractor shall not perform any associated work prior to posting an "executed and approved" copy of the permit in a visible location (at the site of the work), if applicable.
- e) The permit shall not give authority to violate or cancel the provisions of these standards and codes. The permit shall not be construed as an approval of any violation of the provisions of the Airport Construction and Fire Prevention Standards or Codes.
- f) The permit shall not prevent the Building Official or Fire Chief from thereafter requiring the correction of errors, or from preventing building operations being carried on, when in violation of the referenced Standards and Codes.
- g) The permit applicant shall comply with all the Federal, State and Local laws, statutes, orders and regulations as may be legally applicable to the work that shall be performed under the permit. The permit applicant shall protect the lives and health of the public and fully comply with all safety standards (required by the Federal, State and Local laws).

1.5 DEFINITIONS

1.5.1 General

- a) "As Built" shall mean everything associated with the Project has been field verified and documented.
- b) "Baggage Handling System" shall include but is not limited to the following:
 - 1. All components for a fully operational, Owner approved and accepted system.
 - 2. Interfaces

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3. Hardware
 4. Software and documentation
 5. Installation materials
 6. Installation
 7. Coordination
 8. Construction supervision
 9. Computers
 10. Peripheral devices
 11. MCPs
 12. PLCs and/or HMIs
 13. Fire/Security doors
 14. Controls
 15. Control hardware
 16. Control software
 17. Management and support services
- c) "Contractor" shall mean a firm or person or other such entity that may be contracted by the Owner (or OAR) for the purpose of managing the contract.
 - d) "Others" shall mean a firm or person, separate from the BHS contractor, who shall enter (or has entered) into a separate contract with the Owner (or OAR).
 - e) "Baggage Handling System contractor" (BHS contractor) shall oversee the firm or company responsible for the design, engineering, manufacture, integration, installation, programming, testing and commissioning of the conveyor systems and associated equipment.
 - f) "Control System" shall mean the equipment and methods of controlling all of the associated baggage conveyors, equipment and devices in the BHS.
 - g) "Specifications" shall mean the requirements for the work included in the contract and any revision of such specification thereafter.
 - h) "The Contract Drawings" shall mean the drawings referred to in these written specifications or the contract. The Owner may supply revisions of those drawings and other drawings to the BHS contractor for the purposes of the Contract.
 - i) "Contract" shall mean the written agreement between the Owner and the BHS contractor for the performance of the works, including all schedules, attachments, annexure and other documents incorporated into this Contract, as specified.

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- j) "Subsystem" shall mean a set of baggage conveyor segments and its related field elements (MCP, control stations, Photo-eyes, encoders, etc.), which is functional, geographical or control system subdivision, and a part of the whole system
 - k) "Site" shall mean the Project work area made available (or to be made available) to the BHS contractor by the Owner (or OAR), for the purpose of the Contract and/or Work.
 - l) "Temporary Work" shall mean any work that is required for the execution of the contract, but not forming part of the final work.
 - m) "The Works" shall mean the whole Project obligation shall be executed in accordance with the Contract, including variations, provided for by the Contract.
 - n) "Work" under the Contract shall mean any and all work that the BHS contractor is, (or may be), required to execute per the Contract, including variations, remedial work and temporary work.
 - o) "Completion" shall mean the stage of the execution of the work under the contract when all other associated things are completed, performed and accepted.
 - p) "Cold Back-up" - shall mean redundancy based on the removal of a failed primary component and replacement with a fully programmed component.
 - q) "Public Areas" – shall mean any area that the general public (passengers, visitors, tourists, etc.) has unrestricted access to.
 - r) In these Specifications and on the Contract Drawings and/or Documentation the following clarifications/definitions shall apply:
 - 1. Words indicating the singular include plural and words importing the plural include the singular.
 - 2. Words indicating persons include a partnership and a body corporate.
 - 3. Words indicating the masculine gender also include the feminine gender.

1.5.2 Abbreviations

- 1. ACS - Access Control System
- 2. AL – Alarm Line
- 3. ANSI - American National Standards Institute
- 4. AOA - Airport Operations Area
- 5. ATO - Airline Ticket Office
- 6. AWS – American Welding Society
- 7. BHS - Baggage Handling System
- 8. BHSC - Baggage Handling System Contractor

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9. BIS – Baggage Inspection Station
 10. BIT – Baggage Inspection Table
 11. BPH – Bags Per Hour
 12. BRP – Baggage Removal Point
 13. BSD – Bag Status Display
 14. BVS - Baggage Viewing Stations
 15. CB - Clear Bag
 16. CBIS - Checked Baggage Inspection System
 17. CBRA – Checked Baggage Resolution Area
 18. CCTV – Closed Circuit Television
 19. CEMA - Conveyor Equipment Manufacturers Association
 20. CHO – Charlottesville Albemarle Airport
 21. COR - Change Order Request
 22. CT - Computed Tomography
 23. DHS – Department of Homeland Security
 24. EDS - Explosive Detection System
 25. ETD - Explosive Trace Detection
 26. FAA - Federal Aviation Administration
 27. FAT - Factory Acceptance Test
 28. FF&E – Furniture, Fixtures, and Equipment
 29. FIDS – Flight Information Display System
 30. FIS – Federal Inspection Services
 31. FLA - Full Load Amperage
 32. FPM - Feet Per Minute
 33. GC - General Contractor
 34. GSE - Ground Service Equipment
 35. HMI - Human Machine Interface
 36. HVAC - Heating, Ventilating and Air Conditioning
 37. IATA - International Airline Transportation Association
 38. ID - Identification
 39. IEC - International Electromechanical Commission

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40. I/O - Input/Output
 41. ILDT – Integrated Local Design Team
 42. IQ - Image Quality
 43. IQT – Image Quality Test
 44. IQTK – Image Quality Test Kit
 45. IRD – Interface Requirements Document
 46. ISD – In-line Screening Device
 47. IT – Information Technology
 48. LAN - Local Area Network
 49. LEO – Law Enforcement Officer
 50. LOI – Letter Of Intent
 51. MCP - Motor Control Panel
 52. MDS – Maintenance Diagnostic System
 53. MEP - Mechanical, Electrical and Plumbing System
 54. MTBF - Mean Time Between Failures
 55. NEC - National Electrical Code
 56. NEMA - National Electrical Manufacturers’ Association
 57. NFPA - National Fire Protection Association
 58. NIC - Not In Contract
 59. NTP - Notice to Proceed
 60. OAR - Owner Assigned Representative
 61. O&M - Operations and Maintenance
 62. OEM - Original Equipment Manufacturer
 63. OIT - Operator Interface Terminal
 64. OOG - Out of Gauge
 65. OS - Oversized
 66. OSARP – On Screen Alarm Resolution (Protocol) or (Process)
 67. OSHA - Occupational Safety and Health Administration
 68. OSR - On-Screen Resolution
 69. OWNER – Airport Authority
 70. P/N - Part Number

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71. PAX - Passenger
 72. PDP - Power Distribution Point (Panel) (Pole)
 73. PE - Professional Engineer
 74. PEC - Photo Electric Cell
 75. PGDS - Planning Guidelines and Design Standards (latest version)
 76. PLC - Programmable Logic Controller (or Computer)
 77. PM - Program (Project) Manager
 78. PT – Power Turn
 79. QA - Quality Assurance
 80. QAR - Quality Assurance Report
 81. RFI -Request For Information
 82. RFS -Request For Substitution
 83. ROM – Rough Order of Magnitude
 84. ROW - Right of Way
 85. SACR – Security Access Card Reader
 86. SAT - Site Acceptance Testing
 87. SB - Suspect Bag
 88. SF – Security Feed conveyor line
 89. SIDA – Security Identification Display Area
 90. SOP – Standard Operating Procedures
 91. SS – Security Shunt conveyor line
 92. SSI – Sensitive Security Information
 93. SVS – Secondary Viewing Station
 94. SWS – Search Work Station
 95. TBD – To Be Determined
 96. TCU - Threat Containment Unit
 97. TEFC – Totally Enclosed Fan Cooled
 98. TIM – Technical Interface Meeting
 99. TIR – Total Indicator Runout
 100. TOB - Top of Belt
 101. TR – Transfer Conveyor Line

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102. TSA - Transportation Security Administration
 103. UHMW – Ultra High Molecular Weight
 104. UL - Underwriters Laboratories
 105. UPS - Uninterrupted Power Supply
 106. VFD - Variable Frequency Drive

1.6 BHS CODES AND STANDARDS

1.6.1 Reference Codes

- a) The design and subsequent installation shall provide adequate safety factors and shall conform to all current standards and codes of the USA, State, City and Airport (whichever is more stringent).
- b) Reference to the codes and standards form part of this specification to the same extent as if bound herein.
- c) All work shall be in accordance with the latest applicable federal, state and municipal building codes.
 1. State Building Code
 2. National Electrical Code (NEC)
 3. International Fuel Gas Code (IFGC)
 4. ICC-2003 / ANSI - A117.1
 5. International Energy Conservation Code (IECC) - ASHRAE
 6. National Fire Alarm Code (NFPA 72-02)
 7. Sprinkler Systems (NFPA 13-02)
 8. International Fire Code (IFC)

1.6.2 Reference Standards

1.6.2.1 American Gear Manufacturer's Association (AGMA) www.agma.org

- a) AGMA 6009-A00, Standard for Gear Motor and Shaft Mounted Conveyor Drives.
- b) AGMA 6035-A02, Practice for Enclosed Cylindrical Worm Gear Speed Reducers and Gear Motors.

1.6.2.2 American National Standards Institute (ANSI) www.ansi.org

- c) ANSI A14.3, Fixed Ladders
- d) ANSI A1264.1, Safety Requirements for Workplace Floor and Wall Openings, Stairs

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- e) ANSI B20.1, Safety Standards for Conveyors and Related Equipment
 - f) ANSI B29.10M, Precision Power Transmission Roller Chains and Attachments
 - g) ANSI B29.3, Double Pitch Power Transmission Chains and Sprockets
 - h) Z535.1, Standard Safety Color Code
- 1.6.2.3 American Society of Testing Materials (ASTM) www.astm.org
- a) ASTM A36, Standard Specification for Carbon Structural Steel
 - b) ASTM A167, Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet and Strip
 - c) ASTM A307, Standard Specification for Carbon Steel Bolts and Studs
 - d) ASTM A325, Type 1 High Strength Structural Bolts
 - e) ASTM A569, Specifications for Steel, Carbon (0.15 Max Percent), Hot-Rolled Sheet and Strip
 - f) ASTM A1011, Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low Alloy and High-Strength Low Alloy with Improved Formability
 - g) ASTM D378-00, Standard Test Methods for Rubber (Elastomeric) Belting, Flat Type
- 1.6.2.4 ASME B20.1–2012, Safety Standards for Conveyors and Related Equipment.
- 1.6.2.5 American Welding Society (AWS) www.aws.org
- a) AWS A5.1, Specifications for Carbon Steel Electrodes for Shielded Metal Arc Welding
 - b) AWS C1.1M, Recommended Practices for Resistance Welding
 - c) AWS C1.4M, Specification for Resistance Welding of Carbon and Low-Alloy Steels
 - d) AWS C1.5, Specifications for the Qualifications of Resistance Welding Technician
 - e) AWS D1.1, Structural Welding Code Steel
- 1.6.2.6 Conveyor Equipment Manufacturers Association (CEMA) www.cemanet.org
- a) CEMA 401, Roller Conveyors – Non-Powered
 - b) CEMA 402, Belt Conveyors
 - c) CEMA B105, Specifications for Welded Steel Conveyor Pulleys with Compression Type Hubs
- 1.6.2.7 National Electric Manufacturers Association (NEMA) www.nema.org

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- a) ICS 1, Industrial Controls and Systems
 - b) MG 1, Motors and Generators

1.6.2.8 National Fire Protection Association (NFPA) www.nfpa.org

- a) NFPA 70, National Electrical Code (NEC)
- b) NFPA 79, Electrical Standards for Industrial Machinery
- c) NFPA 80, Standards for Fire Doors, Fire Windows

1.6.2.9 Occupational Safety and Health Administration (OSHA) www.osha.org

- a) 29 CFR Part 1910, Occupational Safety and Health Standards
- b) 29 CFR Part 1926, Safety and Health Regulations for Construction

1.6.2.10 Underwriters Laboratory (UL) www.ul.com

- a) UL 62, Safety Standard for Flexible Cord and Fixture Wire
- b) UL 845, Motor Control Centers
- c) UL 508, Industrial Controls Equipment
- d) UL 508A, Industrial Control Panels
- e) UL 61800-5-1, Adjustable Speed Electrical Power Drive Systems
- f) UL 1998, Safety Software in Programming Components

1.6.2.11 International Electromechanical Commission (IEC) 61508
<http://www.61508.org> Functional Safety of Electrical/
Electronic/Programmable Electronic Safety-related Systems

1.6.3 Applicable Codes

- a) All electrical equipment and materials provided for the BHS shall conform to applicable standards of the National Electrical Manufacturers Association (NEMA).
- b) All components provided for the BHS shall be designed for continuous duty service.
- c) Applicable requirements of OSHA, ANSI Conveyor Safety Code B20.1 and the National Electrical Code (latest edition) shall be met, as well as those of any other governmental or local authority having jurisdiction.

1.7 BHS SCOPE OF WORK

1.7.1 BHS General Scope

- a) The BHS contractor shall provide the design, engineering, programming, fabrication, transportation to and from the site, installation, temporary BHS conditions (e.g., Interim Conveyor Control Functionality, as required to maintain operations), removal, demolition, modifications, testing and turning over in

working order; the BHS portion of the Project scope described herein, in compliance with these written specifications and the accompanying drawings.

- b) The BHS contractor shall provide complete, operable, maintainable and safe systems on a "turnkey basis", including electrical power to all BHS related equipment and/or components from the existing sources indicated on the accompanying drawings (i.e., from BHS MCPs to associated BHS field components), motors, motor starters, disconnects, controls, pushbuttons, conduit, wiring, (any required modifications to existing controls), fault diagnostics and associated reporting functionality, catwalks, ladders, baggage makeup device crossovers (including Control Stop/Start control stations) and all other necessary BHS components and/or devices, whether specifically shown and described, or implied in the plans and specifications or wherever is required to effectively accomplish the intended functions of the BHS project, as well as any necessary modifications to the existing power sources, PLCs.
- c) The BHS contractor shall design all parts and sub-assemblies in accordance with good industrial practice and assure safe, efficient and practical design in-keeping with requirements particular to this type of system. All BHS equipment shall be in imperial sizes and dimensions.
- d) Sprinkler system lines and/or other MEP equipment shall not be supported by any BHS equipment or its supporting structure (i.e., BHS overhead and/or floor supports). The coordination shall ensure the required interface between the BHS equipment and the adjoining architectural building elements.
- e) Submit to the Owner (or OAR) any request for information, clarification of the specification, and variance from the specifications as a Request for Information (RFI).
- f) The price shall be full compensation for furnishing all labor, equipment, and materials necessary to provide the BHS in place and ready for "Beneficial Use".

1.7.2 General

- a) The extent of the "phased work" shown on the Contract Drawings, comprised in part by design criteria drawings and as specified herein, is defined to include but not limited to: Labor, Materials, Equipment, Supervision, Design and Fabrication, Installation and Testing.
- b) The BHS contractor shall perform modifications as necessary to meet requirements of the Contract Documents, and to coordinate the work subject to acceptance by the Owner (or OAR). Maintain design concept without altering profiles and alignments, unless documented written acceptance and approval is received from the Owner (or OAR).
- c) Variations in details and materials shall not adversely affect appearance, durability, strength and performance of the system. Provide complete drawings and data of any proposed modifications.

1.7.3 BHS System Elements

- a) The BHS contractor shall furnish and install all necessary equipment to provide a complete, operable and maintainable system including but not limited to:
 1. Conveyor bed sections
 2. Drives
 3. Take-ups
 4. Side guards
 5. Shrouding
 6. Floor supports
 7. Ceiling hangers and headers
 8. Stainless steel panels and conveyor trim
 9. Fire/security doors
 10. Draft curtains
 11. Catwalks, Platforms and Access ladders
 12. Guard rails
 13. Motor Control Panels
 14. Conduit and wiring
 15. All controls including interface with all baggage-related equipment and screening equipment.
 16. Any other materials or equipment required to provide a complete, operable and maintainable system in complete compliance with this specification.

1.7.4 Existing Conveyors

1.7.4.1 General

- a) BHS contractor shall perform a complete evaluation of all the existing BHS conveyors and the associated power and controls scheduled for demolition and notify the Owner (or OAR) of any potential complications with the modifications and/or removal of any existing systems and/or associated equipment.

1.7.4.2 Temporary Systems

- a) BHS contractor shall provide all required temporary conveyors, power and equipment necessary to minimize operational impacts to the Owner (or OAR) and/or Airlines.
- b) The extent of operational impacts shall be coordinated and approved by the Owner (or OAR).

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- c) Current BHS drawings shall be maintained and located on-site, throughout the system upgrades and/or modifications.

1.7.4.3 Demolition of Existing Systems

- a) BHS contractor shall demolish (demo) all existing conveyors required for this project, including all associated equipment. Demo temporary conveyors and all associated equipment. Demo items typically include, but are not limited to, those listed below:
 - 1. Conveyor bed sections
 - 2. Drives
 - 3. Take-ups
 - 4. Side guards and shrouding
 - 5. Floor supports
 - 6. Ceiling hangers and headers
 - 7. Stainless steel panels and conveyor trim
 - 8. Fire/security doors and draft curtains
 - 9. Catwalks, platforms and access ladders
 - 10. Guard rails
 - 11. Control panels
 - 12. Conduit and wiring
 - 13. All corresponding controls and devices (back to source / MCP)
- b) The owner shall have the right to salvage and retain any demoed equipment. Coordinate with the Owner (or OAR) to review and determine what equipment shall be salvaged and what shall be disposed. The contractor shall assume a 48 hour window to allow the airport to denote and retain the salvaged components prior to disposal.
- c) The Owner (or OAR) shall have first right of refusal on all existing conveyor equipment to be removed. Any conveyor equipment remaining shall become property of the BHS contractor and shall be removed from the site in a timely manner.
- d) At no time shall conveyor equipment remain on site after removal in excess of 48 hours, without written approval from the Owner (or OAR).

1.7.5 BHS Work Provided

- a) The BHS work provided under this specification section shall include but is not limited to:
 - 1. Permits

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2. Supervision
 3. All associated labor
 4. Tools and equipment
 5. Materials
 6. Design and programming
 7. System integration
 8. Testing and Commissioning
 9. Inspection and/or re-inspection fees
 10. Transportation
 11. Security badging
 12. Insurance
 13. Temporary protection
 14. Temporary lighting
 15. Temporary conveyors and controls
 16. Phased construction
 17. Testing and Owner (or OAR) acceptance.

1.7.6 Incidental Items Provided

- a) Provide all incidental items that are required for BHS installation and operation of all the systems, as specified in the Contract documents, and for temporary construction to maintain existing Airport operations, (including porting of baggage, as required). The BHS contractor shall provide and install the following:
 1. Warning devices
 2. Safety signage and Lights
 3. Platforms and Partitions
 4. Barriers, Bollards and Guard rails
 5. Supports and anchors
 6. Stanchions and Mounting brackets
 7. Framing and trim
 8. Ladders, Stairs and Crossovers
 9. All other items required for protection of personnel and equipment in the area of the work.

1.7.7 Provide Turnkey System

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- a) The BHS contractor shall provide "Turnkey Systems" that are complete, operable, maintainable and safe. This shall include:
 1. Electrical power to the BHS (from power distribution points)
 2. Motors and Motor Safety Disconnects
 3. Cabinets and junction boxes
 4. Conduits and wiring
 5. Control stations and control devices
 6. Limit switches and/or photo-eyes
 7. Shaft Mounted Encoders
 8. Fire/Security Doors
 9. All other required components, whether specifically shown or implied in the plans and specifications.
 10. Programming and integration into current control systems.
 11. Testing and Commissioning.

1.7.8 Pre-Bid Meeting

In the event that the Owner conducts a pre-bid meeting, which may include a site walkthrough of the area specified for the BHS work, the BHS contractor shall coordinate this pre-bid walk-through with the Owner (or OAR). It is highly recommended that the BHS contractor has the appropriate technical staff attend the on-site pre-bid meeting and participate in the site walkthrough to get thoroughly acquainted with the overall scope of work and installation restrictions directly associated with the existing areas of the facility.

Ensure that the appropriate BHS technical personnel attend the pre-bid site visit to review and survey the following project related requirements that are associated with the existing BHS including modifications to the existing baggage handling control systems required to support phasing.

- a) Perform a complete mechanical and electrical field survey of the existing BHS. Identify all building interface requirements necessary to install the new and/or modified BHS as shown on the Contract Drawings. Verify as-built conditions and notify the Owner (or OAR) of any conflicts.
- b) Take into account in the bid proposal the effect that any adjacent construction, operations and maintenance works may have on the BHS installation, testing and commissioning. Ascertain and allow in the bid proposal for all necessary precautions and for any difficulties that may arise in the execution of this BHS project. No claims arising out of the site constraints, difficulties of access,

temporary services and facilities or labor shall be acknowledged by the Owner (or OAR).

- c) Coordinate with all necessary BHS contractor disciplines on site and with the Owner (or OAR), the overall Project Implementation Schedule, the modified area layout, drive aisles, cart staging lanes and Airline's operational schedules, to avoid any conflicts.

1.7.9 General Scope Overview

The BHS contractor shall provide all labor, materials, and equipment required for implementing the BHS portion of the Project Scope as defined by the associated drawings and specifications, all of which shall include, but not limited to the following:

- a) Installation of required conveyor segments and associated equipment, as illustrated in the accompanying drawings.
- b) Modifications to existing BHS and associated controls with all required interfaces between any existing and new conveyor segments and/or equipment and related components.
- c) Demonstrations for the Owner's (or OAR's) acceptance inspections and testing (including required support and participation).
- d) Temporary reinforcement of conveyor sections (with associated conduits, control stations and related BHS field devices), as needed to clear the right-of-way for upcoming installations.
- e) Necessary wiring between BHS and equipment and/or components provided by others.
- f) Necessary protection of conveyor equipment that is under construction.
- g) Modifications, demolition and/or removal, including all required materials, and Field Verification
- h) The Contract Drawings and Documentation are intended to generally outline the conveyor system configuration and function desired. Pertinent building dimensions are noted along with specified conveyor dimensions and elevations. Conveyor length and right-of-ways are presented as approximations that must be determined by as-built of building construction drawings, verified against actual field measurements taken by the BHS contractor. The BHS contractor shall field measure actual conditions and dimensions, prior to preparing shop and installation drawings.
- i) Determine the source of control power and coordinate it with the Owner (or OAR). The number, size and locations of the BHS Motor Control Panels/Centers (MCP/MCCs) are presented as approximations and shall also be field verified. Verify the final number of panels, with related cabinet sizes and locations based

on the preparation of applicable electrical shop drawings and submit the System MCP sizes and related power requirements in accordance with the Schedule of Submissions.

1.7.10 Permits and Inspections

- a) The BHS contractor shall obtain and pay for all permits, inspection fees, and certificates relative to all phases of BHS construction, and shall be responsible for all associated employee badges and fees as required by the Airport Authority for this project. The Owner (or OAR) shall not provide escort services to any of the restricted Airside Operations Areas (AOA) and/or Security Identification Display Areas (SIDA). Take on responsibility for all aspects of Airport security as it pertains to the BHS work and employees in all AOA/SIDA areas.
- b) Submit all BHS drawings, structural attachment details, with associated computations, and point load drawings, "signed and sealed" by a registered Professional Engineer (PE) licensed in the jurisdiction where this Project is located. The PE shall review, verify and certify the design and installation of the BHS equipment structural systems and associated attachments to the building structure, which shall include all necessary temporary and final works.
- c) Provide the Owner's Inspection Engineer unrestricted access to the Work for the required Special Inspections of all BHS related support attachments to the building structure and the review and approval of the BHS contractor's PE signed and sealed structural attachment documents and point loading diagrams as they relate to the actual onsite installation. These special inspections of BHS related structural members shall be performed in compliance with the International Building Code. These services shall be performed at no additional cost to the Project.

1.7.11 Structural Considerations

- a) The structural requirements of this Project are critical, given the structural design of the Airport. All components that require overhead support shall utilize structural steel, which shall be supported off the existing building joists. No attachment to the upper level deck (slab) shall be allowed. The Structural Attachment submission to the Owner (or OAR) shall be carefully scrutinized and evaluated.
- b) Where required, provide all temporary and final conveyor equipment, components and support structures for the BHS, including columns, beams and header steel. Coordinate the proposed BHS support system with the Owner (or OAR), as well as the overall Project implementation schedules, and Airlines operational schedules.
- c) All temporary and final conveyor equipment supports shall be designed and installed so as not to infringe on the Airport structure and/or facilities, and the Airline Operational Areas (AOA), drive aisles and cart staging areas.

1.7.12 Protection of Equipment

- a) Coordinate and adequately protect the conveyor equipment from the Mechanical, Electrical and Plumbing (MEP) installations and/or modifications.
- b) Ensure that adequate protection is provided around the associated conveyor segments (new, existing and/or modified) wherever the Facility and Utility modifications are occurring. Ensure that the construction around the conveyors and the protection provided around the conveyor segments allows for the uninterrupted and continued operation of the baggage handling systems.

1.7.13 Testing and Commissioning

- a) The Contractor shall perform all required contractor and owner test demonstrations for specification conformance acceptance as defined in this specification and documented on the contractor prepared, approved, test plans.
- b) Provide all supervision, technical, labor, materials, and equipment required for commissioning defined by these specifications.
- c) Prior to the start of the Owners Acceptance Testing perform all "debugging" and internal testing and carry out a "dry test run" of all Acceptance Tests prior to conducting such tests with the Owner (or OAR) to ensure that tests conducted with the Owner (or OAR) are successful. These tests must be completed, and necessary documentation submitted for review prior to moving to the next phase of testing required. Time for review of the submitted documents shall be allotted within the contractor's schedule.
- d) Make available to the Owner (or OAR) on a daily basis any and all records of internal BHS testing and debugging (with corrective action) performed prior to Acceptance Testing.
- e) Upon completion of the BHS Project, (all related programming and internal testing and/or debugging is complete), demonstrate the system's operating capability to the Owner (or OAR) for acceptance and to confirm compliance with the specified requirements.

1.7.14 Site Project Management and Technical Support

- a) A BHS contractor site supervisor or project manager (direct employee) shall be on-site during every stage of construction and installation. At no time will subcontractors be doing work on-site without such supervision.
- b) The appropriate technical (mechanical, electrical, PLC or software) staff shall be on-site during installation, testing and live bag commissioning. Technical staff shall be on-site for the Conditional Acceptance Operational Period for the BHS after going live. Subsystems shall require technical staff to be on-site for the 40 hour run-in period, at minimum, unless otherwise authorized by the owner.

1.7.15 Meetings and Scheduling

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- a) The BHS contractor shall provide appropriate personnel for attending the coordination meetings, as required by the Owner (or OAR). The BHS contractor shall coordinate the meetings with the General Contractor (GC) and follow the GC's schedule.
 - b) The BHS contractor shall anticipate a minimum of two (2) pre-installation meetings with the Owner (or OAR) to review all the exact interface and integration details for the Project. These meetings shall be scheduled within 21 days of the issuance of the Notice to Proceed.

1.7.16 Schedule Management

- a) The General contractor or BHS contractor shall submit for Owner (or OAR) approval and maintain a critical path schedule of all major activities, dependencies between task activities, milestones, and phases required to demonstrate the successful completion.
 - 1. The BHS schedule shall be developed and maintained using Microsoft Project (current version).
 - 2. Schedule days shall be defined as "Standard Work Day" and "Standard Work Week", using calendar days.
 - 3. The schedule shall include review times by the Owner (or OAR) for submittals, and allow time for re-submission (if required), prior to fabrication.
 - 4. Baseline schedules shall be updated at least monthly to coincide with the date of the reporting period, or as otherwise required by personnel tasking.
 - 5. A separate submittal log and listing of all submittals shall be provided with project schedules and updated each week.
 - 6. Submit implementation schedules and associated phasing and sequencing plan documentation with any required operating and maintenance documentation to the Owner (or OAR), including but not limited to required manuals, equipment parts lists and approved design drawings.
- b) Special consideration shall be made for TSA deliverables and milestones. These are important to the planning and shall be coordinated with the TSA to ensure that the components are installed when needed so as to not negatively impact the project schedule. This coordination effort is the responsibility of the BHS contractor. Similarly, all testing and certifications to be performed by the contractor in conjunction with the TSA or its independent contractors shall be shown on the schedule with appropriate durations as specified in PGDS or as coordinated with the TSA Site Lead.

1.7.17 Auxiliary Labor

Provide all associated labor and test material as specified elsewhere in this document, including service technicians and test material handlers for the BHS Acceptance Testing. These test demonstrations shall be carried out, as part of the

base contract, per the BHS Test Plans that shall be prepared by the BHS contractor, in compliance with the requirements of this specification.

1.8 PROJECT CONDITIONS

1.8.1 General

- a) The Owner (or OAR) does not guarantee the accuracy or the completeness of the information relating to the new and/or existing Baggage Handling Systems, utility services, facilities, or structures that may be shown on the drawings or encountered in the work. Any inaccuracy or omission in such information shall not relieve the BHS contractor's responsibility to protect such existing features from damage or unscheduled interruption of operations and services.
- b) It is noted that airport is currently a fully functional facility and shall remain in operations for the entire duration of the Project. The BHS contractor is required to closely follow the outlined phasing plans and coordinate all activities with the Owner (or OAR), so as not to cause any undue disruptions to the Airport and/or Airline operations.
- c) Coordinate all building modifications performed by any associated trade to accommodate the phased installation of the BHS.

1.8.2 Temporary Conditions

- a) The BHS contractor shall need to consider the availability of temporary access, temporary lighting and power, telephone services, internet services, storage facilities, water supply, waste disposal facilities, labor supply, weather conditions, parking of vehicles, loading and unloading of materials, and equipment laydown area conditions.
- b) During demolition phases the dumpster locations, delivery times, and pickup times are to be coordinated with the Owner. During installation phases equipment delivery times and laydown areas are also to be coordinated with the owner. Some areas may only be available between midnight and 8 am.
- c) Provide all temporary power and lighting that may be required for and during the course of the temporary conditions, overall installation and testing of the BHS, in compliance with the specifications.

1.8.3 Required Notice

Prior to commencing the work in the general vicinity of an existing baggage conveyor system, utility service or facility (i.e., a subsystem that has been previously turned over for operational use by the BHS contractor or an existing subsystem that is in operational use), the BHS contractor shall notify the Owner (or OAR) in advance, (per the supplementary conditions for system outage and/or interruption) and obtain approval before proceeding with the work. Failure to give the required notice shall be cause for the Owner (or OAR) to suspend the

BHS contractor's operations in the general vicinity of the system, utility service or facility.

1.8.4 Damage or Interruption

Should damage or unscheduled interruption of Airline operations, utility service or Airline facility occur by accident or otherwise, the BHS contractor shall notify the Owner (or OAR) and take all reasonable measures to prevent further damage or interruption of service. In such events, cooperate with the utility service, and the Owner (or OAR) until such damage has been repaired and service restored to the complete satisfaction of the Owner (or OAR) and the utility service, at no cost to the Owner.

1.8.5 Installation Conditions

The BHS shall be installed within the existing Airport Facility, working simultaneously with other trades. The existing conveyor systems and associated equipment is currently in use on a consistent basis by User Airlines.

1.8.6 Phased Implementation

Comply with the Phased Implementation general requirements and outlined phasing summary specified in the drawing package, in compliance with the overall Project schedule, and applicable requirements.

1.8.7 Ramp Area Proximity

The portions of the construction and/or installation associated with this Project shall take place immediately adjacent to active Airline operations areas.

1.8.8 Lay-Down Area Restrictions

Lay-Down and shake out areas may be limited to the confines of the immediate building. All Lay-Down areas shall be designated and approved by the Owner (or OAR).

1.8.9 Restoration of Service Costs

The BHS contractor shall incur all restoration of service costs due to his/her negligent or accidental damage of any Airport utility service or facility. The Owner (or OAR) reserves the right to deduct such costs from any monies due, (or which may become due), to the BHS contractor.

1.8.10 Protection of Work

- a) The BHS contractor shall make explorations and probes as necessary to ascertain any required protective measures, before proceeding with installation, demolition and/or removal of any associated equipment. Particular attention shall be given for equipment supports and bracing requirements, (to prevent any damage to new and/or existing BHS equipment).

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- b) Provide, erect and maintain catch platforms, dust partitions, lights, barriers, warning signs and other items (as required) for proper protection of operating personnel, the public, occupants of building, workmen engaged in installation, removal and demolition operations, and adjacent construction. Comply with the requirements and restrictions of the Contract Drawings.
 - c) Do not store or place materials in passageways, stairs or other means of egress. Do not close or obstruct walkways, passageways, stairways, streets, walks, terminals, runways, right-of-ways, or other occupied or used facilities without written permission from the Owner (or OAR). Conduct all operations with minimum traffic interference.
 - d) Provide and maintain temporary protection of the existing BHS designated to remain where demolition, removal and/or new work is being done, connections being made, materials handled, or equipment moved. Protect unaltered portions of the existing system affected by the operations of the work, so that the normal activities conducted in such areas may continue with no interference.
 - e) Utilize suitable coverings to protect existing work. Be responsible for any damage to the existing BHS and facilities or other contents by reason of the insufficiency of protection provided. Promptly repair any damage caused to adjacent facilities and restore as new.
 - f) The BHS contractor shall repair any damage to work in place and notify the owner (or OAR). This shall include repair of both new and existing fireproofing materials, including fire-rated walls that were removed to allow the installation of BHS structural attachment supports, header steel and installation of conduits, junction boxes, etc.

1.9 SYSTEM PERFORMANCE REQUIREMENTS

1.9.1 Maximum Baggage Dimensions

- a) The BHS equipment shall be capable of conveying baggage of various shapes and sizes with dimensions not exceeding:
 - 1. 36 inches in height
 - 2. 30 inches in width
 - 3. 54 inches in length

1.9.2 System Reliability

Reliability requirements of the total BHS shall be measured in terms of "System Availability" (A_s).

1.9.2.1 Failure

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- a) A failure is defined as any malfunction of a BHS component, assembly, or subassembly which stops normal operations. A failure shall be charged against only the one subsystem, which causes that failure.
 - b) The following shall not be classified as failures:
 - 1. Malfunctions caused by a failure on the Owner's part (after system acceptance) to properly maintain and operate the BHS in accordance with approved procedures.
 - 2. Malfunctions due to causes outside the BHS such as general power outage, etc.
 - 3. Malfunctions due to baggage jams not caused by failure of a BHS component, assembly, or subassembly unless it is a defective part, a poor installation, or a failure of a component or subassembly to perform its intended function.
 - 4. Incipient failures, which are detected and repaired without affecting normal operation of the BHS.

1.9.2.2 Sub-System Availability (As)

- a) Sub-System Availability (As) shall be defined by the following equation:

$$As = (ST - RT) / ST$$

Where:

ST = Scheduled Operating Time: The scheduled time that the BHS is available for baggage processing (normally 18 hours per day).

RT = Repair Time: The interval of time between initiation of repairs due to a failure and return of the BHS to operation.

- b) A subsystem shall be defined by its conveyor subsystem identification or E-Stop zone, whichever is more stringent.
- c) Each subsystem of the BHS shall have an availability of not less than 0.99 (99%), to be calculated on a monthly basis.
- d) The maximum allowable downtime in a single operating day shall be no more than 15 minutes on one subsystem and an accumulative downtime for all subsystems not exceeding 30 minutes, on a monthly basis.
- e) Jams occurring due to improper loading do not count against the reliability.

1.9.3 Noise Level

- a) The BHS and associated equipment shall not increase the ambient noise level in public areas by more than 15 dbA.
- b) The bag room and all other associated non-public areas shall not exceed 75 dbA.

- c) The ambient noise levels for the BHS equipment shall not exceed OSHA standards.
- d) Noise levels shall be limited throughout the system to the following criteria:

	TSA/Public Area	Equipment Area
Maximum	65 dbA	70 dbA

- e) Noise measurements shall be made under free field conditions according to DIN 45635/OSI 3744, average three feet from drive sections.
- f) The dbA values does not include the noise due to baggage.
- g) Noise levels shall be measured with an A-weighted sound level meter (or 1/3 band octave analyzer) and converted to sound power levels.
- h) Areas of measurement shall be at Owner’s (or OAR’s) discretion.

1.9.4 BHS Radio Frequency Interference:

- a) If the BHS causes the radio interference to be above the Airport acceptable level, suitable filtering and suppression shall be provided and installed by the BHS contractor.
- b) The equipment provided shall not cause interference with communications within the Airport, or between the Airport and aircraft or ground vehicles.
- c) All electrical and electronic equipment, including interconnecting wires and cables, shall be designed to operate without malfunction in the presence of normal “electromagnetic emissions” generated by other equipment installed and/or used at the Airport.
- d) The normal Airport environment includes the aircraft communications bands and high power “radar systems”. The environment shall include various electrical motors and controls, power tools, welders, automotive vehicles, etc.

1.10 BHS QUALITY ASSURANCE

1.10.1 BHS Contractor Qualifications

- a) Authenticate a minimum of five (5) years of demonstrable experience as a “Turnkey” BHS contractor for automated baggage handling systems with at least four (4) projects where the completion of a minimum project value of \$3,000,000 (per project) RFI Request for Information
- a) RFI shall be submitted when there is a discrepancy or concern discovered by the contractor. These shall be submitted for review with pertinent information related to the concern and may include specification reference, drawing reference, photographs, meeting minutes and a required answer date. Any potential impacts to schedule or cost shall also be noted for consideration.

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- b) The BHS contractor shall be responsible for the Airport Authority's administrative costs for answering Requests for Information (RFI)'s that could reasonably be found by reviewing the Contract Documents or are solely for the convenience of the BHS contractor. These costs may be deducted from BHS progress payments.

1.10.2 RFS Request for Substitution

- a) The contractor shall adhere to the Request for Substitution processes and documentation requirements as defined in the Division 1 specifications.
- b) The use of any alternate equipment, or substitutions of components and/or materials, (other than those alternates specifically listed or detailed out and identified within the specification) shall not be acceptable without the written approval of the Owner (or OAR).
- c) If the BHS contractor proposes to use any articles, devices or materials that he believes are equal in quality, finish and durability and are equally suitable for the purpose intended as the particular articles, devices, or materials specified, the BHS contractor shall submit a "Request for Substitution" (RFS) for each item to the Owner (or OAR) in writing for approval. The RFS shall include all relevant specifications, cut sheets, test results, references, and identify where the item is currently in use.
- d) The articles, devices and materials specified shall not be changed except with the written consent of the Owner (or OAR). The BHS contractor shall not contract, purchase, or cause to be delivered any substitute articles, devices, or materials prior to obtaining such written approval from the Owner (or OAR).
- e) Equivalent products of any manufacturer that are not listed in the specifications as "Acceptable Manufacturers" are subject to the submittal requirements (per the substitution procedures).
- f) The Owner (or OAR) may request additional or more detailed information or documentation from the BHS contractor for evaluation, within fourteen (14) calendar days of receipt of the submittal.
- g) Substitutions that are requested during the bidding phase and accepted by "Modification of the Bid" (and clarified by BHS contractor's written addendum) shall not be subject to the requirements specified in this section.
- h) Any requests for substitutions shall be submitted prior to the date of bid closing and formatted (as outlined) in the substitution procedures. The BHS contractor shall be responsible for all additional costs incurred as a result of any re-design to accommodate "approved equal" items.
- i) Any changes in equipment, components, materials, products or methods of construction (after the contract is awarded) shall be construed as "substitutions", and must be pre-approved by the Owner (or OAR)

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- j) Substitutions shall not be considered if they are only identified on the drawings or product data sheets, (without a separate formal request). Approval of drawings shall not constitute approval of any substitutions proposed. Product data or samples for construction that do not comply with the Contract Documents shall not constitute acceptable or valid requests for substitution.

1.10.3 Non-Compliance of Substitutions and Design Deviations

- a) If at any time the approved substitution or deviation does not perform to the standards and publications submitted for the item in question, the BHS contractor shall bear the responsibility of the replacement, and/or any associated costs with the implementation of the replacement of the item as originally designed, per this specification.
- b) The BHS contractor shall also be responsible for any liquidated damages that may occur due to scheduling delays associated with the substitution or deviation.

1.10.4 Design Deviations

- a) If the BHS contractor desires to deviate from the design, the BHS contractor shall submit a "Request for Deviation" for each item to the Owner (or OAR) in writing for approval
- b) The Request for Deviation shall include all information relevant to the reason for the deviation to the design. The proposed changes to the design as specified shall not be changed except with the written consent of the Owner (or OAR).
- c) The BHS contractor shall not contract, purchase, or cause to be delivered any substitute articles, devices, or materials relating to the deviation to the design prior to obtaining such written approval from the Owner (or OAR).

1.10.5 Discrepancy Notifications

The BHS contractor shall field verify (prior to design and fabrication) all measurements, dimensions, elevations and quantities. Any discrepancy that is found shall be submitted to the Owner (or OAR) for consideration before proceeding with the work, no later than five (5) calendar days after the discrepancy discovery.

1.10.6 Quality Assurance Resolutions

- a) The Airport Inspector, or OAR, shall perform the Quality Assurance (QA) inspections of the baggage systems during the conveyor installation.
- b) Any discrepancies that are found shall be logged in a QA "Open Issues" Log. All Items logged in the QA "Open Issues" Log shall be brought to the attention of the BHS contractor for discussion.
- c) A reasonable resolution date for each of the items on the log shall be agreed upon, with the BHS contractor. If the discrepancy is not corrected within the accepted time frame, the unresolved item shall then be assigned a Quality Assurance Report (QAR).

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- d) When the QAR is generated, the BHS contractor has 24 hours to correct the discrepancy. If the discrepancy is not addressed (and corrected) within 24 hours of the QAR, a letter of non-compliance shall be issued to the BHS contractor. The letter of non-compliance shall state:
 1. The issues
 2. Date and time that the issues were discovered
 3. The BHS specification reference to the issues
 4. The monetary value to correct the issues for which the BHS contractor shall be responsible.
 - e) Any discrepancies that are found during QA inspections that are determined by the Airport QA inspector, or the Owner's designated representative (or any associated safety inspector) to be a safety or operations issue shall be issued as a QAR to the BHS contractor.

1.10.7 Standards

- a) The BHS integration contractor shall document and provide a minimum of three (3) years of successful experience designing, programming, installing, integrating, and commissioning at least four (4) control systems of equivalent size and complexity.
- b) The BHS contractor shall develop, utilize, and maintain a documented Quality Assurance system. The BHS contractor shall forward the appropriate contract requirements to their sub-contractors and suppliers to ensure compliance with the contract.
- c) The BHS contractor shall provide a designated Representative as a "point of contact" for all communication on quality-related issues. The quality representative shall be responsible for accomplishment of all associated quality assurance tasks.
- d) The BHS equipment that is covered by these specifications shall be designed, assembled and tested in accordance with the latest applicable standards of the following:
 1. American National Standards Institute (ANSI) www.ansi.org
 2. National Electrical Manufacturers Association (NEMA) www.nema.org
 3. Institute of Electrical and Electronic Engineers (IEEE) www.ieee.org
 4. Conveyor Equipment Manufacturer's Association (CEMA) www.cemanet.org
 5. Underwriters Laboratories (UL) www.ul.com
 6. National Fire Protection Association (NFPA) www.nfpa.org

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- e) All the BHS electrical work shall be done in accordance with the latest applicable municipal electrical codes and the latest version of the N.E.C., (whichever is more stringent).
 - f) All BHS components shall be new and "UL" labeled (where such approval is granted to the equipment to be furnished). www.ul.com
 - g) All associated equipment shall adhere to the most recently published applicable federal specifications and applicable OSHA specifications. www.osha.org
 - h) BHS fasteners shall be stainless steel (public areas), cadmium plated, or zinc plated, and locked with lock washers or lock nuts.
 - i) BHS stainless steel trim shall be AISC type 304, #4 Brush Finish www.aisc.org
 - j) BHS structural steel shall be ASTM A-36 www.astm.org

1.10.8 Workmanship

- a) The BHS contractor shall use the latest and best trade methods throughout the BHS. Professional workmanship shall be executed in accordance with the best commercial practices consistent with "heavy duty" Airport applications. Equipment shall be designed to meet the requirements of Airline baggage handling systems.
 - 1. The BHS contractor shall correct or replace any work that has substandard workmanship (at no additional cost to the Owner).
 - 2. All equipment, materials and components furnished shall be new and free from defects. Used equipment, (whether reconditioned or refurbished), shall not be acceptable.
 - 3. All associated equipment shall be the current version of the manufacturer at time of "Notice to Proceed" (NTP). When any product has available factory upgrades or modifications, such upgrades and modifications shall be fully implemented at the factory (and receive full factory testing and certification). Field installed equipment upgrades and modifications shall not be conducted without written approval of the Owner (or OAR).
 - 4. All projections, welds, and transfer points between conveyors shall be smooth to eliminate damage to various types of bundles, handbags, suitcases, and trunks. Bottom glides on cases, strings, tags, straps, bag handles, destination tags, etc. shall be protected against damage from conveyor side guards, transfer points and all other surfaces against which baggage may come into contact during baggage handling.

1.10.9 Welding

- a) All BHS welding shall comply with the current applicable AWS and ASTM standards. www.aws.org www.astm.org

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1. Areas to be welded shall be free from rust, grease or other foreign matter for a distance of at least 1/2 inch back from the edge of the weld. Make all fillet welds a minimum of 1/8 inch, unless otherwise noted on the drawings.
 2. Repair all pinholes, cracks and other defects by chipping and grinding out the defects and re-welding.
 3. After the welds are made, clean them of slag and spatter to show uniform sections, smoothness of metal, feathered edges (without overlap or undercut).
 4. Visual inspection at the edges and ends of the welds shall indicate good fusion with the base metal.

1.10.10 Alternative Materials/Standardization

- a) No alternative materials may be utilized in the BHS without prior approval of the Owner (or OAR).
- b) When multiple manufacturers are listed for a specific component within this specification, the BHS contractor shall use one specified manufacturer for a specific component.
- c) BHS contract shall submit an RFS for any alternative material.

1.11 BID PROPOSAL

1.11.1 Proposal General

- a) The BHS contractor is expected to have thoroughly reviewed the BHS design and requirements (presented in the specifications, documents and drawings) and accepted the design and requirements as being suitable and viable to safely accomplish the functions and processes described in the bid submission.
- b) The BHS contractor shall conduct a job-site review, (prior to submission of the bid proposal), to become familiar with all job-site conditions that may impact the proposal.
- c) The BHS contractor shall identify any design aspect or specification requirement that is believed to be unsuitable or inadequate, (along with an associated cost to remedy, provided as an alternative).
- d) The BHS contractor shall provide (in the bid submittal) the pricing for the "base systems" that are presented in the corresponding drawings and specifications.
- e) In the BHS proposal submission, include the following items listed below.
 1. All line-item costs are for the Owner's reference and comparison. The cost of these work items shall be included in the base bid, and not be misconstrued as unit costs.
 2. Any exceptions to these specifications, drawings or contract terms in a separate section (titled "Exceptions").

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3. Identification of any requirements that are more stringent than what is shown (in the drawings and/or specifications).
 4. Notification of any potential safety hazard with the specified design of the system or its components.
 5. The BHS contractor's requirements for any "Lay-Down areas" (include line-item cost for offsite storage).
 6. Project schedule outline by phase, for the implementation of the BHS.
 7. Notification if an adjustment is necessary for the BHS contractor's submittal deadlines.
 8. Included in the BHS proposal the BHS contractor shall provide a recommended spare parts list with pricing for each system.
 9. List of BHS contractor's related Projects including client, current contact phone number, current email address, website, physical location, and type of work, date completed and overall cost.
 10. Provide a list of all personnel staff with resumes and qualifications that shall be working on this Project. Include on-site and off-site participating staff and their corresponding job function. The Owner (or OAR) reserves the right to approve or reject any BHS contractor's key personnel from the list.
 11. The type and the duration of the proposed BHS O&M training programs, if different than the minimum requirements (listed in the specifications).
 12. Indicate the types and quantities of required testing material as well as manpower.
 13. Provide a line item cost for any additional onsite support after final acceptance.
 14. Provide acknowledgement that the bid submitted includes all of the necessary work to meet the requirements for this Project.

1.12 BHS SUBMITTALS

1.12.1 Submittal General

- a) All BHS submittals shall adhere to the processes and requirements of the Division 0 and Division 1 specifications for this project.
- b) All submittals shall be prepared in the "English" language.
- c) BHS submittals shall be in accordance with the conditions of the Contract and Specifications. Submit the documentation at the time specified during the course of the work, and in accordance with the Submittal Deadlines.

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- d) All document and drawing submittals shall be provided with a bound cover page, an index, and a table of contents identifying the submittal contents. All drawings submitted shall have the appropriate title, date of the original drawing, revision number, and current date.
 - e) The Owner (or OAR) shall review, comment and transmit all comments in writing on each required submittal within fourteen (14) calendar days upon receipt of the complete submittal. Partial submittals are not acceptable.
 - f) The BHS contractor shall submit the proposed catalog data (cut sheets) of all equipment to be furnished, within three (3) weeks of the award of the BHS contract.
 - g) All the BHS drawings that are submitted shall become the property of the Owner (or OAR).
 - h) Submit each BHS shop and installation drawing for review, as follows:
 - 1. Two (2) ANSI-"D" size copies and two (2) electronic copies in ".pdf" format (latest version).
 - i) The Owner (or OAR) shall review (and Red-Line) the BHS drawings and/or documentation and return them for Revision and Re-submittal within 21 calendar days.
 - j) The BHS contractor shall "Revise and Re-submit" the BHS drawings and/or documentation for final review to the Owner (or OAR) within 14 calendar days.
 - 1. Any corrections or changes on the returned BHS drawings and/or documentation shall not be considered as an extra work order. The fabrication of any equipment is at the BHS contractor's own risk, until the receipt of the Owner's (or OAR's) approval. Any "Revised and Resubmittal" made by the contractor shall contain a matrix listing all corrections required and the mitigation taken to alleviate the comment. This matrix shall be submitted with the resubmission of each document.
 - 2. The Red-Line comments (and/or notes) on the BHS drawings and/or documentation from the Owner (or OAR) shall not indicate that the drawing has been checked in every detail. The Owner's (or OAR's) review and/or comments shall not release the BHS contractor of his responsibility of ensuring that the BHS equipment complies with all the specifications, drawings and functionality.
 - k) The BHS contractor shall be fully responsible for the functionality and dependability of the BHS and the associated systems and components as indicated in the drawings, specifications and other documentation submitted (including all subsequent amendments).
 - l) The BHS contractor shall not submit any drawings that are not in compliance with the Contract Documents unless a Change Order Request (COR) addressing the

discrepancy or change is sent with the submittal. In this situation the Owner (or OAR) should respond within the time frame stipulated within the Contract.

- m) Submit an updated BHS drawing list (that contains all of the anticipated installation and shop drawings) with each drawing submittal.
- n) BHS AutoCAD drawing borders shall include the following information:
 - 1. Three letter Airport code
 - 2. Name of the baggage handling system
 - 3. Drawing title
 - 4. Drawing scale
 - 5. Drawing sheet number
 - 6. Drawing revision level
 - 7. Date
 - 8. The project number shown on the contract drawings

1.12.2 Submittal Deadlines

- a) Provide all submittals for the BHS system in accordance with the requirements to the Owner (or OAR).
 - 1. Submittal Log -10 days after NTP and updated with each submittal.
 - 2. BHS Project Management Team - 10 days after NTP
 - 3. Quality Control Manual - 21 days after NTP
 - 4. Detailed Master Schedule - 21 days after NTP
 - 5. Product Data (Electrical & Mechanical) - 21 days after NTP
 - 6. Detailed Mechanical Shop Drawings - 30 days after NTP
 - 7. Detailed Electrical Shop Drawings - 45 days after NTP
 - 8. Functional Specification - 45 days after NTP
 - 9. Baggage Hygiene Policy - 30 days prior to BHS testing
 - 10. BHS Test Program (Static, Dynamic & Functional) - 21 days prior to owner testing
 - 11. BHS Warranty - 60 days prior to beneficial use
 - 12. Estimated Spare Parts List (Electrical & Mechanical) - 60 days prior to beneficial use
 - 13. O&M Manual Draft (for Owner Review) - 60 days prior to beneficial use
 - 14. BHS Training Program - 45 days prior to beneficial use
 - 15. O&M Manual Final - 14 days after DBU

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16. Closeout Documentation –14 days after DBU.
 17. PLC and Software Disaster Recovery Procedures –14 days after DBU.

b) Other Deadlines and Timetables

1. Work Activities Bulletin - 14 days prior to each activity
2. BHS Test Reports - 7 days after completion of testing
3. BHS Reliability Calculations - 14 days after start of beneficial use (live operations)
4. Certificate of Installation Compliance - 14 days after completion of BHS installation
5. Weekly Report - Last day of each week (schedule, open RFIs/RFSs, Slippage, 2-week, mitigation, roadblock, submittal status)
6. Revise & Re-submit Drawing Period - 14 days after red-lines returned from the Owner
7. Owner Review & Re-review Period - 14 days after BHS resubmittal

1.12.3 Project Management Team and Staffing Plan

- a) Submit to Airport for review and approval, the following listing of key personnel with resumes and qualifications that will be working on the project:
 1. Senior Project Executive
 2. Site Manager(s)
 3. Professional Engineer(s)
 4. Safety Manager
 5. Configuration Control/Schedule Manager(s)
 6. Quality Control/Assurance Manager(s) or On-Site Trades Coordinator(s)
 7. Project Manager(s) - Electrical and Control Systems Engineering
 8. Project Manager(s) - Mechanical Engineering
 9. Project Manager(s) - Computer Systems Engineering
 10. Instructors/training personnel (in addition, provide instructors professional qualifications)
 11. Subcontractors and points of contact for each Superintendent, Lead Engineer or Project Manager.
- b) Include site management and key team member percent participation and the phases that team members will be on-site.

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- c) Submit a staffing plan broken out by trade (e.g., number of millwrights, mechanical/electrical technicians and control/computer programmers) for each Phase of this project for review and approval by the owner (or OAR).
 - d) The site management team and other key team member shall have records of past performance to assure the Owner (or OAR) that they have the experience, competence and integrity to successfully complete a project of similar or greater magnitude.
 - e) The BHS Project Executive and Site Manager(s) shall not be changed without the owner's written approval.

1.12.4 Submittal Log

- a) Provide a log listing all required Project submittals to include, at a minimum, the following information:
 - 1. Type of submittal
 - 2. Title of submittal
 - 3. Specification reference
 - 4. Submittal revision number. (This shall also be clearly identified within the submitted document as well)
 - 5. The date submitted
 - 6. Submittal status
 - 7. Company or individual the submittal is sent to
 - 8. Date in which the submittal was returned after review has been completed

1.12.5 Master Schedule Contents

- a) The BHS contractor shall submit a detailed Master Schedule for review and approval by the Owner (or OAR) prior to any work. Show the schedule in an easy-to-read graphic form containing at a minimum the following:
 - 1. The beginning and ending of mechanical, electrical and controls engineering by subsystem (or phase)
 - 2. The drawing submittals and approvals by subsystem (or phase)
 - 3. The equipment fabrication by subsystem including lead times (or phase)
 - 4. The date equipment ships to site by subsystem (or phase)
 - 5. The mechanical, electrical, and controls installation by subsystem (or phase), along with tie-ins
 - 6. The system interface and integration dates
 - 7. Planned submittal
 - 8. The subsystem or phase of commissioning

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9. TSA or other third party required milestones for testing and commissioning related activities.
 10. The system acceptance testing by subsystem (or phase)
 11. The operational status dates by subsystem (or phase)
 12. The punch list correction date
 13. The final acceptance testing
- b) System Installation Phasing Plan
1. BHS contractor shall submit a detailed installation phasing plan, which identifies operational impacts for approval by the Owner (or OAR). Describe the preliminary phasing plan and any operational changes that shall be considered.
 2. The phasing plan shall provide the least amount of operational impact and utilize overnight tie-ins during non-operational hours whenever and wherever possible.
 3. Provide a phasing plan for each BHS subsystem with a description of the work, and the required staffing related to installation, and testing which may be required to ensure that the system remains operational during the project phasing.

1.12.6 Product Data

- a) Provide the bill of materials for BHS electrical and mechanical devices with part numbers and catalog cuts.
- b) Provide BHS product data (cut sheets) for all components for this Project. The equipment provided for this work shall be indicated appropriately on the cut sheets, (with arrows). The contractor shall ensure that like components are used wherever possible, match existing, so long as they meet the intents of the specification.
- c) After approval of the shop drawings, no variations from the submittal data shall be permitted except by written consent of the Owner (or OAR).
- d) The BHS documentation shall include the table of contents, electronic bookmark index tabs and revision notes, in searchable “.PDF” format.
- e) BHS products shall include but not be limited to:
 1. Motors
 2. BHS handling devices
 3. Gear reducers
 4. Bar Code scan guns
 5. Bearings

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6. Pulleys and rollers
 7. Motorized pulleys
 8. Clutches and Brakes
 9. Chains and sprockets
 10. Belts and Sheaves
 11. Gear reducers
 12. Queue conveyors
 13. Merge conveyors
 14. Power turns
 15. Fire/security doors and Draft curtains
 16. SS inspection tables and associated peripheral mounts
 17. Computers and peripheral devices
 18. HMIs
 19. MCPs
 20. Remote I/O Panels
 21. PLCs and associated equipment
 22. UPSs
 23. Soft starts and/or VFDs
 24. Control devices
 25. Wiring devices
 26. Graphical displays, monitors and mounting brackets
 27. Lift Gates
 28. Additional items that are included with the final BHS design

1.12.7 Mechanical Shop Drawings

- a) Shop drawings shall be submitted for approval, prior to fabrication. The shop drawings shall include verification of tug lane head room clearances. The contractor is responsible for coordination and conflict identification prior to installation. Any costs associated with conflict mitigation which was not identified prior to installation will be borne by the contractor.
- b) BHS layout plan with dimensions, section and elevation drawings of the system (that are keyed to the layout) with components tied to the bill of materials list, with building and other systems shown (in the background) for reference and coordination.

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- c) The overall mechanical system layout shall include building structure and interferences, building penetrations and/or modifications, motor locations, catwalks, crossovers, and clearances. Any building interferences and design deviations shall be clearly identified in the BHS contractor submittal.
 - d) Mechanical drawings shall contain BHS contractor's drawings, etc. and shall include the following at a minimum:
 - 1. Drawing index
 - 2. System layout drawing including existing conditions, final conditions and phases including necessary demo.
 - 3. Details and dimensions of all equipment (plan, elevation, and sections)
 - 4. Clearances both horizontal and vertical as related to the building structure
 - 5. Demo drawings when applicable
 - 6. Interferences
 - 7. Tug routing
 - 8. Dimensions and details, of any required building preparations or modifications
 - 9. Location and dimensions of conveyor drives.
 - e) The BHS contractor shall provide "signed and sealed" drawings and documents by a licensed Professional Engineer (PE) registered in the state in which the system shall be installed, for any drawings, calculations, and submittals required per the Owner (or OAR).
 - f) Provide the general arrangements with dimensions (plan, elevation, details and sections) of all mechanical equipment including but not limited to:
 - 1. Baggage conveyors and other baggage handling equipment
 - 2. Fire/Security doors
 - 3. Maintenance platforms and catwalks
 - 4. Crossovers
 - 5. Ladders and/or stairs
 - 6. Impact protection
 - 7. Safety signage
 - g) Provide drawings of the BHS maintenance access catwalks, ladders, stairs, ship's ladders, crossovers, panel locations and details to ensure components can be safely and easily accessed and maintained.
 - h) Provide detail drawings of drive, take-up, end roller and break-over assemblies. Provide detail drawings of stainless steel conveyor shrouding and/or custom

equipment and any other details that may be necessary and/or requested by the Owner (or OAR).

- i) The contractor shall submit a detailed BHS motor schedule for the new and/or modified conveyors. The BHS motor schedule shall include the following:
 - 1. Equipment ID
 - 2. Equipment type, (queue, transport, power-turn, etc.),
 - 3. Conveyor centerline length
 - 4. Elevation change
 - 5. Motor horsepower
 - 6. Motor type. (Clutch/Brake, VFD, etc.)
 - 7. Service Factor
 - 8. Reducer Ratio
 - 9. Voltage
 - 10. Nameplate amperage (FLA)
 - 11. MCP, source of power feed, Circuit breaker size
- j) Structural Attachments
 - 1. Submit structural attachment detail drawings and the design computations of all structural supports for the new and/or modified portions of the BHS and associated platforms and/or walkways "signed and sealed" by a registered Professional Engineer (PE) licensed in the same state or jurisdiction of the work.
 - 2. Submit for review, the design and locations of all structural attachment points, wherever the equipment shall be supported by the building structure. Identify (as a minimum) the type of anchor device to be used and the amount of load to be imposed.
 - 3. Submit a complete vibration isolation drawing package, showing isolation type, as well as method and location of installation.
 - 4. The BHS contractor shall submit structural, vibration isolation and seismic detail drawings and calculations for all attachments and supports used on the BHS equipment or access platforms. This shall include a certification that the existing infrastructure can accommodate the BHS equipment loading.
 - 5. Provide the location, type and load of the supports and lateral bracing, and additional steel members, necessary to support conveyors.
 - 6. Identify the method of attaching the conveyors to the structure or floor. The load points and load amount to be supported by the existing structure shall

be evaluated and confirmed by the BHS contractor and approved by the Owner (or OAR).

7. Provide the front, side and section views of all conveyor components. Show the location, dimensions and rating of conveyor drive units. Indicate the method of attaching adjacent conveyor sections.

1.12.8 Electrical Shop Drawings

a) Electrical drawings shall contain the following at minimum:

1. Power source identification and sizing
2. Schematics of each MCP
3. Field control wiring schematic
4. VFD settings
5. Remote panel schematics
6. Power requirements
7. Interior and front panel layout of MCPs
8. Pushbutton station layout
9. Location of all controls field devices
10. Estop zoning layouts
11. Conduit types and sizes
12. Wire sizes and numbers
13. Demo drawings and procedures where applicable

b) Reference Electrical Specifications for additional requirements of the following:

1. MCPs
2. Control devices
3. Control stations
4. Beacons and horns
5. Stack lights
6. Remote alarms
7. Motors
8. Motor safety disconnects switches
9. Photo-eyes
10. Shaft mounted encoders
11. E-Stops

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- c) BHS detailed electrical shop drawings shall be provided for the following:
 - 1. Photo-eye schedule
 - 2. System interfaces
 - 3. Integration flow charts
 - 4. Wiring diagrams
 - 5. Networked components (if required)
 - 6. Associated displays
 - 7. Related control devices
 - 8. MCP locations
 - 9. Computer and/or PLC architecture diagrams
 - 10. Motor schedules (include motor horsepower, frame size, full load amps and speed).
 - d) The contractor shall provide demo drawings and instructions whenever the project work involves disabling portions of a conveyor/control system. These drawings and instructions shall contain all information required to accomplish this work safely and keep the remaining systems operating as required.
 - e) The BHS contractor shall provide signed and sealed drawings and/or documentation by a Professional Engineer registered in the state or jurisdiction in which the system is installed for the following items if applicable:
 - 1. New and/or existing modified BHS motor control panel connected load calculations
 - 2. Any drawings, calculations, or submittals required per the federal, state, or local codes
 - f) Provide ANSI "D" size copies of the electrical schematic wiring diagrams for placement in each associated MCP.

1.12.9 Functional Specification

- a) Provide a macro level process/bag flow description as well as a detailed functional description of each BHS conveyor subsystem.
- b) Functional Specification shall contain Human Machine Interface Terminal (HMI) screens/menus for each associated system and/or subsystem and a complete description of its operation and equipment monitored.
- c) BHS Physical Description - Provide a physical description of the overall conveyor systems, identifying the following:
 - 1. Each conveyor subsystem
 - 2. Location of primary components

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3. Operator controls
 4. Accessory components
- d) BHS Electrical Description - Provide a description of the following:
1. Motor Control Panels
 2. Programmable Logic Controllers
 3. Operator Interface Terminals
 4. Baggage Status Displays
 5. Control Stations
 6. Operator control devices
 7. Encoders (if applicable)
 8. Photo-eyes
 9. Limit Switches
 10. Audio and visual alarms
- e) Reference the specific drawings for each electrical control schematic.
- f) Provide safety precautions to be followed by operating personnel, to include but not limited to:
1. Start-up
 2. Shutdown
 3. Oversize detection
 4. Out-Of-Gauge (if applicable)
 5. Jam detection
 6. Overload / MPS
 7. Motor Safety Disconnect
 8. Emergency Stop procedures

1.12.10 Test & Inspection Program

- a) The BHS Test & Inspection Program shall be submitted for the Owner's (or OAR's) review and approval. The BHS contractor shall assume the responsibility to meet with the Owner (or OAR), to review the "Test Plan" and ensure the BHS meets all the requirements.
- b) The BHS contractor shall submit test plans including the procedures for conducting Static Inspections, Dynamic Observations, Load testing and Functional testing.

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- c) The BHS shall provide a Functional Test Plan submittal shall include tests that are based on the BHS description of operation. The Functional Test Plan shall identify and demonstrate all system control functions relating to the operational, functional and system performance tests. The Functional Test Plan is to list each control station, and control device, and its related control function that is to be demonstrated/tested. The Functional Test Plan shall contain testing for proper interfacing and function of integrated systems such as fire systems, security systems, and other systems.
 - d) A Certification of Test Compliance shall be provided by the BHS contractor, and signed by the Owner (or OAR), after the system is proven to be acceptable and in compliance with all the testing requirements and specifications.
 - e) Refer to the acceptance and testing section of this specification for detail test plan content requirements.

1.12.11 Warranty

- a) Submit two (2) draft copies on approved electronic media, of the BHS warranty for the complete operating Baggage Handling Systems, 60 days prior to beneficial use (for the Owner's review).
- b) Refer to Section 1.13

1.12.12 Estimated Spare Parts List

- a) Submit the BHS recommended electrical and mechanical critical spare parts lists to include at a minimum:
 1. Item Number
 2. Description (i.e. size, measurement, revision, etc.)
 3. Manufacturer
 4. OEM part number (not BHS contractor internal number)
 5. Quantity by subsystem
 6. Overall total system quantity
 7. Recommended spare inventory level
 8. Criticality level
 9. Item cost at time of project purchase
 10. Lead time

1.12.13 O&M Manual

1.12.13.1 O&M Manual Purpose

- a) The main purpose of the "O & M" manual shall provide the Owner's "Operational" and "Maintenance" personnel with the following:

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1. A thorough understanding of the layout of the BHS
 2. MCP and Control Station locations
 3. The BHS functions
 4. Special features
 5. Operational requirements
 6. Maintenance requirements
 7. Parts information
 8. Warranty information
 9. Safety considerations
 10. Operating and maintaining the BHS safely and effectively
- b) This specification section is intended as a guide to indicate the basic requirements of the O&M manuals.
 - c) The BHS contractor's standard O&M manual shall only be acceptable if the systems are functionally equivalent to that specified, and the documents are appropriate and usable for the intended purpose.
 - d) The O&M manual shall contain only the equipment and functions used in this project.

1.12.13.2 The O&M manual shall be divided into two main sections:

- a) The "Operational" portion of the manual shall present the information required for personnel to be able to operate the system in a safe and efficient manner. The Operational information shall be presented in easy to understand terms, to ensure that personnel not familiar with the system shall have a thorough understanding of the system upon reading the operational information.
- b) The "Maintenance" portion of the manual shall present the information required for personnel to be able to maintain the system in a safe and efficient manner. The Maintenance information shall be presented in easy to understand terms, to ensure that personnel not familiar with the system shall have a thorough understanding of the mechanical and electrical equipment operation and maintenance requirements, so that they shall be able to perform maintenance functions effectively and safely such as:
 1. Inspection
 2. Troubleshoot
 3. Service
 4. Repair

5. Replace

1.12.13.3 Binder Type

- a) Binders shall be of the "presentation" type equipped with "D" rings.
- b) The binders shall be equipped with a clear spine pocket to permit the insertion of the manual title.

1.12.13.4 O&M Manual Format

- a) The O&M manual shall be contained within at least two (2) volumes of appropriate size. Note that additional volumes may be required to accommodate multiple operational and/or maintenance information chapters.
- b) The title information shall be generally as follows:
 - 1. First line: Three letter code of the Airport in which the system is located.
 - 2. Second line: "Operations Manual" or "Maintenance Manual"
 - 3. Third line: "For"
 - 4. Fourth line: Type of system: (such as: Airside __; Outbound Baggage Handling System)
 - 5. Fifth line: Date of System, as based on actual Beneficial Use date
 - 6. Sixth line: Project Number (to be Coordinated with the Owner)
- c) A "Record of Revisions" sheet shall be provided at the beginning of the O&M manual.
- d) A Table of Contents shall be provided at the beginning of the O&M manual.
- e) Each chapter shall be identified with an index tab with permanently printed information. Each chapter of the O&M manual shall begin with an index for the related chapter.

1.12.13.5 Operational Information

- a) Glossary of Operational Terms shall include a glossary of operational related terms and equipment identification/designations.
- b) System Overview shall include, at a minimum, the following items:
 - 1. A basic overview of the system showing overall layout and arrangement.
 - 2. Identify locations, number of and types of inputs.
 - 3. Identify locations, number of and type of sort areas (as appropriate).
 - 4. Identify system and subsystem conveyor designations.

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5. Processing rate of each subsystem as well as the total system-processing rate.
- c) Baggage Weight and Size Limitations shall include, at a minimum, the following items:
1. Normal Size Baggage
 2. Overheight Baggage
 3. Overlength Baggage
 4. Out of Gauge Baggage
 5. Baggage that can be processed by system, but requires special considerations or handling, such as skis, golf bags, etc.
 6. Airline Baggage Hygiene Policy
- d) Detailed Description of System Operation shall include, at a minimum, the following items written in a clear concise manner:
1. The detailed operational description of system operation shall be written to provide operational personnel a thorough understanding of how to operate the system.
 2. Operational personnel include Passenger Service - Ticket Agents, Screening staff, Airline Baggage Handlers, BHS Operators, BHS contractor.
 3. The operational information shall cover system start-up and shut down requirements.
 4. The operational information shall also provide a thorough understanding of the system "Fault Annunciation" so that faults can be recognized and appropriate action can be directed.
 5. The operational information shall provide an operator's troubleshooting guide for the safe and effective correction of operational problems.
 6. The operator's information shall also include procedures and recommendations for a contingency plan (if required) due to various equipment or subsystem failures.
- e) Operational Safety shall provide safety information related to the proper and safe operation of the specified system and its equipment from an operator's point of view, and at a minimum shall cover the following items (this list is not to be construed as being complete since it is provided only as a guide):
1. Pre-operating Procedure
 2. Start-up and Shut-down Procedure

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3. Jam Detection, Clearance and Restart Procedure
 4. Oversize Detection, Clearance and Restart Procedure
 5. Emergency Stop and Restart Procedure
 6. Motor Safety Disconnects
 7. Lock-Out/Tag-Out Procedure

1.12.13.6 Maintenance Information

- a) Glossary of Terms and Identification shall include a glossary of all associated terms and equipment identification/designations used with the specified system.
- b) Description of System Equipment shall include, at a minimum, the following items:
- c) Detailed description of the mechanical conveyor equipment used in the system including widths of conveyors, general specifications and capabilities of the system.
- d) Detailed description of the electrical equipment used in the system, including the location of Motor Control Panels (MCPs), PLCs, fire/security doors, etc.
- e) Electrical Control Sequence of Operation shall include a detailed description of the electrical control sequence of operation. The detailed description shall cover the following items (this list is not to be construed as being complete since it is provided only as a guide):
 1. Control Stations
 2. Photo-eyes
 3. Encoders
 4. Motor Safety Disconnects
 5. MCPs
 6. PLCs
 7. HMIs (if required)
 8. Fire/Security Doors
- f) Maintenance Safety Procedures shall provide safety information related to the proper and safe operation and maintenance of the specified system and its equipment from a maintenance point of view, and at a minimum, the following items shall be covered (this list is not to be construed as being complete since it is provided only as a guide):
 1. Pre-operating Procedure

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2. Start-up and Shut-down Procedure
 3. Emergency Stop and Restart
 4. Jam Detection and Restart
 5. Oversize Detection and Restart
 6. Motor Safety Disconnect
 7. Lock-Out/Tag-Out Procedure
- g) Service, Inspection and Preventive Maintenance shall provide detailed information for the proper servicing of all of the system equipment and at a minimum shall cover the following (this list is not to be construed as being complete since it is provided only as a guide):
1. A general explanation, regarding what the servicing requirements are for the related system equipment.
 2. Provide a List of Lubricants for each BHS component including the lubricant type, rating and manufacturer if applicable.
 3. Detailed preventive maintenance program outlining required functions and frequencies for the proper preventive maintenance of the components that make up the system equipment items such as:
 - i. Load Conveyors
 - ii. Transport Conveyors
 - iii. Queue Conveyors
 - iv. Power Turns
 - v. 45 Degree Merges
 - vi. Fire/Security Doors
 - vii. Motor Control Panels.
 4. It shall be noted that the information (i.e. cut sheets) shall be "brand specific" for the actual equipment provided for this system only. Information for equipment types and brands that are not provided in this system shall not be acceptable.
 5. At a minimum, the following items shall be covered, however; this list is not to be construed as being complete since it is provided only as a guide.
 6. Inspections for:
 - i. Straight Conveyors
 - ii. Queue Conveyors
 - iii. Power Turns

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- iv. Merge Conveyors
7. Lubrication of:
- i. Motor Bearings
 - ii. Pulley Bearings (as required)
 - iii. Drive Chains
 - iv. Speed Reducers
 - v. Power Turn Perimeter Chains and Guides
8. Cleaning of:
- i. Motors
 - ii. Drive Chains
 - iii. Speed Reducers
 - iv. Photo-eyes (and related reflectors),
 - v. Motor Control Panels
9. Adjustment of:
- i. Straight Conveyor Belt Tracking
 - ii. Straight Conveyor Belt Tensioning
 - iii. Power Turn Conveyor Belt Tracking and Tensioning
 - iv. Merge Conveyor Belt Tracking and Tensioning
 - v. Drive V-Belt and Sheave Alignment
 - vi. Drive V-Belt Tensioning
 - vii. Drive Chain and Sprocket Alignment
 - viii. Drive Chain Tensioning
 - ix. Drive Motor Clutches
 - x. Drive Motor Brakes
 - xi. Photo-eye alignment and sensitivity adjustment
- h) Warranty Information and Procedures shall provide detailed information regarding the specific Warranty Conditions that prevail on the specified system. The detailed information regarding the system warranty shall include the following:
- 1. Date of Beginning and Expiration of Warranty Period.
 - 2. Specific instructions regarding the procedures for the documentation and return of items under warranty.

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3. Names and phone numbers of the "point of contact" for warranty questions and discussions.
 4. Note that the "point of contact" information shall be provided for both "normal" 0800 to 1700 Monday through Friday hours as well as "after hours".
- i) Troubleshooting shall provide detailed information for the proper troubleshooting of the system equipment. At a minimum, the following items shall be included in a detailed "problem and correction" type of troubleshooting chart (this list is not to be construed as being complete since it is provided only as a guide):
 1. All mechanical equipment
 2. All electrical equipment
 3. All control equipment
 4. All computer equipment
 - j) The troubleshooting information provided in the chart shall cover an exhaustive list of possible causes of system failure or malfunction. The information shall be arranged in a three (3) - column format with respective headings of:
 - i. Trouble
 - ii. Probable Cause
 - iii. Corrective Action
 - k) Empirical Readings: This chapter shall include the Empirical Readings, (as noted in "Testing and Acceptance" section of this Specification) that were recorded at the time of the Conditional Acceptance Testing and Inspection of the system. This information shall be provided as maintenance reference documentation.
 - l) Removal and installation procedures: The BHS contractor shall provide adequate detailed information for the proper removal and installation of all of the system's equipment and components (i.e. conveyors, power turns, and fire/security doors).
 1. It shall be noted that the information shall be "brand specific" for the actual equipment and components provided for this system.
 2. Information for equipment and/or components, types and brands that are not provided in this system shall not be acceptable.
 3. At a minimum, the following information shall be included in this chapter (this list is not to be construed as being complete since it is provided only as a guide):

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- i. Basic Considerations
 - ii. Safety Precautions
 - iii. Procedural Orientation
 - iv. Torque Values (electrical and mechanical)
 - v. V-Belt Tension Procedures and Values
 - vi. Drive Chain Tension Procedures and Values
 - vii. List of special tools, gauges and equipment required for the maintenance of the system, together with illustrations and instructions as to how they are to be used. Sources for procurement of these items shall also be provided.

4. Component List

- i. Straight conveyors
 - ii. Power turn conveyors
 - iii. Merge conveyors
 - iv. Queue conveyors
 - v. Fire/security doors
 - vi. Motor Control Panels (MCP's)
- n) Illustrated Parts Information shall contain detailed illustrated parts information. The illustrated parts information shall be provided for all mechanical and electrical equipment.
1. Clear, concise, exploded view, isometric drawings showing all the parts, the relationship of adjacent parts with one another, as well as the diagram number that shall reference the specific part on the adjacent parts information sheet.
 2. The parts information sheet shall be adjacent to the isometric drawing and shall contain:
 - i. Part reference number from isometric drawing
 - ii. Part description
 - iii. Part Number
 - iv. Manufacturer of part
 - v. Number of parts found in the conveyor equipment isometric drawings
 3. Provide the above information in a manner so that the isometric drawing (up to 11" x 17", that can be folded up) shall be on the left-

hand side of the open manual, with the associated parts information sheet as the right-hand page of the open manual.

4. Include model and serial numbers for all special equipment such as fire/security doors, power turn conveyors, etc.
- o) Manufacturer's Literature: Shall provide all of the manufacturer's literature for all of the conveyor equipment (mechanical, electrical and electronic components).
1. It shall be noted that the information shall be "brand specific" for the actual equipment and/or components provided for this system only. Information for equipment and/or component types and brands that are not provided in this system shall not be acceptable.
 2. Only a first copy of the manufacturer's original literature shall be accepted if the actual original manufacturer's literature cannot be provided.
 3. All such copies shall be clear and legible.
 4. Preferably, print the manufacturer's cut sheets (pdf format) from the internet, as needed.
 5. All manufacturers' literature shall be appropriately highlighted with a legible solid arrow for identification of the specific model (or type of device) used in the specified system.
 6. All manufacturers' literature shall include information adequate for proper servicing of the item, proper operation of the item, as well as all required information for the ordering of the item.
 7. Provide a complete list of parts manufacturers including website, address, telephone number, point of contact, phone number, e-mail address, etc.
- p) Mechanical Drawings: This chapter shall contain a complete, clear and legible 11" x 17" set of "As-Built" BHS mechanical drawings.
- 1) The 11" x 17" drawings are to be folded so that they shall fit within the O & M Manual.
- q) Electrical Drawings: This chapter shall contain:
1. A complete list and definition of the electrical symbols used in the electrical drawings.
 2. A complete, clear and legible 11" x 17" set of "As-Built" BHS electrical drawings. The As-built drawings shall contain as a minimum the following:

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- i. Detailed wiring connection drawing noting each control device, control station, motor, etc., in block form with a detail of the actual "field wiring" numbers and configuration.
 - ii. Detailed conduit routing diagram indicating size of conduit, size and number of conductors, junction boxes, control devices, motors, and safety disconnect switches, motor control panels, etc.
 - iii. Detailed block diagram representing internal layout of components within each motor control panel, both internal as well as external layout of components.
 - iv. Schematic Wiring Diagram of each MCP, including outline and wiring diagram of all special devices.
3. An additional approved 11" x 17" reduced copy shall be placed in the door pocket of the MCP.
 4. The 11" x 17" drawings are to be folded so that they shall fit within the O & M manuals.
- r) Software Listings – Provide a complete list of operating systems and software packages used in the project. Provide versions and any other pertinent information required for replication.

1.12.14 Training Plan

- a) Submit a detailed "BHS Training Plan" outline and course material. The Training Plan submittal shall include the following:
 1. Course Outline including major topics of discussion and approximate durations of each.
 2. Course materials
 3. Course proposed schedule (dates and times)
 4. Location requirements
 5. Course intended audience (airline personnel, maintenance and TSA)

1.12.15 Closeout Documentation

- a) Provide all closeout documentation for the BHS system in accordance with the requirements, upon final completion and acceptance of the system by the Owner (or OAR).
- b) The BHS contractor shall submit to the Owner (or OAR) via the General Contractor (GC) the following documents:
 1. Test documentation
 2. Final completed punch list

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3. Final O&M - two (2) hard copy and two (2) soft copies
 4. Two (2) hard copy and two (2) soft copy as-built electrical and mechanical drawing sets to the owner,
 5. One (1) hard copy 11x17 as-built electrical drawing set in the applicable MCPs.
- c) The BHS contractor shall submit to the Owner (or OAR) via the General Contractor (GC) the following as-built documents, unless otherwise specified, in electronic copies in their native software file format, i.e. "acd", "dwg" format and searchable bookmarked PDF.
1. Final Description of Operations
 2. Mechanical Drawings
 - Cover Sheet & Index
 - Legend
 - Overall Plan View
 - Overall Plan Existing
 - Isometric (if 3D)
 - ETD Egress Plan
 - ETD Plan View (1/2" scale if possible)
 - Flow Chart
 - Standard Details
 - 1/8" scale plan views
 - 1/4" scale elevation views
 - Catwalk Drawings
 - Structural attachment drawings (including load drawings)
 - Structural Details
 - Phasing Drawings
 3. Electrical Drawings
 - Cover Sheet & Index
 - Legend
 - Manifest with power summary and belt speeds
 - Control Device Plans 1/8" scale
 - E-Stop and Failsafe Zones
 - I/O and Device Wiring Diagrams

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- MCP Exterior and Interior Layouts
 - Control Device and Remote Enclosure Details
 - Network Diagrams Lower Level (PLC)
 - Network Diagrams Upper Level (Sort and MIS/MDS)
4. The PLC program including lower level network files.
 5. The Upper Level (Sort and MIS/MDS) programs source files
 6. HMI software documentation and source programs
 7. PLC, Network and Software disaster recovery procedures including, but not limited to the following:
 - Documentation containing circumstances and procedures for recovering the PLC, Lower an Upper level networks, MDS/MIS applications and data, BSDs, BMAs and workstations in a disaster situation.
 - Software recovery applications and recovery procedures.
 - Instructions for restoring network operation, network configuration and security settings.
 - Procedures for recovery from hardware failure such as communication hardware, memory, and disk drive failures.
- d) Electronic File Naming Conventions - The electronic file names shall conform to the following convention:
- ABC_XXXX_LOCATION_MMDDYYYY_TYPE_DESCRIPTION.EXT
1. ABC is the FAA airport identifier
 2. XXXX is the International Air Transport Association (IATA) airport identifier
 3. LOCATION is a unique description of the project location such as T1, NODE1, etc.
 4. MMDDYYYY is the file date represented as month, day, and year utilizing leading zeroes where applicable
 5. TYPE is the file type as follows:
 - NARR is a narrative
 - PLC is a PLC program
 - NET is a network configuration
 - DWG is a drawing
 - VFD is a VFD configuration
 - IDX is an index

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- HMI is an HMI configuration
 - LIST is a spreadsheet list
 - FIRM is a firmware listing
6. DESCRIPTION is a free text field to describe the file contents
7. EXT is the file extension
- e) A Control System Architecture Overview shall be submitted that follows the requirements of the current PGDS standards.
1. Summary - A descriptive summary narrative of the submittal shall be included in Microsoft Word and PDF format. This summary shall include, at a minimum, the following information:
- Airport name and area of the airport included in the submittal such as terminal, matrix, node, etc.
 - Description of the conveyors / sub-systems and their controller equipment. At a minimum, the following information shall be provided:
 - i. List of each PLC and the conveyors / sub-systems it controls
 - ii. List of each MCP and the conveyors / sub-systems it controls
 - Contact information for:
 - i. Operation and/or maintenance contractor (if applicable) primary point of contact
 - ii. Point of contact responsible for follow-up submittals
2. Index - An index of the documents included in the submittal shall be included. This index shall be submitted in Microsoft Excel and PDF format. The index shall include, at a minimum, the title of each file, the file date and the electronic file name.
3. PLC Code and Associated Configuration Information - The low level, or PLC control, submission shall include the following at a minimum.
- PLC Program: A copy of the PLC program shall be submitted in its native format for all PLCs. In the event multiple levels of PLCs are utilized all programs are to be included. This shall include any redundant PLCs that may exist. All software keys and or passwords shall be provided if programs are protected and or locked in some way.
 - Network Configuration: A copy of all network configuration files shall be submitted in its native format. This shall include any redundant networks that may exist.
 - Variable Frequency Drive (VFD) Configuration: A copy of the

configuration of each VFD shall be submitted in its native format. The configuration submittal shall include all parameters including unchanged or default settings.

- Communication and Other Controllers: A copy of the configuration and/or code for all other devices as a part of the control system shall be submitted in its native format. An example of these devices might be co-processors or multi-vendor interfaces.
 - Firmware Configuration: A spreadsheet listing all control devices and their associated firmware levels, where firmware is used, shall be submitted. This spreadsheet shall be submitted as both a Microsoft Excel document and as a PDF file. All devices which have firmware shall be included. Examples of these devices are PLC chassis, PLCs, I/O modules, Network modules, Communication modules and VFDs.
4. HMI Configuration - A copy of all HMI configurations shall be submitted in their native format. Examples of these HMIs are control room graphical display systems, operator interface panels, bag display monitors or any other computer or dedicated display modules.
 5. Programming and Configuration Software - A spreadsheet listing all programming and configuration software with the revision level used shall be submitted. This spreadsheet shall be submitted as both a Microsoft Excel document and as a PDF file. Examples of this software are PLC programming software, network configuration software, HMI configuration software and multi-vendor interface programming / configuration software.
- f) The BHS contractor is responsible to respond to and correct any submittal comments made by the OAR. These rectifications should be accomplished and coordinated with the OAR and finalized by the BHS Contractor for proper closure.

1.12.16 Design and Construction Phase Weekly Updates

- a) The BHS contractor shall provide weekly updates of the master schedule.
- b) If the BHS contractor is fourteen (14) or more calendar days behind the original approved Master Schedule, then a recovery plan shall be submitted.
- c) Design and Construction Phase weekly updates shall include:
 1. Status payments
 2. Status of RFIs/RFSs
 3. BHS engineering issues
 4. Equipment interface issues
 5. Installation Issues
 6. Tasks & deliveries for the following week

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7. Right of ways
 8. Building interface (i.e. facility fire alarm, security access control systems)
 9. Coordination issues
 10. Percentage of testing complete
 11. Phasing plans and two week look ahead
 12. Overnight Tie-ins
 13. Temporary construction requirements

1.13 BHS WARRANTY

1.13.1 General

- a) The BHS equipment warranty period shall be 12 months for the complete operating Baggage Handling Systems for defective materials and workmanship from date of beneficial use for each subsystem (as specified herein).
- b) If these warranty provisions conflict with other required warranties within the overall project documents and specifications, the more stringent (as determined by the Owner) shall apply.
- c) The BHS contractor shall transfer all warranties to the Owner for materials and equipment received from subcontractors and suppliers.
- d) The BHS contractor shall warrant existing relocated and/or reused and refurbished BHS equipment for 12 months against defective parts and labor. This warranty shall not include non-refurbished and non-relocated BHS equipment.
- e) The BHS contractor shall agree to repair or replace any defective materials and associated workmanship during the warranty period.
- f) Defective materials and workmanship are considered to include occurrences such as but not limited to:
 1. Unsafe conditions
 2. Operational failures
 3. Unusual conditions
 4. Unexpected conditions
 5. Unsatisfactory conditions
 6. Performance below the minimum requirements
 7. Excessive deterioration
 8. Excessive aging
 9. Excessive noise

10. Excessive vibration

11. Abnormal wear

- g) If any of the above defects occur within the warranty period, the BHS contractor shall repair or replace the defective items and assume the full costs of labor and materials. The BHS replacement items shall be new and meet the requirements of this specification.
- h) The BHS contractor shall provide "on-site" mechanical and electrical technical support, and on-call PLC and software support for a period of 14 days starting on the date of Substantial Completion, and "on-call" technical support for a period of 14 days thereafter. These time frames shall apply when multiple Substantial Completion dates or phases are required by the Contract Documents or the work.

1.13.2 Controls Warranty

- a) The BHS and associated equipment shall be capable of functioning for a minimum of 10 years.
- b) All the BHS industrial computer equipment and peripherals shall be available to purchase for warranty and/or maintenance replacement for a duration of two (2) years.
- c) All the PLC, and HMI components shall be available for three (3) years.
- d) If the BHS contractor cannot adhere to the above listed conditions, they shall provide alternative sources of suppliers. The functionality and compatibility of the BHS spare parts list (from an alternate source) shall be provided by the BHS contractor.

1.13.3 Design Warranty

- a) The BHS contractor shall provide a warranty against any "Design Failure" for five (5) years (beginning at "Final Acceptance") which states:
 - 1. The BHS, equipment, materials, software, and controls (furnished and/or installed) shall be free from faults or defects in design.
 - 2. The BHS shall conform to the functional and technical requirements of the Contract Drawings and specifications. The BHS shall comply with all the applicable laws, statues, ordinances and codes.
 - 3. The BHS contractor shall provide the Owner a design warranty guaranteeing the design application and overall system integration of the BHS components, sub-components, sub-assemblies and parts utilized are free from faults, patent infringements and defects in design, application and/or integration.

1.13.4 Parts and Labor Warranty Terms

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- a) The BHS contractor shall be required to supply a “Parts and Labor” warranty, which states that the BHS contractor shall proceed with and perform the work in the best and most workmanlike manner.
 - b) The “Parts and Labor” warranty shall state that the BHS contractor conforms to all the applicable laws, statutes, ordinances and codes, and that the BHS is suitable for the intended use.
 - c) The BHS warranty shall state that the technical requirements and functionality (as specified in the contract documents and specifications) have been complied with.
 - d) Any equipment, parts or materials that were taken from the Owner’s spare parts inventory (to complete warranty service work) shall be replaced by the BHS contractor (within two weeks of removal notification).
 - e) The BHS materials and equipment that are provided and/or installed, shall be new and free from defects in materials, workmanship, detail or incorrect selection.
 - f) Any BHS equipment, parts or materials that have excessive wear shall be considered a defect.

1.13.5 Period and Responsibility

- a) If within the warranty period, the work, the system, or any piece of equipment or material is determined to not conform to the warranty, then the BHS contractor shall (within 24 hours of the notification), commence work to correct, repair or replace the defect and/or design flaw.
- b) The Owner (or OAR) may decide to perform the normal warranty labor for repair work with their own maintenance staff and parts, (at the BHS contractor’s expense).
- c) All the details of any warranty work to be performed by the Owner (or OAR) shall be negotiated between the Owner (or OAR) and the BHS contractor, (prior to the commencement of the work).
- d) The BHS contractor shall provide all the labor and parts for work related to the warranty claim, whether corrected by the owner or contractor during the warranty period.
- e) Any replacement parts that are required shall be shipped, “freight pre-paid”, to the location specified by the Owner (or OAR).
- f) Any failed and/or malfunctioning parts shall be returned to the BHS contractor within ten (10) days of the notification of detection.

1.14 SAFETY

1.14.1 General

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- a) The BHS contractor shall guarantee that all of their systems and associated components satisfy all the legal safety requirements, (required by associated governing agencies). All safety measures shall be in accordance with and follow (federal as well as local) OSHA and/or other safety regulations.
 - b) All safety measures shall protect the working staff of the BHS from injuries. This includes work platforms and tug & dolly ram protection, as well as all other areas of the BHS where only the maintenance staff has access.
 - c) The BHS contractor is fully responsible to investigate and incorporate into their design, any additional safety features and/or requirements which may be required.

1.14.2 System Safety

- a) The BHS contractor shall utilize control methods and techniques, circuitry, mechanical and electrical equipment and operating and/or maintenance procedures to provide maximum safety for operation and maintenance personnel. This shall also minimize potential damage to the equipment and to the baggage being processed.
- b) Incorporate fail-safe techniques to prevent the occurrence of unsafe conditions, which could result from an equipment failure or improper implementation of the operating procedures.
- c) As employed herein, the fail-safe principle shall be interpreted as follows:
 - 1. In the event an equipment failure or external influence such as improper operation, high temperature, power failure, or other adverse condition affects the proper function of a system or element involved with the safety of life or health, said system or element shall revert to a state known to be safe to all personnel interfacing with the equipment.
- d) The BHS contractor shall ensure that all furnished and installed equipment meets all applicable local, state and federal safety codes and requirements.

1.14.3 Personnel Safety

- a) The BHS contractor shall provide convenient means for emergency system shutdown, as well as for reset/restart.
- b) Provide adequate means for ensuring the safety of all personnel who have access to the system in the system design. The BHS contractor shall provide sufficient safety signage throughout the system. Provide ample work space in all limited BHS access areas
- c) The operation of the system shall be convenient and safe to use, and control functions to be performed shall be simple, to minimize possible errors.
- d) Provide lockable devices such as motor safety disconnect switches and lockouts to prevent the accidental activation of those portions of the system shut down for

maintenance. These devices shall be located in all associated areas and labeled properly for the associated equipment.

- e) Provide equipment and component guards on all drives for conveyors and associated devices. House all moving parts in personnel areas with guards, (painted OSHA #1016 or #1026 "Safety Yellow") for Bearings and Return Rollers at a minimum.
- f) Provide audible and visual warning signals along all areas of the system to make apparent any potential hazards to the public, operating and/or maintenance personnel resulting from moving or commencing to start equipment.
- g) Provide protection from falling objects in work areas or aisles located beneath overhead portions of the system with gap pans, netting etc.
- h) Locate conduits and all other electrical components where they shall not be subject to damage by maintenance or operational personnel.

1.14.4 Life Safety

- a) The BHS contractor shall be responsible for the coordination of all the "Egress Routes", with the Owner (or OAR). The BHS contractor shall supply all the necessary equipment to satisfy all the life safety requirements, including crossovers, ladders, stairs, lift gates and catwalks.
- b) All the safety measures shall protect the entire staff of the BHS from injuries. This also includes tug & dolly ram protection, work platforms and all the other areas of the BHS where only the maintenance staff has access.
- c) All the BHS safety measures shall be in accordance with the federal, state, and local OSHA requirements and/or any other applicable safety regulations. The BHS contractor is also fully responsible to incorporate into their design, any additional associated safety features and/or requirements.

1.14.5 Safety Signs and Graphics

- a) The BHS contractor shall provide and install all the required safety signs and graphics for the associated BHS equipment. All the BHS "Warning" and "Caution" signs shall be visible to personnel accessing and/or working within the baggage conveyor areas.
- b) The safety signs and graphics shall be pre-printed phenolic or metal signs, permanently mounted to the applicable BHS equipment, or on the walls or structures for which they are intended.
- c) The BHS contractor shall submit samples of the safety signs and graphics to be used for the Project. The Owner reserves the right to request additional signage and graphics for any associated personnel protection.
- d) At a minimum, the BHS safety and warning signs shall include but not limited to such items as:

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1. Conveyors Start Automatically
 2. Equipment May Start Without Warning
 3. Electrical Equipment – Authorized Personnel Only
 4. Danger – High Voltage
 5. Turn Off Power Before Opening
 6. Turn Off Power Before Working On Conveyor
 7. Do Not Operate With Guards or Doors Open
 8. Do Not Walk Under Conveyor
 9. Do Not Walk On Conveyor
 10. Keep Off Conveyor
 11. Caution - Low Overhead Clearance
 12. Caution - Overhead Conveyor
 13. Pinch Points
- e) General caution signs shall be located at the entrances to the BHS matrices or conveyor areas and shall include but not limited to such items as:
1. Only Authorized Personnel should operate conveyors
 2. Do not start conveyor without audible or visual warning, "All Clear"
 3. Know the locations and functions of E-Stops (Emergency Stops)
 4. Do not remove jammed baggage with conveyor running or power on
 5. Turn off power before working on conveyor
 6. Do not walk / ride / sit or climb on conveyor without turning off all associated power supplies
 7. Do not operate conveyors with guards or protective equipment removed
 8. Keep areas around conveyors clear of obstructions and debris
 9. Report all unsafe conditions and practices to your supervisor

1.14.6 BHS Contractor Requirements

a) Conditions

1. The BHS construction, alteration, and/or repair, (including painting and decorating), shall not require any laborer or mechanic (employed in the performance of the contract) to work in surroundings or under working conditions which are unsanitary, hazardous, or dangerous to their health or safety.

b) Accident Prevention

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1. It shall be the BHS contractor's responsibility to initiate and maintain accident prevention programs. The prevention programs shall provide for frequent and regular inspections of the job sites, materials, and equipment. If a particular standard is specifically applicable, it shall prevail over any different general standard practice.
 2. Safe off all openings in floors, ceilings and catwalks to prevent objects from falling.
 3. The use of any machine, tool, material, or equipment which is not in compliance with any applicable requirement is prohibited. Any defective machine, tool, or equipment shall be identified as unsafe by tagging or locking the controls to render them inoperable.
 4. The BHS contractor shall permit only authorized employees (with adequate training or experience) to operate equipment and machinery. The BHS contractor shall instruct each employee in the recognition and avoidance of unsafe conditions, and the regulations applicable to their work environment, to control or eliminate any hazards, or other exposure to illness or injury.
 5. The BHS contractor's employees handling or using poisons, or any other harmful substances shall be instructed as to the safe handling and use, and be made aware of the potential hazards, personal hygiene, and personal protective measures required.

PART 2. - BHS PRODUCTS

2.1 BHS ACCEPTABLE MANUFACTURERS

A minimum of five (5) years of demonstrable experience with similar systems (size and complexity) as a turnkey BHS contractor is required. The BHS equipment and components shall be in compliance with the Contract Drawings, documentation and this specification, and pre-qualified separately by the Owner (or OAR).

2.1.1 BHS Prime Contractors

The following firms are qualified to bid prime turnkey implementation and perform as Contractors and Integrators for the Baggage Handling System work on this Project:

- a) Daifuku / Jervis B. Webb Company, Farmington Hills, Michigan
- b) Siemens Parcel Post, DFW Airport, Texas
- c) Vanderlande Industries, Inc., Marietta, Georgia
- d) Five Star Airport Alliance (Horsley Co), SLC, UT
- e) Automatic Systems, Inc., Kansas City, MO
- f) Diversified Conveyors International, LLC (DCI), Memphis, TN
- g) Owner (or OAR) Approved Equal (prior to bid)

2.1.2 BHS Controls

The following firms are qualified to perform as BHS Controls subcontractors for this Project:

- a) Alliant Technologies, Louisville, KY
- b) CLX Engineering Sanford, FL
- c) Brock Solutions US, Inc., Irving TX
- d) Vanderlande Industries, Inc., Marietta, Georgia
- e) Daifuku / Jervis B. Webb Company, Farmington Hills, Michigan
- f) Control Touch, Inc., Louisville, KY
- g) Kasa Controls & Automation, Salina, KS
- h) Owner (or OAR) Approved Equal (prior to bid)

2.2 BHS ACCEPTABLE EQUIPMENT - MECHANICAL

NOTE: Consideration to the existing equipment shall be made when making the final vendor selection, to minimize the number of spare parts that must be stored on site.

2.2.1 Motors

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- a) Baldor (Reliance)
 - b) SEW Eurodrive
 - c) U.S. Motors
 - d) Nord Drive systems
 - e) Lenze
 - f) Owner (or OAR) Approved Equal

2.2.2 Brakes

- a) Baldor (Reliance)
- b) Stearns
- c) Warner
- d) EMTorq
- e) Owner (or OAR) Approved Equal

2.2.3 Bearings

- a) Dodge (Baldor Electric Company) ABHS series
- b) Sealmaster/Morse Industrial Corp.
- c) Owner (or OAR) Approved Equal

2.2.4 Belting

- a) Ammeraal Beltech
- b) Habasit Belting, LLC
- c) Siegling America, Inc.
- d) Owner (or OAR) Approved Equal

2.2.5 Reducers

- a) Dodge "TXT" ABHS
- b) Dodge Quantis
- c) SEW Eurodrive
- d) Nord Drivesystems
- e) Owner (or OAR) Approved Equal

2.2.6 Roller Chain

- a) Diamond Chain Company
- b) Morse Industrial
- c) Owner (or OAR) Approved Equal

2.2.7 Belt Conveyors

- a) Daifuku / Jervis B. Webb Company, Farmington Hills, Michigan
- b) Siemens Parcel Post, DWF Airport, Texas
- c) Vanderlande Industries, Inc., Marietta, Georgia
- d) Five Star Airport Alliance (Horsley Co), SLC, UT
- e) Automatic Systems, Inc., Kansas City, MO
- f) Owner (or OAR) Approved Equal (prior to bid)

2.2.8 Fire/Security Doors

- a) Cookson Company
- b) Vigneaux Corporation
- c) Raynor
- d) Cornell Iron Works
- e) Airport Equipment Specialists Inc.
- f) Owner (or OAR) Approved Equal

2.2.9 Draft Curtains

- a) TRAX Industrial Products
- b) Necor
- c) Owner (or OAR) Approved Equal

2.2.10 Queue Conveyors (positive tracked)

- a) Daifuku / Jervis B. Webb Company, Farmington Hills, Michigan
- b) Siemens Parcel Post, DWF Airport, Texas
- c) Vanderlande Industries, Inc., Marietta, Georgia
- d) Five Star Airport Alliance (Horsley Co), SLC, UT
- e) Automatic Systems, Inc., Kansas City, MO
- f) Owner (or OAR) Approved Equal (prior to bid)

2.2.11 Roller and Ball Conveyor

- a) Interroll
- b) Ashland Conveyor
- c) Owner (or OAR) Approved Equal

2.2.12 Slope Plate Conveyor

- a) Daifuku / Jervis B. Webb Company, Farmington Hills, Michigan

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- b) Siemens Parcel Post, DWF Airport, Texas
 - c) Five Star Airport Alliance (Horsley Co), SLC, UT
 - d) Owner (or OAR) Approved Equal (prior to bid)

2.2.13 Flat Plate Conveyor

- a) Daifuku / Jervis B. Webb Company, Farmington Hills, Michigan
- b) Siemens Parcel Post, DWF Airport, Texas
- c) Vanderlande Industries, Inc., Marietta, Georgia
- d) Five Star Airport Alliance (Horsley Co), SLC, UT
- e) Owner (or OAR) Approved Equal (prior to bid)

2.2.14 TSA Bag Inspection Stations (BIS) Acceptable Manufacturers

- a) Morcon Construction (Fisher Solutions)
- b) NACC Services
- c) Owner (or OAR) Approved Equal

2.3 BHS ACCEPTABLE EQUIPMENT - ELECTRICAL

2.3.1 MCP Cabinets

- a) Hoffman Engineering Co.
- b) Control Engineering Company
- c) EMF Company, Inc.
- d) Eaton
- e) Saginaw Control and Engineering
- f) Owner (or OAR) Approved Equal

2.3.2 PLC/IO Platform

- a) Allen-Bradley
- b) Owner (or OAR) Approved Equal

2.3.3 Motor Starters

- a) Allen-Bradley
- b) Schneider Electric
- c) Owner (or OAR) Approved Equal

2.3.4 Control Relays

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- a) Allen-Bradley
 - b) Schneider Electric
 - c) Eaton/Cutler Hammer
 - d) Owner (or OAR) Approved Equal
- 2.3.5 Circuit Breakers
- a) Allen-Bradley
 - b) Eaton/Cutler Hammer Schneider Electric
 - c) Owner (or OAR) Approved Equal
- 2.3.6 Fuses and Fuse blocks
- a) Littelfuse
 - b) Bussman
 - c) Owner (or OAR) Approved Equal
- 2.3.7 Hour Meters
- a) Hobbs Corporation
 - b) ENM Company
 - c) Owner (or OAR) Approved Equal
- 2.3.8 Programmable Logic Controllers
- a) Allen-Bradley
 - b) Siemens
 - c) Owner (or OAR) Approved Equal
- 2.3.9 MCP Mounted Touchscreen PCs
- a) Allen-Bradley
 - b) Siemens
 - c) Owner (or OAR) Approved Equal
- 2.3.10 Photo Electric Cells (Photo-eyes)
- a) Allen-Bradley
 - b) Photocraft
 - c) Schneider Electric
 - d) Owner (or OAR) Approved Equal
- 2.3.11 Signaling/Alarms
- a) Allen Bradley

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- b) Edwards
 - c) Federal
 - d) Mallory (Sonalert)
 - e) Owner (or OAR) Approved Equal

2.3.12 Variable Frequency Drives

- a) Allen Bradley
- b) SEW Eurodrive
- c) Lenze
- d) Siemens
- e) Schneider Electric
- f) Nord Drivesystems
- g) Owner (or OAR) Approved Equal

2.3.13 Control Transformers

- a) Acme
- b) Allen Bradley
- c) General Electric
- d) Owner (or OAR) Approved Equal

2.3.14 Control Stations

- a) Hoffman
- b) Allen Bradley Type 800T
- c) Saginaw Control and Engineering
- d) Owner (or OAR) Approved Equal

2.3.15 Switches and Pushbuttons (30.5MM)

- a) Allen Bradley Type 800T (LED)
- b) Owner (or OAR) Approved Equal

2.3.16 Motor Safety Disconnects

- a) Allen Bradley
- b) General Electric
- c) Square-D
- d) Cutler-Hammer
- e) Westinghouse

f) Owner (or OAR) Approved Equal

2.3.17 Liquid Tight / Flexible Conduit

- a) Anaconda
- b) Sealtite
- c) EF liquid tight
- d) Owner (or OAR) Approved Equal

2.3.18 Uninterruptable Power Supplies

- a) APC
- b) Owner (or OAR) Approved Equal

2.3.19 Network Switches

- a) Cisco Systems, Inc.
- b) Owner (or OAR) Approved Equal

2.4 BAG LOADING INSTRUCTIONS

2.4.1 Odd Size / Oversize

The following is a list of typical items that shall be handled via the oversize process and not inserted into the baggage handling system:

1. Hand Trucks
2. Dollies
3. Toolboxes
4. Heavy items
5. Items that may separate
6. Hockey sticks
7. Tennis rackets
8. Boogie boards
9. Lawn chairs
10. Low profile objects
11. Umbrellas
12. Strollers
13. Coolers

2.4.2 Special Note

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- a) Travelers may only transport "UNLOADED" firearms in a locked, hard-sided container in or as checked baggage.
 - b) All firearms, ammunition and firearm parts, including firearm frames and receivers, are prohibited in carry-on baggage.
 - c) Realistic replicas of firearms are also prohibited in carry-on bags and must be packed in checked baggage.
 - d) Rifle scopes are permitted in carry-on and checked bags.

2.4.3 Special Instructions for Screening Inputs

The following instructions must be used when introducing baggage into the inline screening system:

- a) Tubs - Tubs shall be used for any small and/or lightweight bags. Tubs shall be used for any "round" bags that shall fit in a tub. The tub size shall be coordinated with the Owner. Extremely overstuffed bags shall roll on the system and shall be placed in a tub.
- b) Wheels - Bags with wheels shall be inserted wheels up.
- c) Car Seats - Car Seats shall be placed face down with the top of the car seat pointing in the direction the conveyor is travelling.
- d) Golf bags - Golf bags that measure less than 54" in length are acceptable in the inline screening system. Bag tags shall be placed on the center handle.
- e) Straps - Straps can get caught in the baggage system and shall be removed or tucked inside the bags prior to loading on the system.
- f) Old Tags - Be sure to remove old IATA and/or Pier Tags from other stations.

2.5 BHS CONVEYORS AND EQUIPMENT

2.5.1 Equipment

- a) The BHS conveyors and equipment shall be numbered in consecutive order, in a manner that is consistent with the system / subsystem identification, (detailed on the contract documents). Numbers shall increase as travelling downstream. Naming conventions shall follow PGDS's most current version.
- b) The BHS contractor shall provide identical types of equipment to minimize the spare parts requirements, (wherever functional or practical).
- c) The BHS contractor shall design, provide and install the belt conveyor systems, (including all the required supports for the associated conveyor sections). The BHS contractor shall select the associated equipment (including supports) to minimize noise and vibration.

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- d) The BHS contractor shall securely fasten each floor or overhead support to the ceiling overhead beams, or to the floor by methods approved by the Owner (or OAR).

2.5.2 Standard Clearances and Configuration

- a) All BHS conveyors shall be designed and installed to have a minimum of 36 inch baggage clearance, (above the conveying surface). The BHS contractor shall identify any areas where this clearance cannot be provided, (during the preliminary design stage).
- b) Conveyor Clearances:
 - 1. A minimum of 12" from motors, drive units and bearings to fixed obstructions such as walls, beams and columns.
 - 2. A minimum of 24" clearance between conveyor guards for adjacent conveyors.
 - 3. BHS contractor shall maintain the manufacturer's recommended clearance for access and maintenance for other equipment (as outlined in their respective integration guidelines).
 - 4. All applicable BHS equipment, conveyors, and associated components shall have a minimum underside clearance of 7'-6" from the bottom of the support structure to the floor in tug or other traffic areas and have a minimum underside clearance of 6'-8" from the bottom of the support structure to the floor in personnel egress areas.
- c) For BHS conveyors transporting normal sized baggage, the maximum angles on inclines and declines shall not exceed 12 degrees in tracked areas and 18 degrees (not to exceed existing) in untracked areas, from the horizontal, (unless indicated otherwise on the Contract Drawings). The BHS contractor shall promptly notify the Owner (or OAR) where the slope shall be exceeded and/or the minimum clearances cannot be provided.
- d) The BHS contractor shall conduct a field survey of all the conveyor paths and right-of-ways (prior to the submission of the design, installation and/or assembly drawings).

2.5.3 Baggage Characteristics

- 2.5.3.1 Types of Baggage. The type of baggage which the BHS shall convey can be classified as follows:
 - a) Normal baggage: Those items which can be processed by the conveyor system without special handling. The following defines the physical dimensions of normal baggage:

	Length	Width	Height	Weight
Max.	54"	30"	36"	120 lbs.
Min.	12"	12"	4"	5 lbs.

- b) Odd-sized: In addition to dimensional and weight restrictions, items being checked shall be in suitable condition to travel through the system safely and securely without causing jams or interruption to the operation of the system's hardware.
 1. Baggage and objects which would be unstable on the conveyor shall be placed in low profile tubs before induction into the system.
 2. Car seats, garment bags or similar soft sided bags, as well as items with loose straps, strings, ropes or hooks also fall into this category. All such bags shall be laid down in tubs.
- c) Over-sized: Items are considered "Over-sized" if they exceed any of the maximum dimensions listed above, and also is considered to include items such as animal cages, skis, fishing poles, map cases, etc. (which cannot be handled by the BHS). Oversized items shall be manually handled by airport and screening personnel.

2.5.3.2 Tubs

- a) Bag tubs should be used for any item that is irregular in shape or does not have at least one flat surface and will have a tendency to roll around or move while being transported on a conveyor. A final definition of the tubing policy shall be provided by the contractor prior to testing.
- b) The tubs used for testing shall be provided by the Owner (or OAR). Coordinate testing requirements with the Owner (or OAR).
- c) The tubs shall be large enough to accommodate a car seat.
- d) The initial purchase of tubs shall be coordinated with the Owner (or OAR). For estimation purposes, approximately 200 tubs shall be provided initially by the contractor.

2.5.4 Design Loads and Rates

- a) All BHS transport belt conveyors shall be designed for a live load of 40 lbs/ft (linear ft) at a belt speed of 90 fpm (adjusted to reflect speed variations and throughput). For calculating the required load of transport conveyors, use formula: $40 \text{ lbs/ft} \times (90 \text{ FPM} / \text{actual conveyor speed}) \times (\text{throughput rate} / 25 \text{ bags/min}) = \text{required lbs/ft}$. The minimum load on any baggage conveyor (after speed and throughput are considered) shall be 25 lbs/ft.
- b) Conveyors shall have fixed live load requirement to be used during load testing as follows:

1. BHS transport belt conveyors shall adhere to the calculated live load value previously described.
 2. BHS load, unload, and accumulating belt conveyors operating up to 120 ft/min shall be designed to convey a live load of 60 lbs/ft.
 3. Slope plate conveyors shall be designed to convey a live load of 70 lbs/ ft.
 4. Flat plate conveyors shall be designed to convey a live load of 70 lbs/ ft.
- c) A subset of typical operating design rates, speeds and loads are shown in the table below:

Subsystem	Throughput bags/min	Speed ft/min	Load lbs/ft
Ticket Counter Load Belt	25 bpm	90 fpm	60 lbs/ft
Main Line Transport Belt Conveyor	60 bpm	240 fpm ⁽¹⁾	36 lbs/ft
Sortation Belt Conveyor	60 bpm	270 fpm ⁽¹⁾	32 lbs/ft
Slope Plate Conveyor	25 bpm	90 fpm	125 lbs/ft
Flat Plate Conveyor	25 bpm	90 fpm	85 lbs/ft
Inbound Transport Belt Conveyor	30 bpm	120 fpm ⁽¹⁾	36 lbs/ft
Manual Encoding Belt Conveyor	15 bpm	90 fpm	40 lbs/ft

⁽¹⁾ Shown for example, final speeds for transport conveyors shall be determined as part of the design process based on bag flow, throughput, equipment requirements etc.

- d) The BHS Static Load Rating for any conveyor shall be 250 pounds of concentrated load.
- e) The "Coefficient of Friction" between belt and slider bed shall be determined by the belt manufacturer's recommendation and used in calculating the horsepower. All BHS conveyor drives shall be sized so that starts can be made under full load conditions.
- f) Live load shall also be reflective of the bags per minute (BPM) rate. For example, if two lines of equal rate are merged together the new load shall reflect twice the single line load.

2.5.5 Dependability

- a) The BHS conveyors and associated equipment shall operate reliably and be reasonably free of breakdowns. The design of the components within the BHS shall provide for ease of maintenance, replacement accessibility, and service requirements.
- b) All BHS mechanical components shall operate satisfactorily within a temperature range of 20 degrees F to 140 degrees F, with a relative humidity of 0 to 100 percent (non-condensing)

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- c) The BHS shall be capable of continuous operation, (20 hours a day, 7 days a week, and 365 days a year), with provisions for routine preventative maintenance, as specified in the "O&M" manual.

2.5.6 Maintainability

- a) The BHS equipment components that require inspection and servicing shall be readily accessible.
 - 1. Either suitable access doors or removable enclosures shall be provided and installed for these purposes (as shown on the drawings).
 - 2. Either maintenance access holes in conveyor frames or guards are acceptable, (but shall be held to a minimum number and size). Access holes shall not create protrusions or discontinuities that are damaging to the BHS equipment and/or to the baggage being conveyed.
- b) All the BHS assemblies and components shall be easily disconnected and removed from the associated equipment without the necessity for extensive disassembly.
 - 1. All BHS assemblies and components shall be designed for removal and replacement by two (2) people in a period not to exceed two (2) hours.
 - 2. The Owner (or OAR) reserves the right to request a demonstration of the replacement of an item, during the O&M training session.

2.5.7 Preventive Maintenance

- a) The BHS may be shut down for routine or Preventive Maintenance (PM) during non-operational hours. Portions of the baggage screening matrix may be shut down during low volume periods.
- b) The system shall be so designed that no scheduled preventive maintenance task requires more than two (2) hours of full system shutdown, or four (4) hours of reduced operations, or any combination of both in excess of four (4) hours.
 - 1. All components and subsystems shall be designed for replacement within this period.
 - 2. All components and assemblies shall be easily disconnected and removed from the equipment without requiring extensive disassembly.

2.5.8 Speeds

- a) The BHS conveyor speeds that are indicated on the Contract Drawings are for reference only. The actual BHS conveyor speeds shall be determined by the BHS contractor, in accordance with good design practice and system throughput requirements. BHS conveyor speed increases or decreases shall not exceed 30 FPM. Coordinate speeds at all interface locations to existing conveyors and conveyors associated with other projects if applicable.

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- b) The BHS shall be capable of transporting all associated checked baggage from the furthest input point to the furthest output point within a predetermined time period. The BHS shall transport the baggage smoothly and effectively without causing the bags to slip, slide, snag, tumble, or roll.
 - c) Typical speeds, unless otherwise defined shall be:
 - 1. Load/Unload – 120 ft/min
 - 2. Slope Plate/Makeup/Claim – 90 ft/min (120 ft/min max for make ups)
 - 3. Transport – Varies by design (below 240 ft/min preferred)
 - 4. Merges – equal to or greater than the take-away

2.5.9 Vibration

- a) The BHS contractor shall provide shaft mounted components (pulleys, sprockets, etc.) and other components subjected to vibration with some means of preventing loosening of the component such as snap rings, cotter pins, or other methods approved by the Owner (or OAR).
- b) Mount all conveyor components that are supported from structural elements adjoining public and/or office space on vibration isolation pads (or hangers) to eliminate perceivable vibration from being transmitted to the building.
- c) BHS conveyors and components that are attached to header steel, (surface mounted to building elements and/or mezzanines) shall not transmit any vibration. Such items shall be fitted with vibration isolators (to eliminate vibration), at no cost to the Owner.
- d) Vibration isolators may be specified elsewhere in this document (above those minimally required), reducing sound levels and perceivable vibration. Exception: Spring type vibration isolation may not be used to support Merges.
- e) The conveyor systems that are designed and installed by the BHS contractor shall not produce or induce objectionable vibrations into the building structure. The vibration levels that are induced by the BHS and/or its components shall not be injurious to the system, or the building structure, or be harmful or annoying to the passengers and/or employees. The BHS contractor shall provide and install any necessary vibration isolation devices (or techniques) required to meet this requirement.

2.5.10 Ancillary Items

- a) It shall be the BHS contractor's responsibility to coordinate the design of the baggage conveyors and its ancillaries with all attachments and hardware, including but not limited to:
 - 1. Impact protection
 - 2. Safety guards and signage

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3. Draft curtains
 4. Associated devices and components
- b) BHS gap pans shall be provided and installed on all the conveyor-to-conveyor transfer points. Gap pans shall be not less than 12 gauge sheet metal with a minimum of one (1) inch high sides on the edges. The gap pans shall be easily removed and installed and shall also have smooth edges.
 - c) Designated pathways shall be assigned for larger maintenance equipment to be transported. Methods to provide this pathway may be provided by the following means:
 1. The use of a crane to move equipment is allowable with Owner (or OAR) approval.

2.5.11 General Drive Requirements

- a) The BHS conveyor drives shall be located near the head end of the conveyor (where clearance permits). Exception: Reversing conveyors shall have the drive located near the middle of the conveyor.
- b) All BHS drive units utilizing V-belts and sheaves shall be equipped with suitable guards of "Clamshell" design with quick-release fasteners and shall be fabricated from 16-gauge steel (at a minimum).
- c) All drive guards shall comply with the applicable "OSHA" standards and shall be provided with an expanded or slotted metal viewing port, to allow for belt inspection (without removing the guard). All drive guards shall be painted OSHA #1016 or #1026 "Safety Yellow".
- d) All BHS conveyor drive motors and/or reducers shall be provided with adequately sized drip pans. The drip pans shall be easily removed and installed and shall also have smooth edges.
- e) The BHS conveyor drive sprockets and/or V-belt sheaves shall be provided with a taper-lock type hub construction, (with keyways). The associated sprockets shall be steel, with a minimum of thirteen (13) "Type B" form teeth.
- f) The BHS conveyor drive sheaves shall be "two-groove", A-section pulleys, with taper-lock type hubs (at a minimum). All the pulley assemblies that are four (4) inches or greater in diameter shall use taper-lock hubs and bushings.
- g) The roller chain provided for BHS equipment shall be compatible with the torque and horsepower requirements, (but not less than RC-60 in size). The roller chain ends shall be connected with a removable "master link".
- h) All of the BHS lubrication points and "zerk style" grease fittings shall be easily accessible from the maintenance platform or designated maintenance access location.

2.5.12 Motors

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- a) The BHS conveyors shall be driven by copper wound AC induction motors, (minimum NEMA-B rated), except for crescent plate and slope plate devices, (which shall have a minimum NEMA-C motors).
 - b) The BHS motors shall be sized for the maximum load and belt speed requirements under continuous operation with a minimum of two (2) HP, and a maximum of seven and a half (7.5) HP. Any BHS motor sizes that vary from the sizes stated on the installation drawings shall require the approval of the Owner (or OAR), prior to installation.
 - c) All BHS motors shall be Totally Enclosed Fan Cooled (TEFC) and shall be provided with the appropriate overload protection, (in the associated motor control panel).
 - d) The motors shall be constant speed (1800 RPM), continuous service, and ball-bearing type, with a minimum of class "B" insulation. The service factor on BHS motors shall be a minimum of 1.15.
 - e) Where applicable, the motors shall be capable of withstanding shock caused by frequent starting and stopping (under full load conditions). The BHS motor sizing shall permit a minimum of 20% speed increase (on any baggage conveyor), without changing to larger motors.
 - f) If BHS conveyor overrun is critical to the system control operation, then the motors shall be equipped with automatically applied brakes, to prevent overrun, (after the motors are de-energized). The BHS motors that are used on inclines or declines (where rollback would be critical) shall be equipped with brake motors. The braking mechanism (solenoid) shall engage the brake upon the removal of power to the motor. The stopping torque shall be equal to (or greater than) the starting torque of the motor.
 - g) The BHS motors that are used in tracked areas and on indexing belts (including merges or other belts with frequent Start/Stop operations) shall be controlled by a Variable Frequency Device (VFD). Indexing conveyor drives shall be capable of a minimum of 30 continuous Start/Stop cycles per minute (when fully loaded).

2.5.13 Reducers

- a) The BHS reducers shall be shaft-mounted where adequate clearance and maintenance access exists. In applications where physical space is limited, powered pulleys may be substituted.
- b) All BHS reducers shall be sized for Class II application and shall have a service factor based on a L10 life of 70,000 hours.
- c) All BHS chain drives, belts, and rotating shafts shall be equipped with protective guards. All the associated protective guards shall be painted OSHA #1016 or #1026 "Safety Yellow".

2.5.14 Pulley Assemblies

2.5.14.1 Drives

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- a) The BHS power pulleys used for end-type drives or power take-offs shall be lagged with (a minimum of) 3/8 inch thick "vulcanized lagging" of 55-70 durometer and shall be 6 3/4 inch in diameter crown faced (at a minimum), and equipped with taper-lock type hubs, and 1-7/16 inch (minimum) diameter.
 - 1. The pulleys shall be designed to and in compliance with AISI 1018 steel and be in accordance with CEMA standard No. 402-1992 (as revised).
 - 2. Shafts shall be mounted in precision-and-ground flange-type ball bearing units.
 - b) The pulleys and shafts sizes are determined by the maximum belt pull as follows:
 - 1. Light-duty: (300 pounds maximum belt pull) shall consist of a 6-3/4 inch (minimum) diameter drive pulley, with a 1-7/16 inch (minimum) diameter shaft. Where used, the roller chain shall be RC-60.
 - 2. Normal-duty: (500 pounds maximum belt pull) shall consist of an 8-3/4 inch (minimum) diameter drive pulley, with 1-11/16 inch (minimum) diameter shaft. Where used, the roller chain shall be RC-60 or larger.
 - 3. Intermediate-Duty: (1,000 pounds maximum belt pull) shall consist of 10-3/4inch (minimum) diameter drive pulley, with a 1-15/16 inch (minimum) diameter shaft. Where used, the roller chain shall be RC-80 or larger.
 - 4. Heavy-duty: (1,500 pounds maximum belt pull) consists of 12-3/4 inch (minimum) diameter drive pulley, with a 2-3/16 inch (minimum) diameter shaft. Where used, the roller chain shall be RC-80 or larger.
 - c) BHS end-type drive units may be used for conveyors 25 feet or less in length. Associated crown-faced pulleys shall be tapered at (a minimum of) 1/8 inch per foot, from the center.
 - d) BHS drive pulleys shall be easily removable, without the disassembly of the drive frame unit, (preferably through the end plate).
 - e) All the associated power pulleys and shaft assemblies shall have a concentricity of 0.02 inch TIR (minimum).
 - f) The belt arrangement at the conveyor drive unit shall be routed so that the "tight side" of the belt passes over and around the drive roller, prior to the belt wrapping around the take-up pulley. Belt wrap around the conveyor drive roller shall be greater than 210 degrees.

2.5.14.2 Take-ups

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- a) All the BHS take-up pulleys shall be (a minimum of) four (4) inches in diameter, steel, crown-faced, and equipped with taper-lock type hubs, and shall be 1-7/16 inch (minimum) diameter.
 - 1. These take-up pulleys are designed to (and in compliance with) AISI 1018 steel, and in accordance with CEMA standard No. 402-1992 (as revised).
 - 2. Shafts are mounted in precision-and-ground flange-type (with grease fittings) outboard ball bearing units.
 - b) BHS pulleys shall be mounted on threaded take-up devices with steel guides. The BHS conveyors shall be provided with take-ups for field adjustments of at least four (4) inches, or 2 % of the conveyor bed length, (whichever is greater). Take-ups that are provided shall be an integral part of the drive frames on all the intermediate-drive conveyors.
 - c) The associated take-up pulleys and shaft assemblies shall have a concentricity of 0.05 inch TIR/inch of shaft length (measured from the pulley hub). The pulleys shall be dynamically balanced, and aligned for straightness, and have a (maximum) Total Indicated Runout (TIR) of 0.02 inches.
 - d) All the BHS conveyor sections that are in excess of 50 feet in length (subject to extreme temperature and humidity changes) shall be equipped with automatic take-up devices.
 - e) The BHS contractor shall adjust the position of all the take-up pulley devices after the system testing (prior to Substantial Completion) of the system, so that no more than 25% of the take-up device adjustment has been used.

2.5.14.3 Head and Tail Pulleys

- a) The non-powered BHS head and tail pulleys shall be 4" OD steel, crown-faced, equipped with taper-lock type hubs with a shaft of 1-7/16 inch (minimum) diameter.
 - 1. These pulleys are designed to (and in compliance with) AISI 1018 steel, and in accordance with CEMA standard No. 402-1992 (as revised),
 - 2. Shafts are mounted in precision-and-ground flange-type ball bearing units.
- b) The BHS head and tail drive pulley shall be six (6) inch in diameter, with a (minimum) #10 gauge wall.
 - 1. These pulleys shall be of a single piece steel construction and have steel discs attached to the rim, by continuous welding.

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2. The associated slider bed shall be arranged to keep the gap between the end section and the end pulley to a minimum.
 - c) The BHS head and tail pulleys that are used for belt tracking shall be equipped with jacking bolts (to facilitate adjustment).
 1. The BHS head and tail pulleys and the shaft assemblies shall have a concentricity of 0.02 inch Total Indicated Run-out (TIR) minimum.
 2. The shaft run out of each assembly shall not exceed 0.02 inch TIR/inch of shaft length (measured from the pulley hub).
 3. The jacking bolts used to adjust the tracking shall have a minimum of 50% adjustment remaining after the belt has been tracked.
 - d) All other BHS conveyor head and tail pulleys (for units not covered above) shall be the same as described under Power Pulleys. The BHS conveyors may be driven by a power pulley in the head end pulley location if the length is less than 25 feet.

2.5.15 Bearings

- a) The BHS bearings shall be pre-lubricated, sealed for life, self-aligning and anti-friction.
 1. The associated bearings shall have a minimum L-10 life of 70,000 hours (based on the service and loading of conveyors, and on the manufacturer's published data).
 2. All of the exposed bearings in the BHS work areas, (and/or meet minimum OSHA enclosure requirements) for personnel safety. The bearing covers shall be painted OSHA #1016 or #1026 "Safety Yellow".
 3. All the associated bearings shall be surface-mounted flange bearings that are attached to the outside of the conveyor bed, (unless otherwise specified).

2.5.16 Conveyor Bed Frames

- a) The BHS conveyor bed frames shall be reinforced with a minimum of 1/8-inch thick steel, in the area of attachment of the motor/gear reducer assembly.
 1. The BHS conveyor beds shall provide a low-friction sliding surface for the conveyor belts. All BHS conveyor joints shall be smooth, with no protruding rough or sharp edges on the fasteners, corners, joints or seams that could cause injury to personnel, damage to the baggage or bag tags, or could cause the system to jam.
 2. All of the edges shall be formed, 90 degrees, (turned away from the conveyor) and exposed edges shall be smooth and without burrs. The outside edge of all the floor mounted BHS conveyor sections shall have smooth, continuous surfaces (with no sharp edges).

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- b) The BHS conveyor bed lengths (noted on the drawings) are approximate. The BHS installer shall field-cut the associated conveyors to the exact lengths (where required). The total conveyor bed length shall be in components of 10 foot (maximum) bed sections that bolt together. Each BHS conveyor shall not exceed a maximum of fifty (50') feet in length.
 - c) Conveyor "break-over" sections shall have a minimum of 5'-0" radius break-over; (10'-0" radius break-over shall be used wherever possible). For conveyor return belt idling, the vertical bends shall be equipped with a standard four (4) inch snub roller.
 - d) Smooth transitions on the standard break-over sections shall be utilized for the following:
 - 1. Transitions from horizontal to downward slope
 - 2. Transitions from upward slope to horizontal to downward slope
 - 3. Transitions from upward slope to horizontal
 - e) The BHS conveyor identification numbers shall be neatly painted onto the corresponding conveyor sideguard, (adjacent to the motor). Each conveyor identification number shall be carefully and neatly painted white, (4" in height). The BHS conveyor I.D. shall be as shown on the approved shop drawings.

2.5.17 Side Guards

- a) The BHS conveyor side guards shall be a minimum of #11 gauge HRS, (integral to the slider bed), with a formed 90 degree turned away from the conveyor, and with a formed 90 degree edge turned down (to eliminate sharp edges). All side guard edges that are exposed to personnel as part of baggage jam clearance shall be provided with self-adhesive vinyl edge guards.
- b) All the BHS side guards shall provide a continuous, uninterrupted surface. All the joints between the conveyor bed sections shall be smooth (to insure a non-snagging surface).
- c) The side guards that are mounted adjacent to power turns shall be in alignment with the effective belt width of the turn.
- d) The conveyor side guards shall be reinforced with 1-1/4 inch x 1-1/4 inch x 3/16 inch vertical angle stiffeners, at not more than three (3) feet four (4) inch centers (on transport conveyors), and not more than two (2) feet six (6) inch centers (on load conveyors). The baggage conveyor side guard height shall be twelve (12) inches in industrial areas, and twenty-one (21) inches when located over public areas (unless noted on the drawings). BHS conveyor side guards of different heights shall have thirty (30) degree transition panels.
- e) The BHS side guards that are used in exterior applications shall be galvanized, (with G-90 coating). Note: The coating may be substituted with an industrial grade "epoxy coating" (rust inhibitive) and painted to match the conveyor frame.

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- f) The BHS contractor shall take special care in manufacturing and installation to insure smooth, snag-free butt joints without the use of "epoxy fillers". The BHS contractor shall apply "epoxy fillers" only on an exception basis, (i.e. where the joint cannot be otherwise aligned by using the acceptable methods).
 - g) If the BHS conveyor side guards are not an integral part of the frame and are attached separately, adhere to the following:
 - 1. The side guards shall be secured to the frame at (a maximum of) 1.5 inches on each side of the stiffeners, and at (a minimum of) one point midway between the stiffeners.
 - 2. The BHS contractor shall bolt all the conveyor side guards together at a maximum of six (6) inch vertical spacing.
 - h) The BHS contractor shall provide holes for the Photo-eyes and corresponding reflectors that are 1-1/2" diameter. The holes shall be "punched" (not burned), in the metal side guards in such a way that the dimple is pointed outward.
 - i) All holes in conveyor side guards that are not used shall be closed by welding a blank metal disk of the same gauge steel, ground flush on both sides of the guard and painted with matching paint.

Note: The baggage conveyor slider beds shall be unpainted, unless they are powder coated.

- j) Unless noted otherwise on the drawings, typical side guard heights shall be as follows:
 - 1. Check-in load belt back guards shall be 21"
 - 2. Power turns (flat) shall be 21"
 - 3. Power turns (spiral) shall be 21"
 - 4. Transport conveyors shall be 12" in industrial areas
 - 5. Incline and decline conveyors shall be 21"
 - 6. Decline fed power turns (flat or spiral) shall be 21"
 - 7. All conveyors located over public areas shall have 21" side guards

2.5.18 Belting

- a) BHS belting shall be no less wide than the distance "Between side Guards" (BG) minus three (-3) inches. The belting shall be flame retardant and in accordance with ISO 340, ASTM D-378, DIN 22103 and NFT- 47108 or equal.
 - 1. All conveyor belting shall have a minimum working tension of 100 pounds per inch.
 - 2. For incline and decline conveyors greater than seven (7) degrees, use bare by rough top or longitudinal rough top.

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3. BHS belting in public areas shall be "smooth top" (PVC X FS) type.
 4. Queue belting shall be Longitudinal Groove (LG) except queues with static deflectors, (which shall have "smooth top" belts).
- b) All BHS belt lacing shall be Clipper type #2 or #1 (size based on belt manufacturer's specification). Belt lacing shall be installed to prevent any damage to the belt, clipper or lacing.

2.5.19 Stainless Steel Trim

- a) The BHS contractor shall provide stainless steel shrouding and stainless steel hardware, on all baggage conveyors that are located in public areas and/or conveyors that are visible to the public.
1. The BHS stainless steel used for this Project shall be Type 304, 12 gauge, with #4 brushed finished.
 2. The BHS trim shall be fabricated from single sheets of stainless steel material without any open space between the joints.
 3. All the joints are to be shop welded, ground smooth, and polished to match the untouched adjacent surfaces.
 4. Countersunk stainless steel fasteners are required in all public areas.

2.5.20 Draft Curtains

- a) The BHS draft curtains shall be provided at the corresponding wall and floor penetrations, that separate air conditioned and non-air-conditioned spaces.
1. The draft curtains shall be flexible strips with two staggered layers of six (6) inch (minimum) wide x 1/8 inch thick, "black" vinyl strips.
 2. In the public areas, the vinyl strips shall be attached to the stainless steel angle, Type 304, 12 gauge (#4 brush finish).

2.5.21 Fire/Security Doors

- a) The BHS contractor is responsible for the design, interface with BHS system, acquirement, controls, power, installation and commissioning of the electrically operated, automatic closing fire/security doors at all fire rated openings as indicated on associated drawings. Any relocated doors shall be tested as if they are newly installed. Fire/security doors shall provide at a minimum the following:
1. Fire door U.L rating shall meet or exceed the fire rating of the partition wall to which it is mounted (1.5hr, 2hr, 3hr, etc.). The door shall be certified and correctly U.L. labeled by the manufacturer for the required rating. Verify the required fire rating with the proper governing authority for all fire doors in the scope of this contract.
 2. Contractor shall be responsible for electrical wiring, conduit, sensors, disconnect switches, connection of the operator to the power supply, the

installation and connection of control stations, and the interface connections to associated building alarm systems.

3. A 165° F fusible link shall be provided, which shall cause the fire/security door to automatically gravity close.
4. The fire/security doors shall be provided by the manufacturer with the electrical operator and a 480 VAC, 3 phase, 60 hertz motor. Door operator enclosures and electrical devices shall be NEMA/IEC rated for the environment that it is installed.
5. A control station and motor safety disconnect shall be provided for each powered fire/security door. These devices shall meet the same requirements as defined for the BHS system in this specification at a minimum and rated for environment in which they are installed as required by electrical codes.
6. Sensors connected to the PLC inputs, shall be externally mounted to detect the "full open" and "fully closed" position of the door. The associated conveyors shall stop running if the door is not in the "full open" position. These devices are in addition to internal sensors supplied with the door.
7. An internal sensor shall be installed at the bottom edge of the door for detecting a bag below the door edge. In addition, an external photo sensor connected to the PLC inputs shall be provided for detecting an obstruction below door.
8. Doors shall be equipped with a failsafe releasing device that allows doors to be gravity closed in the event of a signal from the fire alarm system, gravity drop or loss of power. Releasing mechanism will automatically reset upon resumption after a fire alarm state or resumption of power. No re-calibration or special actions shall be required following gravity fire closure.
9. The BHS contractor shall provide the interface wiring between the BHS MCP and the building central fire and security systems. Contractor shall be responsible for coordinating and provide all required signals between the BHS control system panels, the building fire system and the building security system, including conduit and wiring. Contractor is responsible for coordinating fire zoning (if applicable) and performing the necessary shut down responses to building fire system conditions.
10. The BHS contractor shall coordinate the installation and framing, (including the required steel trim), with the Owner (or OAR). For fire/security doors in the public view, the BHS contractor shall provide the Type 304, minimum 22 gauge, #4 brush finish stainless steel doors and trim as coordinated with the Owner (or OAR).
11. The fire/security doors provided shall have the ability to be manually operated (manual release and pull chain or crank). Manual chain or crank

operators shall be located on the door operator side, safely separated from conveyor and door operating parts.

12. All operable parts, such as drive systems and trackways, shall be provided with removable safety guards.
13. Gapping between conveyors shall not exceed 3" where doors close between conveyors.
14. Fire/security shutters may be used in place of doors in tunnels or spaces where overhead height is restricted. Shutters must comply with the door specifications listed in this document with the exceptions of wind load ratings and continuous duty ratings. Shutters cannot be used in any opening exposed to outdoor winds or on 4 hour fire rated walls. Shutters are limited to 6-8 cycles per hour.

2.5.22 Queue Conveyors

- a) The BHS queue conveyors shall be constructed of at least #11 gauge steel, with an integral bed and stiffeners. The queue belt shall be fabricated with a longitudinal "high-friction" top surface to allow minimal bag slippage, on conveyor stopping and starting.
- b) The queue conveyors shall be "self-tracking" units, utilizing slider bed type construction. The motor shall be (a minimum of) two (2) HP @ 1800 Revolutions Per Minute (RPM). The associated drive shall be sized with (a minimum of) 1.15 service factor and shall be capable of 30 cycles (Start/Stop) per minute.
- c) The associated pulleys shall be mounted in externally mounted ball bearings, and adjustable by means of jack screws (to allow for proper positioning and tensioning).
- d) The queue bed shall be designed with guide slots, (on the outer edges), for belt tracking. The guide slots shall be centered at a maximum of one (1) 1/2 inch from the edge of the slider bed and include a lead in taper (to assist the belt attachment guides into the bed guides). The queue belting shall have guides attached to the bottom of the belt that shall align with, and travel through, the conveyor bed guide slots.
- e) The width of the end rollers, drive rollers, snub rollers, etc. shall be sized (as required) so they are between the belt bushings, and do not interfere with the travel of the belt.

2.5.23 Slope Plate Device

2.5.23.1 General

- a) Incline plate/slope pallet devices shall be constructed of articulating contoured pallets or flights forming a continuous, rotating, sloped surface. They shall be arranged to receive baggage from a feed conveyor(s) at a

point on the inside rim as shown on the contract drawings. The unit shall be automatically fed via belt conveyor(s).

- b) The BHS Contractor as part of the bid proposal can submit their standard incline plate/slope pallet device specifications for review. Final approval of the qualified manufacturer shall be at the discretion of the Owner (or OAR). The design, manufacture, and installation of the incline plate or slope pallet device shall conform to all sections of this specification as is appropriate.
- c) The height of incline/slope pallet devices shall be as follows unless otherwise specified by the Owner (or OAR) or shown on the Contract Drawings: 16" +/-2" for Claim devices and 30" +/-2" for Makeup devices.
- d) All incline/slope pallet devices shall be capable of supporting a minimum dynamic load of 125 pounds per linear foot.
- e) The device operating speed for incline/slope pallet devices shall be 90 fpm. The feed belt conveyor operating speed to incline/slope pallet devices shall be 120 fpm.
- f) Incline/slope pallet devices shall be capable of accepting baggage per each in-feed conveyor at a rate of twenty-five (25) bags per minute.
- g) In conformance with OSHA standards all designs typical for baggage pick up and located within common areas include a physical barrier "bag stop" located on the exterior of the unit at the delivery belt entry point.
- h) Provide a deflector guard for any fixed object, such as a column, that is 1'-0" or closer to the side of the slope plate outer periphery to prevent overhanging bags from being knocked off the unit.

2.5.23.2 Drives

- a) Chain drives and friction drives are acceptable. Chain driven units shall consist of a heavy duty, double pitch roller chain driven by a motor through a gear reducer and drive sprocket. The roller chain shall always engage at least two modular flight assemblies.
- b) For the new devices, a minimum of two drives, are required for each unit for redundancy purposes. The device shall be designed and configured such that if one of the drives should fail, the device shall continue to operate at 100% capacity including the ability to start-up under full load conditions with the remaining drive unit(s). An easy access and means for disconnecting a failed drive/reducer from the carriage chain/friction drive shall be provided to allow for system maintenance with a minimum of time and effort.
- c) A one-way or sprag clutch are recommended to be installed between the reducer and the roller chain which will drive in only one direction and free

wheel when the drive motor is failed or de-energized. The remaining drives shall not incur the additional load of a failed or de-energized drive.

- d) Each drive shall be equipped with an appropriately sized electronic variable frequency drive controller. The drive design shall provide for potential of variations in "actual" motor speeds, synchronization, and torque load balancing. Motors are to be of the 480 VAC, 3-phase, 60 Hz Inverter duty copper-wound NEMA MG1, Part 31 Rated Design "B", Class "H" Insulation at 1.0 Standard Service Factor with Class "F" temperature limits. All motors shall be of the "high efficiency - low energy" type. The drive motor/VFD shall be sized to permit start-up under full load conditions.
- e) The design of the drive motor circuitry and programming shall provide that the slope plate unit can remain operating when a drive motor safety disconnect switch turned to the off position. This condition shall be reported in the MDS alarms and status screen. Returning the disconnect switch to the on position in this case, shall not create an issue.
- f) Provide one 120 VAC, single-phase, 60 HZ duplex outlet, as a maintenance outlet, along with a maintenance light and light switch, in the general vicinity of each drive assembly. The maintenance light on/off switch shall be installed under the claim device decking adjacent to each access hatch. A junction box in the general vicinity of each drive unit, with related wiring back to the respective circuit panel (s), will be provided by others. Assume the responsibility to coordinate the location of the junction box and to run the necessary conduit and wires between the junction box and the maintenance outlet, the light and light switch. Coordinate the installation of the maintenance lighting and outlet with the COTR.
- g) The control system shall incorporate a startup delay to assure that the slope plate device is running at full speed prior the start-up of any feed conveyors.
- h) Install a control station in close proximity to each drive unit with an Auto/Maintenance/Jog switch for use by maintenance personnel only. When the switch is in the maintenance or jog position, it shall prevent the respective feed conveyors to feed bags onto the unit. The Key switch for this control station shall also include control functionality that will permit the jogging of the unit for use by maintenance personnel only; the device shall move (jog) in the normal direction of baggage flow only when the key switch is held in the "Jog" position. The control station for this switch shall also include an E-stop pushbutton and a Reset/Restart pushbutton.

2.5.23.3 Cross-Overs

- a) Makeup units (non-public side) shall have crossover(s) installed for maintenance access. A crossover shall consist of a handrail to assist in descending the inclines plates, a small platform and a ships ladder or

stairway to descend into the inside of the unit. At minimum one (1) crossover for units less than 50 ft long, two (2) crossovers for units greater than 50ft long.

- b) Claim units (public side) shall not require maintenance crossovers.

2.5.23.4 Pallet/Flight Assemblies

- a) Each flight assembly shall consist of a steel support assembly with upper support wheel, a flight (cover pan) and a segmented, molded rubber bumper at the lower end.
- b) Each module shall be connected at its lower end to a continuous device linkage, which incorporates the lower support wheels. Upper and lower support wheels shall have polyurethane treads for quiet operation of the device. Flights shall be 14-gauge stainless steel with a rub strip (per manufacturer's design) applied to the underside of each flight at the trailing edge to prevent scratching or scoring of pallets.

2.5.23.5 Frame and Track

- a) The frame shall consist of standard modular assemblies bolted together to form a support structure and guide for the flight assemblies. The track shall be of rolled or formed structural steel. Structural supports for the tracks are to be spaced on a maximum of 4' centers.
- b) Once the structure of the device has been installed and properly aligned, all track joints and cam follower guide rail joints shall be welded and ground smooth to assure that the related track and guide surfaces are smooth and without vertical and horizontal differences.
- c) The design of the incline pallet device shall incorporate a means of expansion of the device to offset any wear in the main link bushings/connecting link pins or similar components.
- d) The design of the means of device expansion shall include, at a minimum, the following items:
 1. Overlapping design of the cam follower guide track so that the cam follower surface is always in contact with some portion of the guide track at the expansion joint.
 2. Heavy-duty jacking-bolt arrangement to assist in expanding the device when needed.
 3. Special attention is to be given to the design, manufacture and installation of the inner and outer perimeter finger guards as well as the vertical front face skirting at the expansion point.

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4. The design, manufacture and installation of the special expansion joint perimeter finger guards shall assure that they do not create a snag point.
 5. To further reduce the potential of snagging baggage at these expansion joints, the special finger guards are to be welded and ground smooth on the upstream end of each of the special guards.

2.5.23.6 Finish and Trim

- a) All steel trim elements of the incline pallet device that are located in the public area of a terminal shall be 304 stainless steel with a #4 brush finish.
- b) All trim elements shall be properly aligned both vertically and horizontally. Butt joints of adjacent stainless steel trim elements shall provide a smooth surface. Sharp edges on any of the stainless steel trim elements as well as voids between adjacent element joints are not acceptable. In addition, all radii of trim elements shall match.
- c) Vertical skirting shall be no more than ¼" above the floor unless otherwise approved by Owner (or OAR).
- d) All conveyor finishes and designs shall be coordinated with the Owner (or OAR). Submit catalog cuts and samples of the specified finishes (i.e., stainless steel, decking components) for review and approval by the Owner (or OAR).

2.5.23.7 Finger Guards

- a) A finger guard consisting of minimum 12-gauge stainless steel formed side rails shall be installed. The gap between the pallets and the finger guard shall not exceed 3/32". The vertical and horizontal alignment of the adjacent butt joints of the finger guards shall not be misaligned nor is there to be any gap between the adjacent guards.
- b) Special attention is to be given to the design, manufacture and installation of the stainless steel inner and outer perimeter finger guards as well as the vertical front face skirting at the expansion point of the incline pallet device.
- c) The design, manufacture and installation of the perimeter finger guards at the device expansion points shall assure that they do not create a snag point. To further reduce the potential of snagging baggage at these expansion joint locations, the finger guards are to be designed and installed in an overlapping manner. The overlapping finger guards are to be welded and ground smooth on the upstream end of each expansion joint location.

2.5.23.8 Inner Guards

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- a) An inner perimeter guard/deck trim shall be provided in the public areas with stainless steel deck trim. The stainless steel trim for the interior decking of the device shall consist of a formed angle trim element of 12 gauge minimum stainless steel having minimum effective height of 6" to keep bags contained within the unit. The formed angle trim shall effectively act as a vertical skirting trim for the elevation difference between the pallets and the raised decking. The top of the formed angle shall overlap the deck by a minimum of 2" for carpet edge concealment (carpet is to be provided and installed by others).
 - b) An inner perimeter side guard shall be provided for slope plates installed in non-public areas. A painted steel inner guard shall consist of a formed angle inner guard element of 12 gauge minimum painted steel having minimum effective height of 6" to keep bags contained within the unit.

2.5.23.9 Decking

- a) The top of deck shall be provided with a stainless steel finish and carpeting. Assume the responsibility to provide the stainless steel finish as illustrated in the Contract Documents. Carpeting on Claim Device decking is not part of the BHS scope of work, it will be provided by others. Assume the responsibility to coordinate the installation of the stainless steel finish with the finish that will be provided for the building columns (between the two feed conveyors) and with the deck carpet installation (or other material) to provide a uniform finish for the claim device decking.
- b) In the areas of the claim device deck, where carpeting is planned to be installed, provide each incline pallet claim device with a 3/4" FR-S rated fire resistant "tongue and groove" plywood decking, or fire rated Medium Density Fiberboard (MDF) decking, which shall be supported by a framework of FR-S rated fire resistant structural lumber or steel (e.g. 16 gauge 3/8" metal studs) that shall be designed for a dynamic load of 75 pounds per square foot.
- c) In areas of the claim device deck, where stainless steel finish is planned to be installed, use only the fire rated MDF for decking. All plywood and MDF joints shall be properly aligned, fully supported by the deck support framework/structure and shall comply with the specified requirements in Section 064023 (Interior Architectural Woodwork), paragraph 2.2.
- d) Provide hinged access door(s) (with appropriate stainless steel trim) in the decking in close proximity to each drive assembly, as illustrated in the contract documents. Additional access doors shall be provided as coordinated with the Owner (or OAR) over and above the access doors that are required at the drive locations to accommodate access under the decking for maintenance purposes. The access door(s) shall be of sufficient size to permit removal of the drive assembly components and

allow for routine maintenance of the assembly. The access door(s) shall be equipped with flush mounted grab handles.

2.5.23.10 Transition Plate

- a) A transition plate shall be designed and installed at the discharge end of each in-feeding conveyor for the smooth snag-free transfer of baggage onto the device. Special care shall be taken in the design and installation to ensure that re-circulating baggage on the device shall not be damaged or snagged by the plates. The discharge end of the plate should be extended past the inner perimeter guard. In public claim areas, the plates shall be of the same stainless steel type and finish as other trim elements.

2.5.23.11 Toe Kick and Molding:

- a) A minimum 4-3/4" toe space height shall be provided at the base of the front peripheral skirting.
- b) Black vinyl cove molding shall be installed at the back of the toe space and shall be flush with the finished floor of the baggage claim area.

2.5.24 Flat Plate Device

2.5.24.1 General

- a) Flat plate devices shall consist of crescent shaped plates (fitting and sliding together) forming a continuous level circulating surface.
- b) The crescent plates shall be designed to meet or exceed the dynamic and static loads (specified for flat plate devices)
- c) The flat plate devices shall support a static load of 200 lbs/ft., and a live operating load of 70 lbs/ft.
- d) The usable width of the flat plate device shall be between 33" and 35".
- e) Flat plate claim device height shall be at 12".
- f) The flat plate device is normally operating at a speed of 90 feet per minute, and is capable of travelling in either a clock-wise or counter-clock-wise direction.
- g) The loading of the flat plate device can be achieved by manual loading, up to a rate of 30 bags per minute.
- h) All flat plate wheels will be polyurethane.

2.5.24.2 Drive System

- a) Caterpillar and friction style drive units are recommended for flat plate devices.
- b) The flat plate claim device drive module shall be enclosed, and contains a motor and gear box assembly, driving an endless heavy duty roller chain.

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- c) A minimum of two plate assemblies are positively engaged at any time, which provides a direct mechanical link between the drive chain and the conveying surface.
 - d) All flat plate device drives shall be equipped with a Soft Start controller.
 - e) Variable Frequency Devices (VFDs) may be used, in lieu of Soft Start controllers.
 - f) The drive shall be designed to allow full load conditions at start up.
 - g) Easy access and means for disconnecting a failed drive unit shall be provided, to allow for system maintenance (with a minimum of time and effort).
 - h) Flat plate drive designs and motor applications must provide for the potential of variations in "actual" motor speeds, (so that the drive motors are equally loaded).
 - i) Motors shall be High Efficiency, High Slip, NEMA Design "D", 1.0 service factor, Class "F" temp limits, and Class "H" insulation.
 - j) The horsepower of the motors shall be sized adequately to meet the load conditions under full loading at start-up.
 - k) Double set screws are to be used to restrain idler shaft sprockets.
 - l) No lateral movement of the sprockets shall be permitted.
 - m) Motor Safety Disconnect (MSD) switches shall open the control circuitry of the unit, whenever the disconnect switch is in the off position.
 - n) When turned back on, the disconnect switch shall reactivate the drive start controls, allowing the Soft Start controller (or VFD) to control the drive motor start up.

2.5.24.3 Maintenance Equipment

- a) In the drive locations, (in public areas) a maintenance access hatch shall be provided (in the decking).
- b) The Owner's (or OAR's) Electrical Contractor shall provide a 120V, single-phase, 60 Hz duplex outlet, along with maintenance light and On/Off switch. An associated J-box shall be provided (under the decking) with wiring to the building circuit breaker panel.

2.5.24.4 Guide Track and Frame Assembly

- a) The flat plate guide track shall be made of heavy gauge steel (rolled or formed).
- b) The frame shall be made up of sub-assemblies, bolted together, to form a framework and guide way for the inclined plates.

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- c) Structural supports shall be placed on a maximum of 48" centers.
 - d) The frame work and track shall be set up, aligned, and leveled by the BHS contractor, (using jacking bolts).
 - e) The guide way joints shall be welded, and ground smooth so that all plate assemblies (moving across the guide way, completely around the track) shall have very little resistance, be completely level, and have no bumps.
 - f) Flat plate device expansion techniques must be incorporated to reduce the effects of wear and tear on the drive, links, bushings, pins and other components.
 - g) Expansion techniques may include the use of heavy duty jacking bolts, extra finger guarding, and gap filling elastomeric materials.

2.5.24.5 Crescent Plate Carrier Assemblies

- a) Crescent plates must be steel with a thickness of 5/16" and painted black.
- b) For the public area, claim device plates shall have a black, (matte finish) urethane covering on the exposed side of the plates.
- c) Assembles shall also include guide wheels and connecting links.
- d) Guide wheels are to be constructed of polyurethane treads for quiet operation.
- e) All hardware on the outside of the unit must be countersunk, to insure that there are no snag points.
- f) Any spaces between the crescent plates must not exceed 1/8".
- g) All carrier plates must be level, to ensure smooth baggage transportation around the flat plate device.
- h) No more than a 1/16" elevation change between plates shall be acceptable.

2.5.24.6 Finish and Trim Guarding

- a) All trim in baggage claim areas shall be 12-gauge, Type 304 stainless steel, with a #4 finish, and shall be provided on both sides of the crescent carrier plates.
- b) All fasteners in public areas shall be stainless steel.
- c) The trim shall overlap the crescent plates by 3" in order to provide finger guarding.
- d) Gaps between finger guarding and crescent plates must not be more than 3/32".
- e) The guarding in non-public areas shall be painted black and shall be wear and rust resistant.

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- f) All butt joints including radius trim pieces shall have less than a 1/16" gap and have no misalignment around the device.
 - g) All rollers and greaseable bearings shall be easily accessible (for removal and/or replacement).

2.5.24.7 Side Guards and Flares

- a) 21" inner perimeter side guards shall be provided on all flat plate units (in the non-public area) to prevent baggage from falling over into the middle of the device.
- b) Flat plate claim units shall have a formed stainless steel deck trim with a 6" vertical portion between the crescent plates and the top of the deck, (as a back guard), and a horizontal 3" portion, (providing a cap for the carpet) on the decking. Trim shall be coordinated with architect.
- c) Steel support angles on the backside of the deck trim shall be a minimum of 1 1/4" x 1 1/4" x 3/16" and shall be spaced on 2'-6" centers.
- d) The side guards shall be designed so that maintenance access shall not be restricted.
- e) Openings in side guards (for Photo-eyes and/or reflectors) shall be punched and concaved inward, away from the baggage.
- f) The diameter of the openings shall not exceed 1 1/2".
- g) Flares shall be provided (on the side guarding) at the gap downstream of the fire/security doors, to prevent bags from snagging, and ensure a smooth transition between the public and non-public areas of the device.

2.5.24.8 Decking

- a) The flat plate decking shall consist of 3/4" tongue and groove fire rated plywood (supported by steel or fire rated wood framework) designed to support a load of 75 lbs/sq.ft.
- b) Each vertical support shall have a jacking bolt and pad at the bottom of the support (to level the deck).
- c) All wood used for the deck shall be fire retardant.
- d) Any substitution of materials shall need to be approved by the Owner or the OAR.
- e) Carpeting shall be installed "by others" on top of the 3/4" deck.
- f) Coordination shall be made for the carpet and BHS deck trim installation.
- g) After the installation of the carpet, the deck angle trim shall then fit on top of the carpet, securing the carpet down.

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- h) Maintenance access hatches shall be provided at drive locations in public areas and any other locations (shown on the contract drawings).
 - i) Maintenance hatch doors (where required) shall be hinged and equipped with flush mounted handles and locks.
 - j) The hatch doors shall have "Lock-Out/Tag-Out" safety regulated locking mechanisms.

2.5.24.9 Toe Kick and Molding:

- a) Flat plate devices shall have a minimum of 4-3/4" toe-kick space around the bottom of the entire unit.
- b) There shall be a 4" thin gauge HRS piece (painted black) tack welded around the device in the toe-kick area.
- c) Black vinyl molding shall be installed against the HRS piece and shall be flush with the finished floor, in the bag claim area.

2.5.25 Roller Conveyor/Gravity Deck (If Applicable)

- a) Roller bed section to be supplied with rollers installed in the high position. Rollers to be nominal 1.9" diameter x 0.065" wall on 3" centers.
- b) Frame size shall be compatible with associated Ball transfer table.
- c) Maximum load rating to be 100 pounds per roller.
- d) Rollers shall be galvanized.
- e) Beds, frames and supports shall be painted.
- f) Roller conveyor in public area shall have a stainless steel shroud/cover (with toe kick) and end cap.
- g) Rollers which can create a pinch point with guarding shall be "pop-up" type for safety.

2.5.26 Ball Transfer Tables (If Applicable)

- a) Frame size shall be compatible with associated roller conveyor and shall be minimum 10 gauge galvanized steel.
- b) Ball transfers shall be 1 inch diameter on 4 inch nominal square spacing.
- c) Ball transfers shall be easily removable for maintenance.
- d) A cover plate shall be provided that exposes only the ball with ball retaining cup below minimize snagging of bag straps. Ball height above the plate shall be sufficient to allow easy transfer of luggage while preventing snags.
- e) Beds, frames and supports shall be painted.
- f) Table height adjustment shall be from nominally 10" to 36" Floor Supports

2.5.27 Floor Supports

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- a) The BHS contractor shall provide new floor supports up to 7'-6" in height, above the finished floor or the mezzanine below.
 1. The BHS contractor shall provide the associated design and calculations and drawings, "signed and sealed" by a registered Professional Engineer (PE), licensed in the state (or jurisdiction) of the work.
 2. The provided documentation shall show that the floor and hanging supports have been designed in accordance with the applicable codes.
 3. The design loads shall be confirmed to be accommodated by existing Airport structure, and subject to the approval of the Owner (or OAR).
 4. All BHS floor supports shall be constructed from #10 gauge or heavier material. Floor supports shall be vertically adjustable by at least three (3) inches in either direction and shall be of a heavy duty design, utilizing galvanized feet. BHS floor supports shall be located as follows:
 - i. Within one (1) foot of each associated component connection
 - ii. A maximum of five (5) foot centers on the load/unload baggage conveyors
 - iii. A maximum of ten (10) foot centers elsewhere within the BHS.
 - iv. All conveyors shall be adequately braced in order to ensure that there is no lateral or longitudinal displacement.
 - b) The associated floor supports shall be removable (for ease of BHS installation). Supports on removable conveyors and associated equipment shall use heavy duty casters.
 1. The BHS contractor shall provide the bracing between the vertical support legs and the baggage conveyor bed frame (to ensure rigidity of the installed conveyors and associated equipment).
 2. The BHS contractor shall anchor the floor supports (to the floor), using the fastening methods that are in keeping with the floor construction, and approved by the Owner (or OAR).
 - c) The associated power turns shall be floor supported (or as recommended by the manufacturer).
 - d) The BHS design and the installation of floor supports shall not prevent access to any floor vaults (for MEP and/or HVAC equipment). If any bridge-type supporting structures are required (in lieu of the vertical hanger rods), such structures shall be provided by the BHS contractor.
 - e) Floor anchors shall be wedge type Red Head Trubolt 3.75"x.375" (or equivalent) not extending more than .75" above base plate and female sleeves flush with the floor.

2.5.28 Hangers

- a) The BHS contractor shall provide associated design and calculations and drawings, "signed and sealed" by a licensed Professional Engineer (PE), registered in the state or jurisdiction of the work, showing that the ceiling supports have been designed in accordance with local and state codes.
- b) The design loads shall be confirmed to be accommodated by existing Airport structure, and subject to the approval of the Owner (or OAR).
- c) The BHS hangers shall be spaced at a maximum of ten (10) foot centers. Discretion shall be used in locating hangers, except where specific requirements are shown on the drawings.
 1. The ceiling hangers shall be limited to a maximum load of 750 pounds each. All ceiling supports shall be three-quarter inch (3/4") diameter "threaded rod" vertical hangers. Provide a minimum of six inches (6") for vertical adjustment. For horizontal conveyors, use no less than three inch (3") by three inch (3") by one-quarter inch (1/4") angle iron. For inclined or declined conveyors, use no less than 2 1/2" sch 40 pipe.
 2. All hanger connections shall be installed with safeguards to avoid loosening, due to vibration (with sway bracing installed) to provide rigidity on installed conveyor sections.
 3. Do not use side-guards to provide support for conveyors or other equipment. Do not weld anything to the building structural steel, unless pre-approved by the Owner (or OAR).
 4. Power turns shall be supported and attached, as recommended by the power turn manufacturer.
- d) BHS Overhead Attachments:
 1. Overhead attachments shall be designed to avoid the transmission of excessive conveyor periodic or momentary loads into the existing Airport structure. The Owner (or OAR) shall determine the acceptability of each specific condition.
 2. The BHS contractor shall replace all fireproofing materials removed during installation with approved asbestos-free material to an equal fire-rating at the attachment locations.

2.5.29 Platforms and Access Ladders

2.5.29.1 Platforms

- a) The BHS contractor shall design, fabricate and install platforms and associated access ladders and handrail for the BHS (where shown on the drawings, or as required for safety, proper operation and maintenance).

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- b) The specifications for suspending the platforms shall be generally the same as that for suspending conveyors. The platform transitory working live load shall be a minimum of 25 pounds per square foot, with deflection limited to 1/180 of the unsupported span length, under a concentrated 250 pound load.
 - c) The BHS contractor shall coordinate the walking surface of the #10 gauge HRS or "Bar Grating", with the Owner (or OAR).
 - 1. The minimum platform width shall be nominally thirty-six inches (36"), with a six inch (6") gap between the platform and the conveyor.
 - 2. Level platforms shall have a smooth surface. Inclined platforms of eight degrees (8°) or greater shall be equipped with an anti-skid walking surface. Steps shall be used if an elevation change is greater than eight inches (8").
 - d) The minimum head clearance to be provided shall be 6'-0". All obstructions less than 6'-0" above the grate height shall be wrapped with reflective "safety tape" and compressible open cell material (padding).
 - e) Platforms shall have four inch (4") high toe boards, except where they might interfere with conveyor access. All platforms and toe-boards shall comply with applicable U.S. OSHA standards and local codes. Clearance above platforms shall be a minimum of forty-four inches (44"), with a 1/4 design objective of seven foot-zero inches (7'-0"). Where platforms are necessary for access or maintenance, the conveyor shall be supported by a sill, (common to the platform).
 - f) Platforms shall include swing gates or off-sets, at access locations (per OSHA standards 1910.23). Provide padding, rounded corners, smooth surfaces and any other acceptable measures to ensure safety.

2.5.29.2 Stairs

- a) Provide stairs as shown on the Contract Drawings (or as required), to ensure personnel access to the BHS. The BHS contractor shall show the final number and locations for all stairs and/or ladders, on the submittal drawings.
- b) The stairs shall have a maximum rise of eight inches (8"), a minimum run of nine inches (9"), a minimum tread width of nine and one-quarter inches (9-1/4") and shall be at least thirty-four inches (34") wide.
- c) The maximum pitch for stairs is thirty-eight degrees (38°). Flights shall be uniform within one-eighth inch (1/8"). Intermediate flights shall not exceed twelve (12) steps. The required headroom above the stairs is six-foot six-inches (6'-6").

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- d) Stair tread shall have a non-skid upper surface and be designed in accordance with OSHA section 1910.23 and 1910.24.

2.5.29.3 Handrail

- a) All BHS handrails shall be designed per OSHA code of Federal Regulation Part 1926.500. Handrails shall be installed on all associated platforms and stairways, except where directly adjacent to conveyors.
- b) The handrails shall be thirty-four inches (34") to thirty-eight inches (38") above the platform or stair.
- c) Handrail vertical supports shall be spaced on not more than 8'-0" centers.
- d) Handrails for stairs shall be welded. Handrail ends shall be closed with a welded metal cap. The BHS contractor shall coordinate handrail style with the Owner (or OAR).
- e) Hand rails shall be a minimum of three inches (3") clearance all around.

2.5.29.4 Ladders

a) Vertical Ladders

1. Vertical Ladders shall not be used unless approved by the Owner (or OAR).
2. Fixed vertical ladders shall only be used where space does not permit the use of stairs or ships ladder. This includes any additional maintenance ladders (as required) to ensure safe access for all personnel who operate, maintain, or have access to the BHS.
3. Provide a safety chain and safety cage on ladders above eight foot (8') or as required by federal, state and local codes. The BHS ladders, rungs and handrail shall be Hot Rolled Steel (HRS) and shall meet or exceed OSHA standards, section 1910.23, 1910.26, 1910.27, 1926.500 & 1926.501.
4. All rungs shall be uniform spacing, less than twelve inches (12"), minimum, three-quarter inch ($\frac{3}{4}$ " diameter, sixteen inches (16") wide, and support a load of four-hundred (400) pounds.
5. Ladders and hand rail shall be a minimum of three inches (3") away from any wall.

b) Ships Ladders [Fixed]

1. Fixed vertical ladders shall only be used where space does not permit the use of stairs. The BHS ladders and handrail shall be steel and shall meet or exceed OSHA standards, section 1910.23, 1910.27, 1926.500 & 1926.501.

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2. The treads and stringers shall be slip resistant and capable of supporting a five hundred (500) pound load. The treads shall be a uniform distance with a maximum of twelve inches (12"). The pitch for ships ladders shall be between fifty degrees (50°) and sixty-seven degrees (67°).
- c) Swing Down Ladders (Counter Balanced)
1. The BHS contractor shall provide (counter balanced) swing down ladders as shown on the Contract Drawings (or where otherwise required) to allow safe access to platforms and walkways.
 2. Swing down ladders shall fold up in the direction of tug lane travel and shall be equipped with "flashing" amber beacon that shall be activated when the ladder is not in the fully "up" position, (detected by a limit switch or Photo-eye). BHS swing down ladders shall be held in the "up" position by a mechanism, (when not in use) and the mechanism shall allow the ladder to be lowered, by using no more than five (5) pounds of force.
 3. The swing down ladders shall be Type A aluminum, with three hundred and fifty (350) lbs. rated capacity, and a minimum of twenty-five and one-half inches (25.5") wide. The pitch for swing down ladders shall be between fifty degrees (50°) and sixty-seven degrees (67°). Treads shall be slip resistant and shall be a uniform distance with a maximum of twelve inches (12").

2.5.30 Protective Guarding

- a) The BHS contractor shall provide and install removable protective guarding beneath the associated conveyor beds, and around the conveyor drives, for all inclines and declines, one-foot six-inches (1'-6") above finished floor to seven-foot six-inches (7'-6") above.
- b) The protective guarding shall be sheet metal or expanded metal with the opening sizes in accordance with ANSI B 20.1. The protective guards shall extend at such a distance that a person cannot reach behind it and become caught in the space between the belt and pulley. The underpans, regardless of type shall be hinged and pinned for easy maintenance access; the pin shall have a lanyard attached to reduce potential of losing the pin. Sheet metal screws will not be accepted.
- c) If building constraints cause the BHS support structures to be less than 8'-0", the structure, framework, support etc., shall be encased in protective cushioning material (padding). Low overhead conditions shall be identified with safety marking tape (yellow / black striped). Provide and install prominently located "Low Overhead Clearance" warning signs.
- d) The BHS contractor shall provide adequate protection from falling objects (in work areas or aisles located beneath the overhead portions of the BHS) with gap

pans, netting, etc. The BHS contractor shall provide and install protective cushioning material (padding), where conveyors pass over a walkway, maintenance access areas, etc. (to prevent injury to operations and maintenance personnel).

- e) The BHS contractor shall provide personnel protection at all BHS platforms and walkways to ensure that any potential injury is minimized. This includes swing gates, or off-sets at access locations (per OSHA standards 1910.23).
- f) The BHS contractor shall paint all the protective guarding, (including the pipe guards around load areas, and at associated MCPs) with OSHA #1016 or #1026 "Safety Yellow" paint.
- g) The BHS contractor shall provide finger guards (at the end rolls) for all the associated loading and unloading conveyors.
- h) Provide a chain and safety cage on ladders above eight feet (8'-0"), or as required by state and local code.

2.5.31 Impact Protection

- a) The BHS contractor shall (at a minimum) provide the impact protection as shown on the Contract Drawings and match the Airport standard guard rail system. Adequately protect the BHS conveyors, MCP's and all other associated equipment.
- b) The BHS contractor shall design the impact protection to withstand the impact of a standard tug and fully loaded cart travelling at a speed of six (6) miles per hour (minimum).
- c) Construct the impact protection and supports of structural steel, heavy walled sections. Securely fasten all the impact protection components to each other, and anchor them to the floor. The BHS operational and maintenance access to the associated protected equipment shall not be restricted by the provided impact protection.
- d) Provide individual bollard-type impact protection around associated MCPs, and throughout the BHS, (where required). Bollards shall be constructed from steel pipe, concrete filled with crowned caps. The minimum diameter for the BHS bollards is eight inches (8"). BHS bollards that are exposed to the weather shall be hot-dip galvanized. The bollards that are not exposed to the weather shall have primer applied, and then painted with OSHA #1016 or #1026 "Safety Yellow" paint.

2.6 BHS ELECTRICAL REQUIREMENTS

2.6.1 Motor Control Panels

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- a) Motor Control Panels (MCPs) shall consist of floor-mounted sheet steel "Hoffman" or approved equal enclosures, with hinged doors, and key locks.
 - 1. All Motor Control Panel enclosures shall be NEMA Type 12, except those outside and/or exposed to direct rain, which shall be Type 3R or 4 Weatherproof.
 - 2. The exterior of the MCPs shall be gray.
 - 3. The interior of the MCPs, (including the back panels) shall be white.
 - b) All BHS Motor Control Panels shall be designed and fabricated by an electrical control's company with a history of 5 years' experience with systems of similar size and complexity.
 - 1. MCPs shall be delivered to the site, fully designed, manufactured, programmed and pre-tested (ready to install and terminate the associated field wiring).
 - 2. Each Motor Control Panel shall be provided with an Underwriters Laboratory "UL" sticker, affixed to the back panel, adjacent to the disconnect switch.
 - c) The MCP main power disconnect switch shall be a heavy duty fused switch (for 480-Volts, 3 Phase, 60Hz).
 - 1. The main disconnect shall be Allen-Bradley or approved equal.
 - 2. Provide a Plexiglas Safety Shield with standoffs (or similar suitable protection) over the main fuses.
 - 3. The main fuses shall be a maximum of 600A - RK1 fuses. The main fuses shall be sized for an additional 30% code motor load.
 - 4. The main disconnect shall be installed inside the MCP housing with the operating handle arranged to open or close, with the doors of the control panel in the closed position.
 - d) To minimize the possibility of any ground water damage to the MCP's located outside of the BHS control room, the BHS contractor shall be responsible to ensure that a minimum 4" thick concrete pad is installed for the MCP's to be mounted on.
 - e) The door opening mechanism shall have a "manual override" provision to permit the opening of the door, (by qualified personnel), with the power "On".
 - f) An open type motor starter with circuit breaker, motor protector switch, or fuses shall be installed on the interior back-panel for each associated BHS conveyor motor.
 - g) Each motor starter and each control device within the MCP shall be provided with a nameplate (for maintenance and troubleshooting purposes).

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- h) The BHS contractor shall provide LED light fixtures inside each MCP to properly illuminate the electrical equipment and tags, which shall turn "On" when the MCP door is opened.
1. The light fixtures are to be fed from the "line side" of the MCP power source, and shall remain on, even if the MCP main disconnect is off.
 2. The "hot" wires providing power to the light fixture shall be "Yellow", with guarded terminations to protect personnel from accidental contact.
 3. Provide a door switch inside the panel (to control the light fixture) that is activated by the main panel door. Use a single pole switch rated at 20 amps and 120 volts.
- i) The BHS contractor shall provide a 120v, 5-amp duplex receptacle in each motor control panel for powering a laptop computer or other programming device.
1. The outlet shall be fed from the "line side" of the MCP power source, so that the receptacle shall remain powered, regardless of the condition of the MCP main disconnect.
 2. The "hot" wire providing power to the outlet shall be "Yellow". All terminations of this "Yellow" wire shall be guarded, in order to protect personnel from accidental contact.
 3. Mount a warning label on the inside and the outside of the MCP, next to the disconnect switch stating:

"CAUTION" - THIS MCP CONTAINS "YELLOW WIRES" WHICH SHALL REMAIN "HOT" WHEN THE MAIN DISCONNECT SWITCH IS TURNED OFF.
- j) Provide thermostatically controlled cooling fans (if required by conditions) within the MCP cabinet to monitor and prevent internal temperatures from exceeding component environmental limits that are sized based on an ambient temperature of 100° F (configurable).
1. Provide replaceable or cleanable filters on the intake vents. Configure, through appropriate controls functionality, the cooling fans to run when the respective subsystems are operational and the pre-set ambient temperature is exceeded. The MCP cabinet over-temperature (e.g., 120° F) shall be monitored by then modified existing MDS
 2. When the MCP temperature exceeds the pre-set limit (which shall be configurable) a distinct alarm message shall be displayed on the MDS graphics and text displays. Provide separate circuits for the power and control of the MCP cooling fans; Note that these circuits shall originate within the respective MCP.

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- k) The BHS contractor shall provide an 18" (minimum) rectangular or square system static map, showing the annotated system layout for the conveyors and devices controlled by the MCP.
 - l) Each motor control panel shall have pushbuttons, pilot lights, etc. which shall include the following:
 - 1. Off/On key switch
 - 2. Illuminated Start pushbutton
 - 3. Non-illuminated Lamp/Alarm pushbutton
 - 4. Non-illuminated Alarm Silence pushbutton
 - 5. Illuminated Fault Reset pushbutton
 - 6. Illuminated E-Stop pushbutton
 - m) The MCPs are equipped with audible and visual alarms including, at a minimum:
 - 1. Start Warning Beacon (Amber)
 - 2. E-Stop Activated Beacon (Red)
 - 3. Start/Fault/Estop Audible Alarm
 - n) The working space in front of the MCPs shall be a minimum of 42". (In all cases), and 78" minimum in height.
 - 1) The workspace shall permit at least 90 degree opening of all the MCP doors.
 - 2) Refer to the current applicable National Electrical Codes to determine working space requirements.
 - o) The BHS contractor shall provide a laminated card showing the associated system's motor schedule with horsepower, fuse size and overload heater size (affixed to the inside of the MCP door).
 - p) BHS MCPs that are not located on a raised curb (or raised floor), shall be provided with a concrete or galvanized steel plinth, pedestal, legs or similar means to raise the MCP (a minimum of 4 inches above the floor). This shall minimize the possibility of ground water damage to the MCPs located outside of the BHS control room.
 - q) All MCP documentation shall be provided in hard copy located within the MCP door pocket, (for reference). This documentation shall include but not be limited to:
 - 1) Electrical Schematics
 - 2) VFD Settings
 - 3) MCP Layout
 - 4) Motor manifest with corresponding spare parts list

r) Diagnostic Software System

1. The diagnostic software system running on a PC and located in the control room is designed to provide maintenance data and statistical information about the scanner array's performance.
2. Each scanner array controller will interface to the diagnostic software system by means of an Ethernet interface with TCP/IP protocol.
3. The diagnostic software system enables the remote monitoring and download of log files.
4. The diagnostic software system includes the following:
 - i. System List: Screen displays the System ID, System Name and IP address (array designation), Device ID, and current day read rates.
 - ii. Long Term Read Rate Data: Screen displays of Long Term Read Rate Overview (total log period by array) and Long Term Read Rate Detail (by day, by array).
 - iii. Daily Statistics: Screen displays daily statistics (by day, by array, by scanner head) and daily statistics by selected scanner head groups (by day, by array, by group).
 - iv. Exclusive Scanner Read Rate: Screen display of the frequency of when only ONE scanner head read the baggage tag during the scanning zone (by array, by head).
 - v. Daily Course: Screen displays hourly read rates (by hour, by array).
5. Histograms: Screen displays of object length, object gap, multiple read occurrences, and X/Y/Z positions of the baggage tags read.
6. System Info: System documentation screens
7. Download Page: Screen containing raw data files (by day, by array)

2.6.2 Electrical Service to be provided

- a) Refer to the Electrical specification sections for the design and construction building infrastructure improvements and other requirements for power supply to the BHS system.
- b) Prior to shutting power off to any existing systems, the BHS contractor shall confirm that power shut down shall not impact the Airport operations.
- c) The standard voltages for the Airport are:
 1. 480 volts, 3 phase, 60 hertz - primary
 2. 120 volts, 1 phase, 60 hertz - secondary
- d) Power for the various subsystems shall be provided at locations shown on the Contract Drawings prepared by the BHS contractor's electrical engineer.

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1. The Full Load Amp (FLA) rating shall be indicated on the Contract Drawings. It shall be the BHS contractor's responsibility to verify the FLA requirements and notify the Owner (or OAR) of any increase or decrease.
 2. Each Power Distribution Point (PDP) that is dedicated for the BHS shall consist of cables in an appropriately sized junction box (supplied and installed by the Airport's Electrical Contractor and connected at its source to an appropriately sized circuit breaker (located at the building substation panel). The power drop shall terminate with approximately 20' of coiled cable.
- e) The BHS contractor shall provide and install all the required main cables from the dedicated Power Distribution Points (PDP) to the various BHS distribution boards, and onward to the associated MCPs, (as necessary to meet the requirements of the specification).
1. The BHS contractor shall be responsible for all the electrical work downstream of the PDP locations, including the BHS distribution boards, associated MCPs, and all other conduit and wiring in between.
 2. The BHS contractor shall be responsible for all the power connections from the associated MCPs to all the other BHS equipment.
 3. The BHS contractor shall size the power feeders from the power drops at 125% of the minimum NEC (or applicable local code) permitted size for the full load amps required.
- f) The BHS contractor shall provide and install all the services, feeders and disconnect switches for branch circuits to each associated motor control panel, (with separate circuits for each subsystem).
- g) The BHS contractor shall also provide and install all necessary panel boxes, conduits, wireways, conductors, breakers/fuses, transformers and any other equipment and/or materials required to complete the electrical power distribution for the operation of the baggage handling systems. Refer to NEC Article 300 (latest version) for wiring methods.
- h) The amperage shown for each PDP in the Contract Drawings shall be confirmed by the BHS contractor in his bid submission.
1. The BHS contractor shall provide detailed power calculations for review and approval by the Owner (or OAR).
 2. Coordinate the detailed power requirements (including any increase / decrease) with the Owner (or OAR).
- i) Provide separate circuits for controlling Programmable Logic Controllers (PLCs), powered fire/security doors, etc. Note: These circuits shall originate within the associated MCPs.
- j) The BHS contractor shall calculate the electrical power supply requirements on the basis of the total connected load, (with a diversity factor). Per NEC, Size the

conductors to ensure that the voltage drop does not exceed 2% at the farthest outlet of power.

- k) Provide 120 volt, single phase, 60 Hertz power for operation of the BHS control circuits. The control power for each associated MCP shall be obtained by means of a transformer connected to the load side of the 480 volt input power.
- l) All baggage handling systems that use programmable logic controllers shall be equipped with the appropriate number and size of power regulators (to ensure that the power for the respective PLCs is properly conditioned). Power regulators shall be of the type manufactured by the Sola Corporation (or approved equivalent).
- m) All electrical equipment, components, devices and accessories shall be listed, labeled and identified as being suitable for their intended use by the testing agency (acceptable to authorities having jurisdiction). This shall include MCPs and any control panels or cabinets, whether factory or contractor fabricated.
- n) The supplied control systems and equipment shall be compatible with, and operate reliably and effectively with, the normal electrical supply typically available.
- o) The equipment shall not be unduly sensitive to fluctuations in supply voltage which may typically vary by plus or minus (+/-) ten percent (10%) of nominal values.
- p) Electrical power supply filters/conditioners and/or regulators shall be supplied for all equipment, which cannot meet the specifications stipulated.

2.6.3 Emergency Power

- a) Coordinate emergency power with the airport (or OAR), general contractor and power systems contractor if emergency power is to be installed in any area. If emergency power is supplied, switching will be controlled prior to MCP connection and will have no impact to the BHS MCP installation.

2.6.4 Power for Subsystem Devices

- a) For each required service disconnect, the BHS contractor shall furnish and install all feeders and disconnects for each BHS branch circuit.
- b) The BHS contractor shall provide and install all the associated MCP's, transformers, circuit breakers, fuses, wire ways, conduits, conductors, equipment, and materials required to complete the electrical power distribution (for the operation of the systems).
- c) The BHS contractor shall show on the shop & installation drawings, the electrical power requirements, and circuit breaker sizes for each associated PDP and MCP.

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- d) The BHS contractor shall furnish and install all the required 120 VAC, single phase control power, by means of a transformer located in the associated MCP (required by each subsystem).

2.6.5 Uninterruptible Power Supply (UPS)

- a) The contractor shall furnish and install one UPS to provide a minimum of one (1) hour of power to PLCs and provide power to all redundant server computers, switches, status monitors, prior to emergency power activation.
- b) This unit shall have a network connection for supervision of the UPS's on-line health including any fault conditions. Power outages shall be alarmed on MDS.
- c) The system shall be designed to "auto-recover" without human intervention after a power outage and or UPS failover. The procedure to start the system should also be detailed should components fail to auto start. This procedure should be submitted and coordinated with the airport. This applies to items not limited to but including servers, switches, monitors, PLCs, etc.

2.6.6 Motor Safety Disconnects (MSDs)

- a) The BHS contractor shall furnish and install motor safety disconnect switches for each motor in the system, per ANSI B20.1. The disconnect switches shall be heavy duty, 480VAC, 3 Phase, (NEMA Rated for the application) with an auxiliary contact (120VAC) to report the status to the associated PLC, (for system monitoring).
- b) The BHS motor disconnect switches shall be located within three feet (3') of the associated motors, in a visible and easily reachable location.
- c) MSD's shall be (lockable in the "Off" position) UL listed and comply with all NEC and Local code requirements.
- d) If motors with clutch/brakes are provided, the disconnect switch shall shut off the motor and clutch/brake simultaneously and have an auxiliary contact to report the status of each disconnect (to the PLC) for system monitoring. BHS Motor Safety Disconnects
- e) All BHS motor safety disconnects shall be identified by a unique number and shall be located 1" above the disconnect switch.
- f) The BHS motor safety disconnect label shall read as follows: MSD/ (Conveyor ID) – (unique number). i.e. MSD/IB1-03

2.6.7 Electrical Conduits

2.6.7.1 BHS Conduits

- a) Unless otherwise approved, all BHS electrical wiring shall be run in rigid galvanized steel conduit (with galvanized threaded fittings and couplings) $\frac{3}{4}$ " or larger, when located 8' or less above the finished floor; and EMT $\frac{3}{4}$ " or larger above 8'.

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- b) Floor mounted conduit shall be mounted above the floor, on 1-7/8" Unistrut minimum or other equivalent mounting hardware and allowed only in non-accessible areas unless otherwise approved by the Owner or OAR.
 - c) The BHS conduits shall be grouped together (as much as possible). Conduits shall be installed by supporting them from the building wall, using "uni-strut" type mounting channels (to provide clearance to the wall).
 - 1. Conduits shall not be welded to structural members.
 - 2. Conduits shall not be mounted on power turn side guards.
 - 3. Conduit should be run as to not impede maintenance access.
 - 4. Conduits shall be fixed securely to the walls, ceiling, or other adjacent structures by means of mild steel hangers, or brackets of adequate mechanical strength. The hangers or brackets shall be painted with anti-rust epoxy paint.
 - 5. Attachments for conduit shall be provided at regular intervals not exceeding 48" for straight run and at a distance not exceeding 8" on both sides from a bend or intersection.
 - 6. A minimum clear space of 3/4" shall be left behind all cable trays.
 - d) All Liquid Tight / Flexible Conduit shall be a minimum of 3/4".
 - 1. Install liquid-tight flexible conduit for connection for electrical equipment were subject to movement and vibration. Provide appropriate liquid-tight fittings.
 - 2. Use liquid-tight flexible metal conduit for final connection to motors, Photo-eyes, limit switches or any device, which may require adjustment after installation (objective shall be not to exceed 3' in length).
 - e) All BHS electrical conduits, fittings, etc. (entering any enclosure, pull box, etc.), shall be equipped with appropriate bushings, to prevent damage to the wire insulation.
 - f) All BHS electrical conduit fittings shall be of the compression type.
 - g) Intermediate Metal Conduit (IMC) type conduit is not acceptable.
 - h) The BHS power wire (480 volts) and low voltage control wiring (less than 90 volts) shall be run in separate conduits.

2.6.7.2 BHS Raceways

- a) All BHS raceways shall be concealed in public and finished areas.
- b) All BHS raceways shall run parallel to, or perpendicular with, building column lines.

2.6.7.3 BHS Wireways

- a) Divided 6" x 6" metal wireway, 16 gauge minimum may be used to route power wires and controls wires to the BHS devices. All BHS wireways shall have hinged covers and insulating pads on the inside radius of internal bends, (at all elevation and horizontal changes).
- b) The BHS wireways shall be visually inspected after the installation of insulating pads, and prior to installing any cable or wire. Open wireways shall not be acceptable.
- c) The BHS wireway design and installation shall be of the "lay-in" type, (to avoid the need to thread wires through wireway ends and transition connectors).
- d) Any BHS wireway installed below a conveyor bed section shall not interfere with maintenance access or the transport of large maintenance parts or rods underneath conveyors.
- e) All cable routing methods shall be approved by the Owner (or OAR).

2.6.7.4 BHS Electrical Boxes

- a) All BHS junction boxes, outlet boxes, pull boxes and cover plates shall be suitable to use with rigid and/or EMT conduit,
- b) All BHS electrical boxes shall conform to the National Electric Code for minimum wiring space requirements and material thickness.
- c) All BHS electrical boxes shall have screw fastened covers.

2.6.8 Conductors (Wires)

- a) All BHS power wires shall be a minimum of #12 AWG, 600 volts, type THHN or THWN, insulated, stranded, copper wire.
- b) All BHS control wires (except for electronic circuits and cord & plug type devices) shall be a minimum of #14 AWG, 600 volts, type THHN or THWN, insulated, stranded, copper wire, and rated at not less than 90 degrees C.
 - 1. BHS electronic circuit wiring shall be a minimum of # 18 AWG, copper wire.
 - 2. BHS electronic multi-conductor cable assemblies shall be made up of single conductors, enclosed in shrinkable polyvinyl chloride plastic tubing.
- a) Any BHS flexible multi-conductor cords for other than electronic applications shall be type SO or SOJ.
- b) All BHS connections shall be made with wire of current carrying capacity consistent with the load and duty-cycle.
- c) Electrical power and control wiring shall not be run along the side of any conveyor side guards.

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- d) BHS wiring shall be run continuously from one piece of apparatus to another without splices in any conduit.
 - e) Keep all wires on their reels (while being pulled) and do not allow the wires to contact the ground or floor.
 - f) Provide a minimum of 5% spare conductors in all conduit home runs, with a minimum of two (2) spare control wires and one (1) spare power wire.
 - 1. Label the wires as spares (with unique Owner approved numbers)
 - 2. Spare wires shall be terminated within a terminal block and labeled accordingly.
 - g) Install one (1) green insulated, 600 Volt, stranded, copper, ground conductor, in each conduit and raceway.
 - h) BHS Wire Splicing
 - 1. The BHS control power, neutral and ground wiring may be spliced at easily accessible junction boxes (using appropriate terminal blocks).
 - 2. Splicing of any BHS control (signal) wire is not acceptable.
 - 3. BHS control stations, pull boxes, raceways, etc., shall not be used for wire splicing.
 - i) BHS Wire and Cable Identification
 - 1. Power Wiring – Line Side
 - a. 480V – Brown – Orange – Yellow
 - 2. Power Wiring – Load side
 - b. Wire markers with MCP #, Conveyor name and T1, T2, T3, (depending on the phasing of the wire).
 - 3. Control Power Wiring
 - c. AC Control Power – Black
 - d. AC Control Neutral – White
 - e. AC Control Signal – Red
 - f. DC Control Positive – Blue
 - g. DC Control Negative – Blue/White Stripe
 - h. Mechanical Ground – Green

2.6.9 Junction Boxes

- a) All BHS junction boxes shall conform to NEMA standards.

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- b) The use of conduit opening reducers is not acceptable for BHS applications. All conduit related openings in enclosures, pull boxes, etc. shall be of the appropriate size for the respective conduits.
 - c) Hoffman NEMA rated watertight conduit knockout closers are acceptable, (for closing unused openings).
 - d) All BHS junction box covers shall be permanently identified with the system name, circuits and destination and originating circuit location (from and to).

2.6.10 Electrical Equipment Identification

- a) Each BHS control station, and control device enclosure shall be supplied with laminated, (permanently attached), corrosion proof, etched, engraved or stamped identification plates, providing the device name. "Dymo"-type labels are not acceptable.
- b) Each BHS control operator and indicator shall be supplied with laminated, (permanently attached), corrosion proof, etched, engraved or stamped identification plates, providing the device name. The lettering shall be a minimum of 1/8" characters, using black lettering on white background.
- c) All BHS control stations shall be identified by a unique identification with a minimum of 1/4" characters, using black lettering on white background name plates. The BHS control station label shall be as follows: CS/ (Conveyor ID) – (unique number) i.e. CS/TC2-07
- d) Estop pushbutton labels shall have a red background with white lettering, providing the device name and the estop zone conveyors involved. The lettering shall be a minimum of 1/8" characters, using black lettering on white background.
- e) In addition to the manufacturer's nameplates, all BHS electrical and mechanical control devices mounted in or on the associated MCPs shall be further identified by permanently attached, corrosion-proof, etched, engraved or stamped identification plates. The BHS MCP component identification shall be provided on the back panel so that all transformers, relays, motor starters, fuses, overloads, circuit breakers, etc. can be easily identified. The lettering shall be a minimum of 1/8" characters, using black lettering on white background.

2.6.11 Control Stations

- a) Spacing between control stations shall not exceed 50 feet and shall be coordinated with the Owner (or OAR).
- b) Control stations in the non-public areas shall be painted OSHA #1016 or #1026 "Safety Yellow".
- c) The BHS contractor shall install full size (30.5mm) control station operators (i.e. pushbuttons, selector switches, indicator lights), in control stations.

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1. The control operators shall be grouped to minimize the number of operating points throughout the BHS.
 2. Control station operator functions shall be identified in the English language (using elementary terms).
 3. All control station operator identification plates shall be affixed to the console face.
 4. All visible pushbutton lights and indicators shall be LED lighted.
- d) Mount all control stations located in public areas (i.e. load belts, and curbside) flush to the equipment and provide them with Type 304, 12 gauge, #4 brushed finish, stainless steel cover plates. Control stations located in the view of the public shall not be mounted on the top surface of the conveyor front cladding.
 - e) Control Stations located in public view with hinged doors shall have industrial grade metal hinges and a lockable latch.
 - f) Provide control stations as indicated on associated drawings and specifications. Final control station locations shall be coordinated with the owner (or OAR) on the installed conveyor and associated conveyor equipment.
 1. Position control stations so they don't impede access to the equipment for operation or servicing. Locate control stations so they are clear of normal vehicular and personnel traffic lanes. Install guards to prevent the inadvertent actuation of any control device where this cannot be accomplished.
 2. Indicator lights shall not be affected by extraneous light, and shall be clearly visible in all lighting conditions
 - g) Control elements such as (but not limited to) switches, pushbuttons, indicator lights, etc., shall be easily replaceable and adequately protected from physical damage, and shall be selected for ease of operation in an "AOA" environment.
 - h) Freestanding control stations shall be mounted on extremely rugged and braced pedestals with large firmly anchored base plates. The design of this equipment shall account for extraneous loading and generally abusive conditions.
 - i) Provide independently anchored impact protection wherever MCPs, control panels, control consoles or control stations are exposed to work area traffic.

2.6.12 Photo-eyes

- a) All BHS Photo-eyes shall be identified by a unique number, which shall be located within 2" of the Photo-eye location.
- b) The BHS Photo-eye label shall be as follows: PE/ (Conveyor ID) – (unique number). i.e. PE/IB1-03
- c) Provide Photo-eyes that are self-contained, retro-reflective type with an infrared light source, a sensitivity adjustment and an LED status indicator.

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1. Retro-reflective type Photo-eyes are to be used for applications where the distance between the Photo-eye and the reflector is less than 10'.
 2. Photo-eye applications that require a scan distance of 10' or greater are to use a separate transmitter and receiver, (rather than the single retro-reflective Photo-eye).
- d) The BHS contractor shall provide AC Photo-eyes with quick disconnect cables (for ease of replacement). The cable shall be UL recognized, 18 AWG (minimum), and one piece molded design.
 - e) The BHS contractor shall mount the Photo-eyes to structural members or side guards, using an adjustable mounting bracket (supplied by the Photo-eye manufacturer).
 1. The Photo-eyes are to be mounted in a vertical, (not horizontal), attitude. The alignment and status LEDs shall be easily visible (for maintenance personnel).
 2. All Photo-eyes and cabling shall be firmly attached and protected from the associated equipment, personnel impact, maintenance personnel servicing the equipment, or personnel working in the area.
 - f) Photo-eye mounting brackets are to be directly attached to the associated conveyor structure. The use of shims between the conveyor structure and the Photo-eye mountings is not acceptable. No reflector bracket mounting penetrations through the side guards shall be acceptable. Mount Photo-eyes using hex head 1/4" - 20 bolts (of appropriate length), and related 1/4" - 20 hardware (flat washers, lock washers and nuts).
 - g) Reflectors shall be mounted to conveyor side guards using brackets that provide both vertical and rotational adjustment. No reflector bracket mounting penetrations through the side guards shall be acceptable. Mount reflector bracket using hex head 1/4" - 20 bolts (of appropriate length), and related 1/4" - 20 hardware (flat washers, lock washers and nuts). Use lock or start washer on reflector stud.
 - h) When holes through conveyor side guards are required, the holes shall be a maximum of 1.5" in diameter and located so that the center of the Photo-eye beam is 2.5" above the conveyor belt. The holes in the conveyor side guards shall be dimpled away from the baggage flow to minimize the possibility of snagging a bag and causing a jam. Oblong openings in the conveyor side guards are not acceptable.
 - i) Only one side guard opening per Photo-eye and one side guard opening per related reflector shall be acceptable. Any unused Photo-eye/reflector openings in the side guards shall be properly filled (with a welded circular blank), ground smooth and properly painted.

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- j) Photo-eyes shall be mounted on the side of a conveyor having the lesser chance of contact (by operational or maintenance personnel. The Photo-eyes are to be located on the catwalk side of conveyors to ensure maintenance access. Install guards to protect Photo-eyes (if susceptible to personnel contact).
 - k) The BHS contractor shall supply cord sets (of an appropriate length) to connect the Photo-eyes, so that there is no more than 12" of excess cable length remaining.
 - 1. The excess cable shall be coiled and secured to the associated conveyor with the use of appropriate cable mounting clips.
 - 2. The BHS contractor shall not use plastic cable ties to secure the cord sets.

2.6.13 Visual & Audible Warning Devices

- a) The BHS contractor shall provide low profile, UL listed, polycarbonate industrial rotating or flashing beacons for start/fault/estop warnings at MCPs and claim devices. These devices shall be 120 VAC, Edwards 51 series beacons with horn (or approved equivalent).
- b) Warning devices to be used in public areas shall be coordinated and approved by the owner.
- c) The BHS contractor shall provide Mallory-Sonalert 30 mm Piezoelectric (or approved equivalent) audible start warning at the load belt conveyors (public and non-public). The load belt audible start warning devices shall be rated at least 60 dB at 3 feet.
- d) Allen Bradley 855 or similar IP65 stack lights shall be used for remote locations for start/fault and estop visual and audible warnings.

2.6.14 Motor Starters

- a) Motor starters shall be NEMA Rated, (if Project required) 3-Pole, 480V, with 24VDC or 120VAC Starter Coil Voltage, magnetic across-the-line contactors, each with a holding contact and auxiliary contacts.
 - 1. The auxiliary contact shall provide an input to the PLC (24VDC or 120 VAC).
 - 2. Motor starters shall each have three manual-reset, thermal-overload relays.
 - 3. Starters shall incorporate thermal overload protection in all phases.
 - 4. The BHS minimum motor starter size shall be NEMA size "0"
- b) NOTE: Equivalent IEC motor starters are acceptable when using corresponding Motor Protector Switches (MPS's)

2.6.15 Variable Frequency Device (VFD)

- a) The BHS contractor shall provide programmable Variable Frequency Devices (VFDs) to control the operation of three phase induction AC motors for merges,

queues and all other conveyors that require bag tracking at a minimum, unless otherwise stated in the contract drawings motor list.

1. All VFDs shall be configured to be controlled and programmed via the PLC.
 2. Dynamic braking shall be provided for all the conveyors within the BHS bag tracking zones. Provide dynamic braking resistors where required for faster stopping.
 3. Provide an electric brake, wired separately from the VFD power source, for decline conveyors, that bags are being tracked on, (to prevent conveyor coasting).
 4. VFD controlled incline conveyors, that bags are being tracked on, shall have provisions on the associated gear box (to prevent conveyor coasting).
- b) VFDs shall be installed within the associated Motor Control Panels (MCPs) or at each associated motor.
1. All VFDs utilized by the BHS shall be UL listed and IEC compliant.
 2. Provide a local keypad control for start, stop, and speed reference. Provide the ability to program and monitor all drive parameters. Provide programming devices with pre-programmed parameters for various types of systems.
 3. All VFD faults shall be enunciated and logged, regardless of whether or not they have been automatically reset.
- c) VFDs shall be capable of performing the required engagement cycles per minute for the specific application (under full load conditions) with no objectionable heating, overload tripping or other VFD nuisance faults.
1. The BHS contractor shall factor this in and provide VFDs and dynamic braking resistors with a larger power rating (if required).
 2. The BHS contractor shall factor in heat dissipation when designing the MCPs. If excessive heat is anticipated from the braking resistors, then mount the resistors in a separate NEMA 12 enclosure (for interior equipment).
 3. If the control transformer that is powering the associated MCP is greater than 10 times the drive rating, provide an input line reactor for each AC drive.
- d) VFD rated shielded cable shall be installed when VFD's are used.
1. The type of cable shall be Belden, ÖLFLEX or approved equivalent.
 2. The shield shall be connected to both the motor and the PE (Potential Earth) ground on the AC drive.
 3. For cable lengths greater than 100 ft., a minimum of two (2) amps needs to be added to the drive rating (for cable charging current).

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- e) VFD enclosures (when used) shall allow maintenance personnel to see the status display (without opening the enclosure) through a transparent NEMA rated window at the front of the enclosure.

2.6.16 Control Transformers

- a) The BHS contractor shall provide 480/120-volt, single phase, 60-Hz, (with minimum 20% spare capacity), dry type, core and coil type transformer, with terminal board and secondary fuse kit.

2.6.17 Control Relays

- a) Control Relays shall have a 120-volt AC coil rating, and each relay shall have a minimum of four NO/NC contacts rated at 600 volts, 10 amps. Provide surge suppressors on control relay coils.
- b) Interface Relays shall use a relay socket that shall accept both 120VAC and 24VDC relays (to allow flexibility for interface connections).
- c) All timing functions shall be accomplished through the associated PLC programming. Pneumatic timing relays are not acceptable, unless required for a specific operation, or on small systems using relay logic. The use of "latching relays" is not acceptable.

2.6.18 Data Cabling

- a) BHS Data Cables shall be installed in cable trays or conduit and shall not be attached to any BHS conveyors and/or associated equipment.
- b) BHS Data Cables shall not be run in wire way or conduit with power cables.

2.7 BHS CONTROL SYSTEM DESIGN

2.7.1 General Design Requirements

- a) This functional specification is intended to define the design and functional requirements of the control system. The definitive architecture and design is the responsibility of the BHS contractor and is subject to review and approval by the Owner (or OAR). The BHS design shall be a complete operational system as outlined or illustrated in the Contract Documents. The work shall be phased and completed in a manner that shall not adversely impact Airport operations.
- b) The BHS contractor shall coordinate and provide any required interfaces to the BHS Computer System (if applicable) with the Owner (or OAR).
- c) The Control System consists of new PLC control systems. All the BHS conveyors and subsystems are controlled by new PLC's and I/O chassis adhering to current BHS industry technology.

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- d) The BHS contractor shall clearly identify the concept on which this proposal is based and identify in detail the proposed control system architecture, the major components to be utilized and the concept employed for software development.
 - e) Submittal of the proposal shall acknowledge the functional intent of the control system specification. The design shall be the result of modifications and/or refinements established herein. These changes shall not be the basis for increased cost requests.
 - f) The BHS contractor shall complete and submit, for the Owner's (or OAR's) review and approval, a comprehensive and detailed functional specification. This description shall include full details of operational procedures and control system provisions associated with the BHS, including but not limited to the following:
 - 1. Control system development and implementation master schedule
 - 2. Schedule of system hardware employed (main elements)
 - 3. Start-up/Shut-down procedures
 - 4. Description of conveyor control logic outlined by subsystem
 - 5. Audio/Visual indications
 - 6. Control station layouts/functions/operations
 - 7. Power supply requirements
 - 8. BHS Computer operator interface routines
 - 9. Proposed overall control system architecture diagram.

2.7.2 Controls Meetings

- a) The BHS contractor shall make allowance in the proposal to attend a minimum of one (1) control system meeting.
 - 1. The meeting may be virtual, at the job site or the Owner's office to review the Control System Functional Specifications and Electrical Control System design.
 - 2. The meeting shall review the following discussion items. Material to be reviewed at the meetings shall be supplied by the BHS contractor at least two (2) weeks prior to the meetings.
 - 3. The control system meetings attendance shall include representatives from the BHS contractor, and the Owner (or OAR).
- b) BHS Design Review
 - 1. BHS Power Requirements, UPS requirements, MCP sizes
 - 2. The Baggage Handling System Interfaces (Fire & Security)
 - 3. Computer and PLC System Architecture

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- I. BHS Computer Interface Requirements
 - II. Hardware Requirements
 - III. Software Requirements
4. Subsystem control functions. As a minimum review the following:
 - I. Start-up/Shut-down Procedures
 - II. Jam Detection and "Restart" Procedures
 - III. Cascade Stop Operation
 - IV. Emergency Stop and "Restart" Procedures
 - V. Audio/Visual indications and locations
 - VI. Fire/Security Doors
 - VII. Security Card Swipe and Keypad Interfaces
 - VIII. General Control Logic per Subsystem
 5. Electrical System Drawing Review
 6. Maintenance Diagnostics System (MDS) Review
 - I. Graphic screens and Interfaces
 - II. Problem Resolution

2.7.3 PLCs

- a) The BHS Integrator shall be responsible for the PLC and IO allocations and design, providing a fully functional control system that adheres to the requirements of this specification and the PGDS (if applicable).
- b) The control system PLCs will interface with the following types of equipment:
 1. BHS field devices such as but not limited to motors, sensors, scanners, and encoders.
 2. MDS computers and BSDs.
 3. Building security and fire systems
- c) All PLC's interface modules and I/O cards shall be located in MCP cabinets as specified herein. Commonality of PLC manufacturers shall be maintained utilizing the minimum number of individual models.
- d) The BHS PLCs shall be Allen Bradley ControlLogix using the most current stable version available at time of product data submission.
- e) The PLC system shall be provided with a minimum of:
 1. 24VDC or 120 volt AC power supply
 2. 24VDC and 120 volt I/O modules

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3. EEPROM module if not built into the PLC module
 4. 25% spare memory
 5. Minimum of 25% spare I/O capacity
 6. Remote I/O communications capability
- f) Provide PLC system with Ethernet capability for connection to external devices.
 - g) Input/output (I/O) modules shall have a visual indication of the status of each I/O point. The status displayed shall be for both signals input into each I/O module and the output signal from each I/O module
 - h) All PLC's shall employ an internal battery back-up system capable of storing data for a minimum period of 15 minutes, should a power outage occur.
 - i) Provide a fully annotated software copy of the up-to-date PLC software and program at the time of testing.

2.7.4 Maintenance Diagnostic Systems:

- a) MCP mounted standalone MDS are required on the door of each MCP for maintenance diagnostic support of the conveyors being controlled. The MDS will show a graphic depiction of the conveyors and devices being controlled by the MCP using an industry standard status color scheme. Each HMI will have off-the-shelf maintenance diagnostic software such as Allen Bradley FactoryTalk or equivalent that will monitor the equipment being controlled by the MCP in which it is installed.
- b) The MDS shall provide future capability for remote viewing of alarms and graphics remotely via VNC or other technology to be coordinated with, and approved by, the owner or OAR. The HMI shall provide, at minimum, the ability to transfer alarm data to a USB electronic media (thumb drive).
- c) Provide Allen Bradley Panelview Plus 8 or industrial rated panel PC (minimum 15").

2.7.4.1 BHS Maintenance Diagnostic System (MDS)

- d) The BHS contractor shall provide a diagnostic system, for use by trained operations and maintenance employees, to accomplish the following at a minimum:
 1. Display and locate any system malfunction or failure through text and graphic simulation of the entire system and text display.
 2. Visually monitor the sortation system operational configuration, including conveyor flow direction, operational status (On/Off, E-Stop, Overload, etc.) and operating mode (cascade, indexing, etc.).
 3. Identify location and cause of equipment failures.

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4. Initiate fallback procedures. Submit fallback procedures to the Owner (or the OAR) for approval.
 5. Display status of fire/security doors (open, closed, malfunctioning, etc.).
- e) The MDS shall identify the following conditions (this listing is not to be construed as being all inclusive):
1. Emergency Stop Actuated (identify location)
 2. Motor Overload Tripped (identify location)
 3. Excessive actuation time of a conveyor sensor (other than in a normal queue/accumulation condition) to identify a probable jam condition or similar operational problem (identify location).
 4. Photoeye failure (identify location)
 5. System configuration (Mode of Operation)
 6. Operational status
 7. Failure of tracking encoder/pulse generator
 8. Over Temperature Warning for any computer or PLC cabinets
 9. Fire Alarm System Faults (if the BHS is tied to the fire system for local code compliance)
- f) Configure diagnostic system with various color-coding schemes to differentiate between:

Condition	Color
Normal Operation - Conveyor Drive On	GREEN
Normal Operation - Conveyor Drive Off/ Timed Out	BLACK
Conveyor stopped due to "Cascading"	MAGENTA
Conveyor Full Condition	WHITE
Emergency Stop Actuation	RED
Overlength/Overheight	FLASHING WHITE
Motor Overload	BLUE
Conveyor Jam Condition	YELLOW
EDS Device Failure	RED
Equipment Out of Service	BROWN

- g) Provide the capability to archive all records of statistical data on a USB thumb drive.

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- h) The MDS (with authorized access) shall have the capability to render individual subsystems, check-in counter conveyors, and conveyors of the baggage system available or unavailable.
 - i) The MDS system designed and installed by the BHS contractor shall be such, that the Owners maintenance personnel can easily modify/add subsystems, display faults, modify/add reports etc. in the event that additional/modified subsystems are installed as part of any future project (i.e. very user friendly).
 - j) The MDS shall also provide a list of time stamped active alarms, as well as the ability to scroll through historical alarm lists (minimum 30 days). The MDS shall provide summary reports for equipment faults that include total counts, time faulted and percentages, by individual equipment.

2.7.5 Responsibility for Programming

- a) The BHS contractor shall modify and/or upgrade the PLC programs for the Baggage Handling System PLC's for all functions associated with the Project.
- b) Coordinate the control system interfaces between the BHS and any other required associated system.
- c) Program all monitoring system functions, associated with the BHS Project. These functions shall include the provision of audible and visual system alarms at the Control Room.
- d) Programming techniques, data structures, and documentation shall be acceptable to, and approved by, the Owner (or OAR). The system software shall be written using as much non-proprietary software as possible.
- e) The BHS contractor shall supply the Owner with the as-built programming documentation for the PLC's as follows:
 - 1. Two complete (duplicate) CD, DVD or other approved media covering all applicable computer, PLC and system monitoring programming documentation, and two complete (duplicate) sets of hard copy documentation.
 - 2. A copy of the pre-assembled Software for the BHS computer systems and the BHS PLC control system, (including all PLC ladder logic) shall be provided in software versions.

2.8 BHS FUNCTIONAL REQUIREMENTS

2.8.1 General Requirements

- a) The Contract Drawings show the locations of the associated MCPs.
- b) The BHS contractor shall provide the design and installation of all control systems, integration software, and programming (in accordance with the sequence of operations) for the BHS, as described in the contract documents in

addition to the normal BHS logic and controls. The TSA – “PGDS” requirements, (latest version) shall be used as a guide.

- c) The BHS contractor shall provide “dry contacts” to interface with the Security Access Control System (SACS). When activated, the associated control station Start pushbuttons shall be enabled.
- d) The BHS contractor shall provide “dry contacts” to interface with the building fire alarm system. If activated, the associated conveyors shall shut down and the corresponding fire/security doors shall close.

2.8.2 Pre-Start Conditions

- a) The BHS MCP and/or associated PLC cabinet main disconnects shall be in the “ON” position.
- b) No E-Stops are depressed in the associated zone.
- c) No E-Stop Resets are required in the associated zone
- d) No motor overloads, motor protector switches, or disconnects are tripped (or in “off” position) in the associated zone. Start-up is not inhibited by conveyor disconnects for devices having multiple drives like slope plates.
- e) No BHS motor safety disconnects are in the “OFF” position in the associated zone.
- f) No jams are present in the associated zone.
- g) No oversize or out-of-gauge conditions are present in the associated zone.
- h) No building fire alarm signal is detected within the associated zone.
- i) No heat/smoke detector is activated within the associated zone.
- j) The System Enable keyswitch on the associated MCP shall be turned “On”.
- k) Existing ticket counter, inbound load belt, and door access control systems are to remain in place and be reused to operate the new BHS.
- l) The Control Room and/or load belt keyswitch is in the “Enable” position (where applicable).

2.8.3 Start Up Procedure

- a) Prior to starting any BHS conveyors, all the applicable pre-start conditions shall be met.
- b) The normal system start is accomplished by enabling the start pushbuttons at the associated load belt conveyor by activating the Access Control.
- c) After Access Control has been activated, depressing the Start pushbutton at the associated load belt control station activates the start warning alarms and opens the associated fire/security doors.

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- d) When the start warning alarms expire (after a time delay) and the associated fire/security doors are fully open, the corresponding conveyor system shall start, beginning with the furthest downstream conveyor.

2.8.4 Start Warning Alarm Sequence

- a) The BHS contractor shall provide rotating beacons and audible horns as start warnings alarms in the areas specified.
- b) The BHS contractor shall provide start warning alarms which shall activate on initial start-up, or by depressing a restart pushbutton to reset/restart the stopped conveyors, after a system fault (jam reset, E-stop reset, etc.)
- c) Depressing a start pushbutton at the load belt conveyor (after access is acquired) shall signal the associated fire/security doors shall raise.
- d) The start warning alarms shall activate for a predetermined amount of time (typically 8 seconds). After the start warning alarm expires and no faults are detected in the system, the associated conveyor system shall start, including the respective makeup or claim devices (if applicable).
- e) The BHS load belt conveyors shall not start until the associated fire/security doors are fully open.

2.8.5 Fault Beacons / Audible Alarms

- a) Beacons and audible alarms for start-up, fault conditions and emergency stops will be activated at the MCP and remote locations that are isolated audibly and visibly from the MCP. Coordinate location of remote stack light alarms with the owner to best provide for safety and maintenance response.
- b) The BHS contractor shall provide fault beacons and fault alarms for the following at a minimum:
 - 1. Photo-eye Jams
 - 2. Oversize or Out-of-Gauge bag detected (if applicable)
 - 3. Overload or MPS tripped
 - 4. Motor Safety Disconnect off
 - 5. E-Stop activated
 - 6. Failsafe detected (if applicable)
- c) When a fault is detected, the amber alarm beacon shall activate and the audible alarm shall sound. The duration of the audible alarm shall be predetermined. The illuminated amber fault beacon shall remain activated until the affected fault has been cleared and reset.
- d) The illuminated red E-Stop beacon shall remain activated until the affected E-Stop has been cleared and reset.

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- e) The audible fault alarm shall have a unique sound that is different from the normal start warning alarms. The fault alarm may be silenced (but not cleared) via the "Alarm Silence" pushbutton at the associated MCP.
 - f) Whenever a BHS fault is detected, the fault alarm at the associated MCP shall activate and a corresponding indicator light shall be illuminated as follows:
 - 1. Jam or other fault – Amber
 - 2. Motor Overload – Blue
 - 3. Emergency Stop – Red
 - g) Remote mounted indicators and warnings shall be installed the design drawings.
 - 1. Oversize or Out-of-Gauge – White Illuminated Button (local control Station)
 - 2. Failsafe detected – Blue Stack Light (near failsafe detection PEs)
 - 3. Screening Status – Green (clear), Red (Alarmed) Typical Control Stations
 - a) Start/Stop Control Stations shall be located on a stanchion or wall mounted load belt conveyors. Typically located at ticket counter, curbside and inbound claim feed load belts. These control stations shall include the following control devices:
 - 1. Start: Illuminated Green Pushbutton
 - 2. Stop: Non-illuminated Red Pushbutton
 - 3. Oversized: Illuminated White Indicator
 - 4. Fault: Illuminated Amber Indicator
 - 5. Start Alarm: Audible Warning Buzzer
 - 6. E-Stop: Illuminated Red, Lockable, Push-Pull
 - b) Control stations shall be installed adjacent to each associated fire/security door, (on the secure side) which shall contain the following control devices:
 - 1. Maintenance/Auto: Key Switch
 - 2. Door Open: Non-illuminated Black Pushbutton
 - 3. Door Close: Non-illuminated Black Pushbutton
 - 4. Re-Start: Illuminated Green Pushbutton
 - 5. E-Stop: Illuminated Red, Lockable, Push-Pull
 - c) The control stations provided at Jam Reset/Restart locations shall include the following control devices:
 - 1. Jam: Illuminated Amber Indicator Light
 - 2. Re-Start: Illuminated Green Pushbutton
 - 3. E-Stop: Illuminated Red, Lockable, Push-Pull

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- d) Operator control stations provided at Claim and Makeup devices shall include the following control devices:
 - 1. Re-Start: Illuminated Green Pushbutton
 - 2. E-Stop: Illuminated Red, Lockable, Push-Pull
 - e) Maintenance control stations provided near the drive units of a Claim or Makeup device shall include the following control devices:
 - 1. Auto/Maint.: Two (2) Position Keyswitch
 - 2. Jog: Momentary Contact Pushbutton
 - 3. Re-Start: Illuminated Green Pushbutton
 - 4. E-Stop: Illuminated Red, Lockable, Push-Pull
 - f) Bag Inspection control stations provided at the BIS locations shall include the following control devices:
 - 1. E-Stop: Illuminated Red, Lockable, Push-Pull
 - g) The control stations provided at the MCPs shall include the following control devices:
 - 1. System Enable: Two-position Keyswitch
 - 2. System Start: Illuminated Green Pushbutton
 - 3. Fault Reset: Illuminated Blue Pushbutton
 - 4. Lamp/Alarm Test: Non-illuminated Gray Pushbutton
 - 5. Alarm Silence: Non-illuminated Yellow Pushbutton
 - 6. Emergency Stop: Illuminated Red Pushbutton

2.8.6 Fire/Security Doors

- a) The BHS contractor shall provide a door obstruction Photo-eye to detect bags under the associated fire/security doors. This Photo-eye may also be used for autostop and/or overlength detection.
- b) The BHS contractor shall provide an externally mounted Photo-eye, so that the "fully open" position of the door is detected. If the door is sensed to not be in the fully open position, the associated conveyor shall be stopped (if it is running) or shall not be permitted to start if the conveyor is not already running.
- c) The BHS contractor shall provide an externally mounted Photo-eye, so that the "fully closed" position of the door is sensed. If the door is sensed to not be in the fully closed position, an indication shall be sent to the system fault monitoring system.

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- d) PLC I/O or PLC network interfaced obstruction, open, closed Photo-eyes that are provided by the door manufacturer will be acceptable. Door manufacturer provided Photo-eyes must adhere to the requirements of this spec.
 - e) The BHS contractor shall provide Interface connections and test the fire/security doors interfaces with the building fire/security system for the doors status.
 - f) The BHS contractor shall program the fire/security doors to operate as follows:

2.8.6.1 Start Functions:

- a) Fire/Security doors located at load belt inputs and curbside load areas shall require a Security Access Control permissive signal and Keypad activation to enable the corresponding Start pushbutton.
- b) After depressing the respective Start pushbutton, and while the start warning alarms are being activated, the associated fire/security doors shall open.
- c) The BHS PLC shall send the doors status to the Building Security System.
- d) This condition shall be indicated on the MDS.

2.8.6.2 Stop Functions:

- a) After depressing the Stop pushbutton at the load belt control station, the associated load belt conveyors shall run for a sufficient time to ensure all the bags have been transported past the associated doors.
- b) The load belt conveyors shall stop and the fire/security door shall close.
- c) The BHS PLC shall send the door status to the Building Security System.
- d) This condition shall be indicated on the MDS.
- e) If the door clear Photo-eye detects a bag under the associated door, the conveyors continue to run until the Photo-eye is clear, and then close the door.

2.8.6.3 Fire Detection:

- a) The BHS provided "dry contact" closes and gives an input signal to the PLC to shut down the associated system.
- b) If no bag is detected under the door (by the door clear Photo-eye), all the associated conveyors shall stop and the door shall close.
- c) If a bag is detected under the door (by the door clear Photo-eye), the conveyors continue to run until the Photo-eye is clear, and immediately stop the upstream and downstream conveyors.
- d) If the door is unable to close upon detection of a fire signal or system stop signal, a fault alarm shall be activated at the associated MCP.
- e) This condition shall be indicated on the MDS.

2.8.6.4 Fire/Security Door Control Station:

- a) A fire/security door control station shall be installed adjacent to each fire/security door for maintenance personnel use only (not accessible from the public side).
- b) When the Maintenance/Auto keyswitch is in the Maintenance position, the "door open" and "door close" pushbuttons are enabled.
 - 1. Associated conveyor systems are not active when the Maintenance Mode is activated.
 - 2. Activation of the load belt Security Access Control is not required to enable the Maintenance Mode.
- c) All the powered fire/security doors shall be equipped with a Manual Release Mechanism (to permit the disengagement of the door drive unit) so that the door can be either raised or lowered manually via pull chain.

2.8.7 Photo-eye Functions

- a) Photo-eyes shall be provided to perform the required control system sensor functions. The BHS contractor shall combine Photo-eye functions (for efficiency), provided that all proper control functions are maintained.

2.8.7.1 AutoStart

- a) The BHS contractor shall provide autostart Photo-eyes upstream of sections of transport conveyors not specifically controlled by start/stop switches. The same Photo-eye may be utilized to control both the autostart and autostop circuits. The autostart circuits shall be programmed to start a string of conveyors whenever an autostart Photo-eye is blocked.
- b) Before starting any BHS conveyors, audible start up warning alarms shall be actuated in the area affected. Activation of the start warning alarms shall be through the PLCs. The start warning alarms shall sound for a predetermined time period and then the associated conveyor subsystem shall start.
- c) Each conveyor in the subsystem shall be started in reverse sequential order starting from the last downstream conveyor to the first upstream load conveyor, with a short delay between each motor starter actuation. This condition shall be indicated on the MDS.

2.8.7.2 AutoStop (Time-Out)

- a) Autostop Photo-eyes shall be provided upstream of sections of transport conveyors not specifically controlled by start/stop switches. The same Photo-eye may control both the autostart and the autostop circuits. If a BHS conveyor stops for any reason, the autostop timer shall reset and hold until the conveyor restarts.

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- b) The autostop circuits shall be programmed to stop a string of conveyors. If the auto stop Photo-eye does not detect a bag for a certain time period (adjustable in the PLC). This condition shall be indicated on the MDS.

2.8.7.3 Overheight Detection

- a) The BHS contractor shall provide Overheight detection Photo-eyes at every outbound BHS input (ticket counter and curbside) and inbound belt feed conveyors to detect bags that are too high to clear the lowest downstream obstruction. The overheight detection Photo-eye shall be set at 36" above the top of the conveyor belt, (unless otherwise stated).
- b) Provide an overheight indicator lamp in the associated control station, (this lamp may be the same unit as that for overlength detection).
 - 3. When the conveyor is running and the overheight detection Photo-eye is blocked by a bag, the associated conveyors shall stop.
 - 4. The oversize indicator lamp shall illuminate in the associated control station. A fault condition will be indicated at the MCP.
 - 5. This condition shall be indicated on the MDS.
- c) Resetting the overheight condition requires the following sequence:
 - 6. Actuate the associated E-stop pushbutton in the adjacent control station
 - 7. Remove the bag that is blocking the Photo-eye. The oversize indicator lamp shall flash.
 - 8. Press the start/restart pushbutton in the adjacent control station. The stopped conveyors shall restart (after start warning). The oversize indicator lamp shall extinguish

2.8.7.4 Cascade Stop

- a) Provide a head end (cascade stop) Photo-eye within 12" of the discharge ends of all straight conveyors and 6" on power turns and queue conveyors. The center of the Photo-eye beam is approximately 2.5" above the top of the conveyor belt.
- b) When a downstream conveyor stops as a result of a fault condition, the conveyor immediately upstream of the stopped conveyor continues to run until the corresponding head end Photo-eye is blocked.
 - 1. When this occurs, the associated conveyor shall stop. The preceding upstream conveyor shall run until its head end Photo-eye is blocked.
 - 2. This cascade stop function shall continue through the upstream conveyors until the jam/failure is cleared or the first conveyor in the subsystem has stopped. This condition shall be indicated on the MDS.

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- c) The cascade stop logic shall initiate the associated load belt's Start pushbutton "Green light" to flash when the respective system or subsystem has cascade stopped (all the way upstream to the load belt).
 - d) Conveyors that cascade stop as a result of a jam, or other fault condition shall be "held stopped" through PLC logic until the jam or other fault condition is reset, and the conveyors have been restarted.
 - e) The head end (cascade stop) Photo-eye shall also be utilized for jam detection, but no control station shall be installed in conjunction with this Photo-eye. Upon the detection of a jam at this head end (cascade stop) Photo-eye, initiate the following steps:
 - 1. Stop the corresponding conveyor with the cascade stop Photo-eye and the conveyor immediately downstream.
 - 2. The fault alarm at the associated MCP shall be activated. The jam indicator light shall illuminate in the nearest associated jam reset/restart control station.
 - 3. This condition shall be indicated on the MDS.

2.8.7.5 Jam Detection

- a) Locate (head end) jam Photo-eyes to provide for operation of jam detection circuits within 12" of the discharge ends of all straight conveyors and 6" on power turns and queue conveyors. The center of the Photo-eye beam shall be 2.5" above the top of the conveyor belt.
- b) Whenever a conveyor stops for any reason, the jam detection timer shall reset and hold until the conveyor restarts.
- c) At a minimum, provide jam detection Photo-eyes and a Jam illuminated pilot light, an illuminated Restart, pushbutton, and an illuminated Emergency Stop push-pull switch (in a control station in areas that have a relatively high frequency of jams). These locations shall include:
 - 1. The discharge ends of all conveyors feeding onto power turns,
 - 2. At the bottom of declines and top of incline conveyors,
 - 3. At all merges for both the primary and secondary lines,
 - 4. Every other conveyor, on queue conveyors, and on long strings of conveyor lines.
 - 5. Any other location where a potential jam point exists.
- d) When the conveyor is running and the associated Photo-eye is blocked for longer than an adjustable timer, in the PLC, (6 seconds adjustable), a jam condition is detected. The following things shall occur:

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1. The conveyor with the blocked jam detection Photo-eye and the conveyor immediately downstream shall stop.
 - I. If the jam Photo-eye is located on a conveyor that feeds onto a power turn, the conveyor with the jam detection Photo-eye, the power turn and the conveyor immediately downstream of the power turn shall stop.
 - II. If the jam Photo-eye is located on a merge conveyor the merge belt shall stop and the next conveyor downstream shall stop.
 2. The fault alarm shall sound at the associated MCP. The jam indicator light in the nearest associated control station shall illuminate.
 3. This condition shall be indicated on the MDS.
 4. All conveyors upstream of the stopped conveyors shall cascade stop and be 'latch stopped until the downstream conveyors restart.

2.8.8 Jam Indication and Restart

- a) The BHS contractor shall provide an illuminated amber Jam pilot light (in a control station along with an E-Stop pushbutton and a green illuminated Restart pushbutton) adjacent to all jam detection Photo-eyes. The control station shall be painted OSHA #1016 or #1026 "Safety Yellow".
 1. The Jam light shall illuminate solid when the jam detection Photo-eye senses a jam condition. An audible fault alarm shall sound at the associated MCP.
 2. This condition shall be indicated on the MDS.
- b) To restart the stopped conveyors and extinguish the associated lights and alarms perform the following sequence:
 1. Actuate (push in) the associated adjacent Emergency Stop pushbutton (the E-Stop indicator lamp shall illuminate flashing)
 2. Remove the jammed bag and verify that the Photo-eye is clear.
 3. The illuminated Jam light shall flash (indicating that the jam Photo-eye is clear and the stopped conveyor is ready to restart).
 4. Reset (pull out) the associated Emergency Stop pushbutton (the E-Stop indicator lamp shall extinguish).
 5. Depress the illuminated green Restart pushbutton (the light shall extinguish and the stopped conveyors shall restart after the start warning alarm sequence)
- c) The BHS contractor shall paint the control station enclosures in non-public areas with OSHA #1016 or #1026 "Safety Yellow" paint and label with the conveyor Item Designations of the conveyors being controlled in 1/2" high block letters.

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1. Jam detection control stations shall be placarded with the BHS conveyor designations that are being controlled.
 2. Most of the control stations shall be located adjacent to the conveyors under control and accessible only to personnel clearing the jam.
 3. Note: All such control stations shall be located on the catwalk side of conveyors that are equipped with catwalks.

2.8.9 Motor Overloads

- a) The BHS contractor shall size the motor overload heaters based on the actual motor "nameplate rating", (but shall not exceed 115% of the full load amps).
- b) If any BHS conveyor motor draws excess current, appropriate protection shall be provided to isolate the supply to all the subsystem elements (VFD controlled belts shall perform this function within the VFD functionality).
 1. A single "motor overload" indicator is provided on an MCP. This indicator shall illuminate when any motor overload trips in the subsystem being controlled.
 2. This condition shall be indicated on the MDS.
- c) After rectification of the cause of the motor overload to trip, and after manually resetting the overload heater element in the associated MCP, the system may be restarted by actuation of the MCP Restart pushbutton. The motor overload indicator shall be extinguished and normal control shall resume (after start warning).
- d) In the event of an individual conveyor motor overload trip, all of the upstream conveyors shall revert to cascade stop mode, while all the downstream conveyors shall continue to run in the normal mode of operations.

2.8.10 Emergency Stop Pushbuttons

- a) Provide Emergency Stop (E-Stop) pushbuttons to ensure that operating and maintenance personnel can easily and quickly reach an E-Stop pushbutton anywhere in the system.
- b) Ensure that E-Stop pushbuttons are installed, at a minimum, in the following locations:
 1. Around the perimeter of all makeup and claim devices.
 2. At each end of load/unload conveyors.
 3. Along lengths of conveyors, at a maximum of 50' apart.
 4. In each jam indication control station.
 5. In each maintenance control station

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- c) All Emergency Stop pushbuttons for a single subsystem shall be wired in series with the coils of one or more emergency stop relays.
 - 1. Provide the normally open contacts of the relays (in series) to be the power source of the associated PLC output modules controlling the conveyors in the subsystem.
 - 2. The BHS PLC shall not be required to remove power from the associated conveyors for an emergency stop condition.
 - d) When developing E-Stop zones, the BHS contractor shall take into consideration the following
 - 1. Consideration shall be given to the MCP breaks. If the downstream MCP is shut down, upstream bags that are left in the system shall be able to be manually removed prior to the equipment that is inoperable.
 - 2. The 45-degree merge E-Stops shall be tied into the receiving (take-away) conveyor.
 - 3. The activation of an E-Stop pushbutton shall not close any powered fire/security door within the same zone of the E-Stop pushbutton.
 - e) When an Emergency Stop pushbutton is actuated, the following shall occur:
 - 1. The associated conveyors in the subsystem shall stop,
 - 2. The lamp in the head of the pushbutton shall illuminate flashing.
 - 3. The other E-Stops in the same zone shall illuminate solid.
 - 4. The red Emergency Stop fault beacon shall illuminate at the MCP.
 - 5. This condition shall be indicated on the MDS.
 - f) To restart the stopped conveyors and extinguish the indicator lamp and MCP fault light, perform the following sequence.
 - 1. Reset (pull out) the actuated E-Stop pushbutton.
 - i. The associated E-Stop light shall shift from flashing to solid.
 - ii. The other E-Stops in the same zone extinguish.
 - 2. Depress the illuminated flashing green Restart pushbutton.
 - i. The indicator lamp and MCP fault beacon extinguish.
 - ii. The stopped conveyors restart, after start warning sequence.
 - g) When the conveyor control station Restart pushbutton is actuated, the start warning alarms are activated and, (after a delay), all of the associated stopped conveyors in the subsystem will start.
 - h) All E-Stop activations shall be reported both visually (beacon) and audibly (fault alarm bell) on the associated MCP.

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- i) This condition shall be indicated on the MDS.

2.8.11 Alarm Silence

- a) An alarm silence (momentary contact) pushbutton shall be provided on the door of the associated MCP.
- b) When this pushbutton is depressed, it shall silence the audible fault alarm. The control circuitry shall allow for multiple faults to always sound the associated fault warning alarm. Any additional faults occurring after the alarm has been silenced shall again cause the fault warning alarm to sound.
- c) The illuminated fault indicators are not extinguished until the fault has been corrected.

2.8.12 Advance/Jog

- a) The advance (bag advance) pushbutton function applies in situations where powered conveyors end at a non-powered conveyor, such as a roller conveyor, where operator reach or other ergonomic factor dictates the need. The corresponding conveyor will run while the pushbutton is being pressed and the conveyor is enabled (not faulted or estopped).
- b) The jog pushbutton is typically used for maintenance functions for a flat plate or slope plate conveyor. The corresponding conveyor will run while the pushbutton is being pressed and the conveyor is enabled (not faulted or estopped) and in maintenance mode.

2.8.13 Hand-Off-Auto (HOA)

- a) An HOA is a three position selector switch implemented for each drive with the following functions:
 1. (H) In the "Hand" position, the conveyor will run regardless of a jam condition, or conditions of surrounding conveyors. This will not in any way override an Estop since these are hard wired.
 2. (O) In the "Off" position, the conveyor will stop and be prevented from running even if conditions allow otherwise.
 3. (A) In the "Auto", the conveyor will be placed under the normal automatic control of the PLC.
- b) HOAs can be implemented as a hard wired control station located near the drive, or as soft control implemented at the HMI. When implemented as a soft control, this function shall only be usable in conjunction with a "Maintenance" user login or supervisor with a proper warning and 2 step initiation. Coordinate with the owner for HOA requirements.

PART 3. - EXECUTION

3.1 BHS FABRICATION

- a) Fabricate equipment using steel that is clean and free from rust, rust pits, kinks and sharp bends. Use forming methods that shall not fracture or otherwise damage the metal.
- b) Remove burrs, sharp edges, and sharp corners. Smooth all joints and round all corners. Align joints in components to ensure smooth conveyance of baggage.
- c) When two sections of conveyor bed meet, these joints shall be chamfered to ensure that there is no step-up condition between bed sections.
- d) Holes in metal side guards for Photo-eyes and reflectors are to be "punched", not burned, and tapered from the inside (wide) to the outside (narrow).

3.2 BHS MATERIAL REQUIREMENTS

- a) Hot-rolled sheets and coils shall conform to ASTM A-569.
- b) Structural steel plates shall conform to ASTM A-36.
- c) All welding electrodes shall conform to AWS A-5.1.
- d) The standard AWS Code for Arc and Gas Welding in Building Construction shall be used as a guide for general procedures, and qualification of welders.
- e) All BHS fasteners shall conform to ASTM A-325 (Class 2A thread fit for bolts, and Class 2B thread fit for nuts).
- f) All fasteners shall be zinc-plated or approved equal. All fasteners shall be locked with locknuts, or lock washers.
- g) Stainless steel fasteners shall be provided for stainless steel components, and galvanized fasteners for exterior components.
- h) Steel that is used in the fabrication of the BHS equipment shall be free from rust, rust pits, kinks, burrs, and sharp bends.
- i) The forming of material shall be accomplished by methods that shall not fracture or otherwise damage the metal.
- j) All parts shall be formed and cut properly to assure uniformity. All burrs, sharp edges, and sharp corners shall be removed. All joints shall be smooth and all corners rounded.

3.3 BHS MECHANICAL INSTALLATION

3.3.1 General

- a) The BHS contractor shall comply with all OSHA standards for conveyor installation, catwalk and platform installation, and safety and health regulations

for construction, along with all applicable local safety and construction guidelines.

- b) Complete all work during Airport's specified working hours in order to not interrupt, disrupt, or inconvenience any Airport operations and/or Airline passengers. It is the BHS contractor's responsibility to verify all the existing field conditions, (prior to bidding this work).
- c) The BHS contractor shall reinstall any Airline, TSA or Airport owned equipment that may have been temporarily relocated and/or removed during the installation of the new baggage handling systems. This includes, (but is not limited to), such items as desks, work benches, lockers, planning sheet stands, load sheet stands, writing tablet stands, and any other equipment that was present prior to the installation of the new equipment.
- d) The BHS contractor shall 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 corresponding drawings.
- e) All joints shall be finished smooth and be free of snags and protrusions which could damage baggage, catch bags, or cause the system to jam. All BHS rollers and greaseable bearings shall be easily accessible for removal and/or replacement. Assemble all BHS equipment in such a manner as to facilitate routine maintenance.
- f) Prior to startup of the BHS, polish and buff the bed surfaces smooth and free of sharp edges, dirt, paint, grease, etc.
- g) All BHS stairways, catwalks, cross-overs, handrails, fences, guardrails, impact protection, bollards, working platforms, etc., shall be painted OSHA #1016 or #1026 "Safety Yellow".
- h) The clearance above the baggage conveyor beds shall be thirty-six (36) inch minimum (unless otherwise approved on the drawings). The clearance between the conveyor bed frames and the adjacent walls or obstructions shall be one (1) foot minimum (or as approved on the drawings).
- i) The maximum slope for all incline and decline conveyors shall be twenty-one (21) degrees, (not to exceed existing, unless otherwise approved on the drawings).
- j) Uneven joints in conveyor side guards shall be epoxy filled and ground smooth (to eliminate all snag points), except in areas where stainless shrouding is installed. In these areas, the joints shall be tight without gaps, and smooth without field rework.
- k) 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.

3.3.2 Installation Tolerances

- a) The BHS contractor shall ensure that gaps between end rollers do not exceed 1" (with ½" being the design objective).
- b) Uneven joints to top of sideguard shall be equipped with a 45-degree transition to prevent bag jams from straps, etc.
- c) The BHS contractor shall take special care during the installation to provide smooth, snag-free butt joints without the use of epoxy fillers. Apply epoxy on an exception basis only, when approved by the Owner (or OAR), in the case that a joint cannot be otherwise economically corrected.
- d) The belt tension shall be tight enough to pull the full load capacity (without slipping). Do not "over-tighten" conveyor belts.

3.3.3 Hardware Installation

- a) The BHS contractor shall provide all associated hardware which shall conform to ASTM A325, Type 1, or SAE Grade 5, Class 2A thread fit for bolts and Class 2B thread fit for nuts. All hardware shall be zinc-plated or equivalent (Stainless Steel in public areas).
- b) All hardware shall be locked with locknuts or lock washers, with a minimum of three threads showing after the nut or double nut. All hardware shall be installed in a uniformed manner.
- c) Submit all connection types for fabrication and installation of work wherever connections are required.

3.3.4 Welding

- a) The BHS contractor shall 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.
- b) All welded surfaces shall be ground to create a smooth surface then thoroughly cleaned with a solvent to remove rust, scale, oil, grease, grit, and welding flash. The welded surface shall be primed with rust-preventive primer applied and painted with an alkyd paint to match the shop coat.
- c) Comply with AWS standards for workmanship and for qualifications of welding technicians. "Weld Certifications" are required for all structural welds.

3.3.5 Floor Attachments

- a) Floor attachments shall follow the installation designed as specified by the OEM in the installation drawings.
- b) Floor attachments shall not interfere with egress systems. Floor attachments cannot block access to any equipment, devices, enclosures, etc.

3.3.6 Ceiling Attachments

- a) Ceiling attachments shall be designed to avoid the transmission of excessive conveyor (periodic or transitory) loads into the structure. Provide spring or neoprene isolators for all connections.
- b) 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 shall not exceed three (3) inches in depth.
- c) Attachments to concrete beams shall be with drilled expansion anchors into the sides of beams only and placed a minimum of six (6) inches up from the bottom of the beam. All attachments shall be submitted for approval.
- d) Replace fireproofing materials to an equal depth as the existing fireproofing at attachment locations. Fireproofing shall be of the same type and brand as existing.
- e) All-thread hanger rods shall be continuous with no splices or couplings allowed. Note: An exception is allowed if all-thread length exceeds twelve (12) feet.
- f) All-thread hanger rods shall be installed so as not to block access to the equipment. All-thread hanger rods shall be installed not to create vibration deterioration of the all-thread hanger rod, equipment or installed devices.
- g) Header steel, steel beams and seals shall be installed so as not to block access to the equipment.

3.3.7 Gear Boxes, Reducers, and Drives

- a) The BHS contractor shall install gear boxes and reducers on the conveyor drive shaft so that the compression ring is seated correctly, (to reduce the amount of wobble of the drive system).
- b) Gear boxes and reducers shall be installed with a minimum of a 1/2" of the drive shaft protruding through the gear box or reducer, (to allow for the proper seating of the drive).

3.3.8 Replacement of Fireproofing

The BHS contractor shall repair or replace any fireproofing materials and finishes that were removed or damaged during the demolition, modification, and/or new installation of the BHS equipment or ancillary items.

3.4 BHS ELECTRICAL INSTALLATION

3.4.1 General

- a) All electrical components and materials shall conform to applicable standards of the National Electrical Manufacturers Association (NEMA). All components shall be designed for continuous duty service.

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- b) Applicable requirements of OSHA, ANSI Conveyor Safety Code B20.1, and the National Electrical Code (NFPA 70 - Latest Edition) shall be met, as well as those of any other governmental or local authorities having jurisdiction at the installation site.
 - c) All electrical components mounted to the BHS equipment that are to be removable shall be installed via cannon plugs or equivalent quick-disconnect method.

3.4.2 Power Distribution, Motor Distribution, Control Stations

- a) The BHS contractor shall install electrical devices in accordance with the manufacturer's published instructions. Torque bus bar bolts to manufacturer's recommendations and tighten nuts and bolts on the steel enclosures to provide structural integrity. All terminal blocks and points shall be torqued to the manufacturer's recommended torque value.
- b) Set overload relays at maximum values permitted by NEC 430-32 and 430-34, based on actual installed motor "nameplate full load amperes". Adjust the magnetic settings on motor circuit protectors in accordance with motor inrush currents and NEC requirements.
- c) All open I/O ports shall be covered to prevent debris entering the ports. Enclosures shall be clean of all metal shavings, trash, and debris.
- d) All surfaces to be painted shall be thoroughly cleaned of rust, scale, oil, grease, grit, welding flash, and all other forms of dirt detrimental to good painting practices. All bare metal surfaces shall be primed after cleaning. After installation, all scuffed or otherwise marred surfaces are to be cleaned and a touch-up coating of alkyd paint or rust-preventive primer applied to match the shop coat.

3.4.3 Field Devices

- a) Equipment related materials shall be powder coated or painted with the Owner's (or OAR's) approved color in a uniformed color or to match existing field devices as specified by the Owner (or OAR).
- b) All excess power cable, network cable etc. are to be neatly rolled and placed inside the device J-box when possible. In other cases the excess cord shall be neatly rolled and strapped to the backside of the conveyor leg.
- c) Each device shall be identified by a unique number in a minimum of 1/8" font character using contrasting colors (black letters on white name plates). The name plate shall indicate the device type and the conveyor ID. When multiple devices of similar nature are located on the same equipment a unique identifier shall follow each device.
- d) All field devices shall be mounted for ease of maintenance. Where catwalk is installed, all field devices shall be mounted on the catwalk side of the equipment. All field devices shall be mounted as to prevent damage to the device. All field

devices shall be mounted on the equipment for which the device controls. All field devices shall be installed in a manner not to block access to the equipment.

3.4.4 Pull Boxes, J-boxes, and Raceways

- a) Pull Boxes, J-boxes, Raceways etc. mounted on equipment or equipment- related material in the field shall be permanently labeled or marked with the name of the controlling PDP, MCP and/or PLC enclosure, and shall be securely mounted to "Unistrut" with "zero" horizontal or vertical play.
- b) All boxes shall be installed for ease of maintenance. Where catwalk is installed, all boxes shall be mounted on the catwalk side of the equipment. All boxes and raceways shall be installed as to not block access to the equipment.
- c) Any boxes installed that can be considered a "Head Knocker" shall be padded and clearly identified with (yellow and black) caution tape.

3.4.5 Conduit/Liquid Tight Flexible Conduit

- a) Conduits/liquid tight flexible conduits shall be securely mounted and supported within eighteen (18) inches of a connector or coupling.
- b) All Conduit fittings shall be of the compression type.
- c) Conduits/liquid tight flexible conduits shall follow the National Electrical Code (NFPA 70 Latest Edition) Chapter 9 (Percent of Cross Section of Conduit and Tubing Conductors).
- d) Conduits/liquid tight flexible conduits mounted to equipment shall not block access to the equipment or devices. Conduits/liquid tight flexible conduits shall be installed to prevent rubbing or vibration deterioration against other structures. Conduit drops and raceways shall not interfere with the maintenance access of conveyors.
- e) Conduit drops to ceiling supported equipment shall have a minimum of twenty-four (24) inches of liquid tight flexible conduit installed between the device and box to the conduit to prevent vibration deterioration of conduit. The conduit drops shall not be supported or secured to the ceiling supported equipment.
- f) Liquid tight flexible conduit from MSD shall be no more than 36".

3.5 BHS TESTING AND ACCEPTANCE

3.5.1 General Requirements

- a) Test bags and test personnel shall be used for the BHS contractor's pre-testing, and the acceptance testing performed for the Owner (or OAR).
- b) The BHS contractor shall also provide any necessary test or measuring equipment required to demonstrate the characteristics and performance of the equipment prior to acceptance.

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- c) The test plans and activities shall not relieve the BHS contractor from the obligations of providing work (materials, equipment, fabrication, construction and installation), meeting the requirements of the Contract Documents, and/or promptly correcting deficiencies and maintain quality control measures for all parts of work (whether or not inspected or tested).
 - d) All normal airport operation bag processing shall continue without interruption.

3.5.2 Factory Acceptance Testing

- a) The FAT is a comprehensive system check that will occur at the Controls supplier's facility after the configuration is complete but before the system is shipped to the site. The FAT testing shall show the compliance to the PGDS requirements and BHS specifications for the system to the extent possible. These tests are to be driven by the basis of design input data and report the expected output data.
- b) Provide a dynamic 3-dimensional computer simulation model of the complete BHS Design. The Simulation Model shall accurately model the BHS conveyor system layout, dynamics, controls and flows of individual pieces of baggage. The model shall be a dynamic analysis of the planning flight schedules that incorporates other data and assumptions.
- c) The factory acceptance simulation model shall include interfacing with the actual installed high-level and low-level software. The model shall interface to the actual PLCs and I/O as will be in the installed condition.
- d) The FAT shall test the functionality of both the Lower Level Controls portion of the system as well as portions of the Upper Level Software. The tests will confirm the control system software performs correctly and meets the requirements set out in the PDGS and the Specification. The FAT test shall include network connections, SAC interfaces, SCADA, SAC functionality, and SCADA functionality. The FAT shall verify correct redundancy fail-over functionality for the lower level PLCs and networks and for the upper level servers and networks.
- e) The BHS contractor shall perform internal testing to verify that the system successfully meets the functional and SSTP requirements and provides realistic and accurate results under varying operational input conditions. This is to be done prior to the FAT demonstration.
- f) Witnessed Factory Acceptance Testing shall be performed at approved time and place submitted in the FAT agenda. Model testing and experimentation shall take place according to the approved factory acceptance test plan to prove that the model accurately represents the BHS functions and performance. Items identified during the Witnessed Factory Acceptance Test, as being deficient, shall be rectified prior to installation on-site.

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- g) Provide appropriately qualified personnel on a dedicated basis during this period to perform the simulation runs and, where necessary, make design changes to the Simulation Model.

3.5.3 Site Testing Support

3.5.3.1 General

- a) The BHS contractor shall provide all labor and trades required to inspect both the mechanical and electrical systems of the baggage handling system with the Owner (or OAR), and Code Compliance inspector.
- b) Additionally, the BHS contractor shall provide all required test equipment and technical support personnel to support the baggage handling system inspections.
- c) At a minimum, the required test equipment shall include:
 - 1. Laptop computers with applicable software & peripherals
 - 2. Volt-Ohm Meter (VOM)
 - 3. Clamp on type ammeter
 - 4. Direct F.P.M. digital readout tachometer
 - 5. Tape Measure
 - 6. Stopwatch
 - 7. Two-way radios and/or cell phones
 - 8. Digital camera and/or video recording device
- d) The BHS contractor shall also have appropriate service personnel on-site during the acceptance inspection, and testing periods to service or adjust, (as required), the baggage handling systems equipment.
- e) The service personnel shall also open control boxes, control station covers, drive assembly chain/v-belt guards, covers, etc. for the Owner (or OAR) inspection of the baggage handling systems.
- f) All material to be used for the load and rate tests, plus personnel to handle it, shall be provided by the BHS contractor.
- g) The BHS contractor shall have a representative on site during all periods of the systems conditional acceptance, (as well as), final acceptance inspection and testing sessions.

3.5.3.2 Test Bags

- a) The Contractor shall provide all test bags and testing material in bags.
- b) The test bag set shall be mixed bags including but not limited to; totes, carry-on sized bags, soft sided bags, hard sided bags, garment bags, duffel

bags, military-style duffel bags, and items that may be conveyed, such as gun cases, coolers, etc. Overheight shall be included with the test bags.

- c) Low profile tubs shall also be used during testing as appropriate for bags that would be placed in tubs as outlined in the tubing policy.
- d) All test bags shall be clearly marked as test luggage. Alarm bags must be clearly identifiable as such on the outside of the bag.
- e) The BHS contractor shall coordinate the use of airport test tubs if explicitly permitted to do so, otherwise, the contractor shall provide tubs as required for testing. The contract shall not negatively impact operations when using airport tubs and replace any damaged airport tubs at no cost to the owner.

3.5.4 BHS Inspection and Testing

3.5.4.1 General

- a) The BHS contractor shall provide a test plan for each system, which shall (at a minimum), incorporate the requirements listed above in the Post-installation Testing section, and requirements per the Contract Documents.
- b) The test plan shall include the static and dynamic test procedures, as specified. The BHS contractor shall also include in the test plan for each test performed:
 - 1. All required personnel
 - 2. Test luggage, counts and types
 - 3. Induction points
 - 4. Induction rates
 - 5. Additional materials or tools
 - 6. Reports used for documentation of the tests
 - 7. Pass/Fail criteria of tests
- c) After the completion of the baggage handling systems installation and debugging, the BHS contractor shall demonstrate to the Owner (or OAR) that the baggage handling systems meet all aspects of the Project specifications.
- d) All BHS testing and "debugging" shall be complete prior to the demonstration of the systems during commissioning.
- e) The BHS contractor shall perform a complete inspection of all the mechanical aspects of the systems and/or sub-systems.
- f) The BHS contractor shall test the operation and functionality of the MDS. The operation and functionality of the PLC programming shall be tested

using simulations for the baggage system operation prior to final installation and connection to the baggage system.

- g) Perform a thorough inspection of the systems and make any adjustments to belts and/or controls (as required).
- h) Check-out the system's operational controls and safety devices (using bags, totes, or boxes).
- i) Test the ability of the BHS to transport the required sizes and weights of baggage (through the conveyor systems), without jamming or toppling the baggage.
- j) Test the capability to handle the required maximum baggage handling rates of the systems. The operating speed of each component of the systems shall be measured (using a standard device) and shall be recorded on the Equipment Description list.
- k) Any component not operating within two percent (2%) of the design speed shall be replaced or reworked to bring it up to the design speed.
- l) The BHS contractor shall provide at least 40 hours of continuous operation under no-load conditions followed by a complete system inspection for necessary corrections, and/or belt adjustments.
- m) BHS inspections and tests listed below are required for the Owner (or OAR) approval.
 - 1. Static Inspection:
 - i. Mechanical
 - ii. Electrical
 - iii. Motor Control Panel
 - 2. Dynamic Inspections:
 - i. Mechanical
 - ii. Electrical
 - 3. Functional Inspections:
 - i. Start
 - ii. Manual Stop
 - iii. Autostop
 - iv. Cascade Stop
 - v. E-Stops
 - vi. Bag Jams
 - vii. Oversize

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- viii. Overload Trip
 - ix. Motor Safety Disconnect
 - x. Door Functions
 - xi. Other Basic Functions

3.5.4.2 Post-Installation Inspection

- a) After the completion of the baggage handling systems installation, the BHS contractors shall provide (in writing) documentation of all performed and corrected static inspections. The BHS contractor shall use the provided static inspections form for each conveyor (or an equivalent approved form).
- b) The corrected form shall demonstrate to the Owner (or OAR) that the delivered baggage handling systems meets all aspects of the Project specifications.
- c) Prior to both the electrical and mechanical static inspections, the BHS contractor shall demonstrate that the BHS is safe and ready for inspection. This shall include all "Lock-out/Tag-out" procedures, and all E-Stop zones are operational and acceptable.
- d) All discrepancies discovered during static inspections by the Owner (or OAR), or the Airport's Safety Inspector shall be documented on the BHS Issues log.
- e) The BHS contractor shall provide all labor and trades required to inspect both the mechanical and electrical systems of the baggage handling system with the Owner (or OAR).
- f) Additionally, the BHS contractor shall provide all required test equipment, test bags and technical personnel to support the baggage handling system inspections.
- g) The BHS contractor shall also have appropriate service personnel on-site during the acceptance inspection and testing period to service or adjust, (as required), the baggage handling system equipment.
- h) The service personnel shall also open control boxes, control station covers, drive assembly chain/v-belt guards, covers, etc. for Owner (or OAR) inspection of the baggage handling system equipment.
- i) The BHS contractor shall submit a test program for each system of each Project for compliance with above demonstration requirements.
- j) The test program shall (at a minimum) incorporate the information contained in the conditional acceptance test and inspection documentation, presented in this section of the specification supplement, for the specified Project.

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- k) The BHS contractor shall be required to develop a test program for each system that shall identify and demonstrate all system control functions. The test program shall list each control station, control device, etc., and its related control function that shall be demonstrated and/or tested.
 - l) All tests witnessed by the Owner (or OAR) (both pass and fail) shall be assembled for submission (electronically and hard copy) to the Owner (or OAR) for review and approval.

3.5.4.3 Empirical Readings

- a) The recorded information shall be considered as the system empirical readings. The empirical readings shall also be included, by the BHS contractor, in each of the O&M manuals for reference information.
- b) The test program and system empirical readings information sheets presented within this section of the specification have been specifically developed for outbound baggage handling systems as an example of required information.
- c) The test program shall include the recording of the following information per system, (during the inspection and testing of the systems). All actual speeds and motor currents shall be measured with the systems in a "no-load" condition.
 - 1. Main Feeds:
 - i. Fuse size per phase
 - ii. Actual amperage per phase
 - 2. Transformers:
 - i. Fuse size per phase
 - ii. Actual amperage per phase
 - 3. Conveyor/Device Speed:
 - i. Actual center line speed of conveyor/device
 - 4. Motor Name Plate Data:
 - i. Manufacturer
 - ii. Horsepower
 - iii. Nameplate Motor Current
 - iv. Voltage
 - v. Phase
 - vi. Hertz
 - vii. Frame Size

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- viii. Type
 - ix. RPM
 - x. NEMA Design
 - xi. Service Factor
 - xii. Insulation Class
 - xiii. Insulation Type

- 5. Fuse or Circuit Breaker size per phase
- 6. Actual amperage per phase
- 7. Overload size or designation
- 8. Noise Level Test Results

3.5.4.4 No-Load Test 40 hour Run-in

- a) The BHS contractor shall run all of the baggage handling systems' conveyors without a load for five (5) days, eight (8) continuous hours.
- b) The speed of each conveyor shall be measured at twenty (20) minute intervals during the first and last hours.
- c) If the actual speed does not meet the specified speed (+/-2%), the BHS contractor shall modify and/or adjust the drive unit, as required, to comply and repeat the test.
- d) During this time, all the conveyors shall be inspected for abnormal noises, fluid leaks or any signs of poor operation.
- e) After at least 40 hours of operation, the BHS shall be inspected for necessary corrections and/or adjustments by the contractor.
- f) All associated conveyors shall be checked for proper belt tracking.
- g) Adjustments shall be made for accurate tracking (as required).

3.5.4.5 Load Test

- a) Prior to performing the load test, the contractor shall insure that all no-load tests have been performed and documented.
- b) The contractor shall perform load tests for the BHS conveyors and document the results. The contractor shall be responsible to provide the load test ballast items in sufficient quantity to conduct all tests. Load test ballast handling and clean-up shall be the responsibility of the contractor.
- c) For slope plate and makeup devices having multiple drives, the device shall be tested by starting the device from a stopped condition with both drives operating as well as operating on a single drive (for each drive).

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- d) Slope plate and makeup devices shall be run with the full load test weight for 1 hr while sampling and recording the amp readings on all phases every 15 minutes. The unit will operate with the number of drives expected to be in use under normal conditions for this test.
 - e) Ballast (weights) amount shall correspond to the design loads for the given equipment as define in this specification. Ballast shall be distributed along the conveyor evenly and not bind or catch anywhere on the equipment being tested. Ballast material utilized for load tests shall not damage, leak, spill, or create hazards to the equipment and local environment. Perishables shall not be used.
 - f) The load test tests shall verify that the amperage for each drive motor does not exceed the rated full load amperage (FLA). The measurement will be compared to the full load amperage indicated on the drive motor. All three phases (480v 3ph) shall be measured simultaneously and shall be consistent when tested.
 - g) The BHS contractor shall perform a load test for each system complying with the load requirements (identified herein).
 1. The BHS load tests shall be performed on the final complete systems. The BHS contractor shall provide the load test demonstration immediately following the 40 hour no-load test.
 2. All amp readings shall be recorded from the load side of the starter on non-VFDs. On VFDs, the amp reading shall be taken from the load side of the VFD.
 3. Prior to load testing, BHS contractor shall be required to provide Owner (or OAR) with a complete motor manifest showing no-load amps along with their respective belt speeds.
 4. All load tests shall be performed prior to operational use of conveyors. All amp readings shall be conducted and recorded with weight using load specified.
 - h) The BHS contractor shall submit in writing to the Owner (or OAR) all No-Load Amp readings after the 40-hour no-load test has been completed and a minimum of two (2) business days prior to conducting the BHS system load test.

3.5.4.6 Mechanical Static Inspections

- a) Provide a comprehensive, easy to read mechanical equipment inspection plan for every piece of mechanical equipment installed as part of the BHS
- b) The following is intended to be a guideline and is not to be construed as all-inclusive. This inspection plan shall verify adherence to the Specification for the following items:

Belt Conveyors (Mechanical):

1. Gaps between adjacent head and tail pulleys
2. Vertical clearance
3. Angle of incline/decline
4. 4" Conveyor I.D.
5. Gaps between adjacent bed sections
6. Gaps between adjacent side guard sections
7. Baggage snag points
8. Sharp edges or shear burrs
9. Condition of painted surfaces
10. Tightness of all hardware
11. Alignment of stainless steel trim and bed section filler plate
12. Spacing of vertical braces for side guards and back guards
13. Spacing of conveyor supports
14. Sway bracing
15. Trim securement
16. Screw type and countersinking
17. Safety guarding
18. Belly pans
19. Anchoring and mounting of access ladders
20. Installation of right angle transfer transition plate
21. Belting material and splicing
22. Belt lacing size and cable
23. 1" V-notch in belting splice
24. Belt path routing
25. Belt wrap
26. Belt tension
27. Pulley diameter
28. Pulley shaft diameter
29. Vertical alignment of head and tail pulleys
30. Lateral position of pulleys

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31. Return roller diameter
 32. Return roller spacing
 33. Bearing mounting lock washers
 34. Bearing jacking bolts
 35. Bearing grease zerk removal
 36. Bearing caps
 37. Motor and speed reducer mounting lock washers
 38. Speed reducer drip pan
 39. Motor/speed reducer related sprocket/sheave and shaft alignment
 40. Motor/speed reducer related sprocket or sheave key tightness
 41. Motor/speed reducer related chain/V-belt tension
 42. Chain/V-belt safety guard
 43. Speed reducer leakage
 44. Speed reducer lubrication level
 45. Mounting of speed reducer torque arm
 46. Safety finger guards on end pulleys at staffed conveyors
 47. 25% take-up pulley position
 48. Installation of strip door type draft curtain
 49. Installation of fire/security doors
 50. Removal of construction related debris
 51. Maintenance access
 52. Protective guard railing installation
 53. Vertical clearance for traffic aisles.

Incline Plate/Slope Pallet Devices:

1. Vertical clearance above plates/pallets
2. Gaps between adjacent back guard sections
3. Gap between perimeter finger guard and top of pallet not in excess of 1/8"
4. Skirting above and below device conveying surface
5. Sharp edges or shear burrs
6. Condition of painted surfaces

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7. Tightness of all hardware
 8. Trim securement screw type and countersinking
 9. Baggage snag points
 10. Drive assembly safety guarding
 11. Speed reducer drip pan
 12. Motor/speed reducer type and alignment
 13. Motor-driven sprockets/sheaves alignment
 14. Motor-driven chain/V-belt tension
 15. Speed reducer oil leakage
 16. Removal of construction debris
 17. Maintenance access
 18. Protective guard railing
 19. Pallet-driving sprocket alignment
 20. Pallet-driving chain tightness.

3.5.4.7 Electrical Static Inspection

- a) Provide a comprehensive, easy to read electrical equipment inspection plan. For the determination of terminal tightness, all terminals in motor control panels or field mounted devices shall be tightened to the manufacturer's recommended torque specifications utilizing a certified calibrated torque wrench or approved equal tool.
- b) The BHS contractor shall be required to demonstrate to the Owner (or OAR) that the screws are set at the proper torque value and the BHS contractor shall include this information in the below referenced electrical static inspection reports.
- c) This inspection plan shall verify adherence to the Specification for the following items:

Motor Control Panels:

1. I.D. information for MCP and all devices contained within
2. Control station I.D./function tags
3. Illuminated push button switch protective guard ring
4. Location of control devices
5. Tightness of all hardware
6. Control circuit wiring size, type, color, and number tag

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7. Power circuit wiring size, type, color, and number tag
 8. Wire "whiskers" at terminal points
 9. Wiring terminal point screw tightness
 10. Panduit wire raceway
 11. Splices in Panduit wire raceway
 12. Panduit wire raceway covers installed
 13. Conduit routing and mounting
 14. Tightness of conduit fittings
 15. Conduit bushings and chase nipples
 16. "Air-space" around programmable logic controllers
 17. MCP doors mechanical safety interlock
 18. Safety shield over line and load terminals of MCP main breaker/fuses
 19. Actual BHS orientation on status panel
 20. Restraint clips for plug-in type power supply
 21. Installation of hour meter and I.D. tag.

Belt Conveyors:

1. Control station I.D./function tags
2. Control station accessibility/location
3. Disconnect switch accessibility/location
4. Illuminated push button switch protective guard ring
5. Tightness of all hardware
6. Photo-eye and/or limit switch mounting
7. Encoder mounting and coupling
8. Control circuit wiring size, type, color, and number tag
9. Power circuit wiring size, type, color, and number tag
10. Wire "whiskers" at terminal points
11. Wiring terminal point screw tightness
12. No splice point wire nuts within junction boxes
13. Conduit routing and mounting
14. Tightness of conduit and sealtite fittings
15. Junction box covers installed

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16. Unused openings in junction boxes or control device boxes
 17. Motor Safety Disconnect switch lockout capability
 18. Lanyard cable supports and cord switch mounting
 19. Maintenance access
 20. Record motor name plate data
 21. Record size of motor overload heaters
 22. Record size of all fuses

Flat Plate / Slope Pallet Devices:

1. Control station and disconnect switch accessibility/location
2. control station ID/function tags
3. Illuminated pushbutton switch protective guard ring
4. Tightness of all hardware
5. Photocell mounting
6. Control circuit wiring size, type, color, and number tag
7. Power circuit wiring size, type, color, and number tag
8. Wire "whiskers" at terminal points
9. Wiring terminal point screw tightness
10. Splice point wire nuts within junction boxes
11. Conduit routing and mounting
12. Tightness of conduit/sealtite fittings
13. Junction box covers
14. Unused openings in junction boxes or control device boxes
15. Safety disconnect switch lockout capability
16. Maintenance access
17. Record motor name plate data, size of motor overload heaters, and size of all fuses.

3.5.4.8 Mechanical Dynamic Inspections

- a) Provide a comprehensive, easy to read mechanical test plan. This test plan, at a minimum, shall verify the specified functionality of the following:
- b) Belt Conveyors:
 1. Conveyor speed
 2. Excessive vibration

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3. Operation of clutch/brake units
 4. Lateral movement of speed reducer on shaft during start/stops
 5. Abnormal noises
 6. Torsion flexing of drive assembly during start/stop operation
 7. Operation of controls

3.5.4.9 Functional Testing

- a) The BHS contractor is required to develop and execute an approved test plan for each system to identify and demonstrate all the System Control Functions.
- b) The test plan shall list each Control Station, Control Devices, etc., and its related control function that shall be demonstrated and/or tested (in a checklist format) with "Pass" and "Fail" check boxes, the date, and the recorder's initials (for each item).
- c) Any item that fails during a test shall be re-tested (after corrections are made) and another checklist shall be used in the test recording of the previously failed items.
- d) The BHS contractor shall provide the Owner (or OAR) with all checklists produced during testing. The functional test plan shall be provided in both hard copy for field use during the testing process and a completed copy in (based upon acceptance testing) electronic ".pdf" format.
- e) The BHS contractor shall provide a comprehensive, easy to read functional test plan that clearly identifies the following at a minimum:
 1. All installed control devices
 2. The control device locations in the BHS
 3. The function of the control devices
 4. All conveyors affected by the control devices
 5. Security/Fire Door functions
 6. The expected field result with applicable system monitor message and/or display.
 7. Photo-eyes and/or limit switches
 8. Status lights
 9. Start-up alarms
 10. Fault warning alarms
 11. Fault warning alarms with multiple faults
 12. Fault warning alarm silence button

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13. Motor overloads
 14. Motor disconnects
 15. Auto start
 16. Auto shut-down
 17. Manual stop
 18. E-Stop function
 19. Cascade operation
 20. Overheight/Overlength function (if applicable)
 21. Jam function

3.5.5 Test Documentation

- a) The test program shall be organized by test in a three (3) ring binder, and also provided in ".pdf" format, and submitted by the BHS contractor for Owner (or OAR) review and approval at least 21 days prior to owner testing.
- b) All executed (passed or failed) tests shall be documented in the test plan forms. All test documentation shall be submitted to the Owner (or OAR) for their review seven (7) days after test completion. This information shall be organized in a three (3) ring binder by test, date, results, associated reports, etc. Electronic media (".pdf" format) may be accepted if approved by Owner (or OAR) and presented in a similar manner as organized above.
- c) The BHS contractor shall record the test data on the "Test Record Forms" and furnish two (2) copies to the Owner (or OAR) prior to final acceptance.
- d) The final BHS dynamic and static test results shall be included in the final O & M manuals for reference information.

3.5.6 Conditional Acceptance

3.5.6.1 Conditional Acceptance Requirements

- a) Conditional acceptance for each baggage handling system or phase shall only be considered after the following are successfully completed:
 1. All Operations and Maintenance training specified for Airport personnel has been completed.
 2. The final Operation and Maintenance (O&M) manuals have been delivered to the Owner (or OAR).
 3. All spare parts (that were purchased by the Owner) for the subsystem or phase, have been delivered.
 4. All equipment or special tools required for maintenance (that were purchased by the Owner) have been delivered.

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- b) Provide the names, addresses and 24-hour phone numbers of representatives who have the authority and experience to make immediate replacements and repairs for the full life of all BHS warranties.
 - c) The BHS (including all upper and lower level controls) shall demonstrate compliance with the approved Test Plan. Any system deficiencies (punch list items) shall be corrected before performing the subsequent inspections or tests.
 - d) When the specified inspections and testing are successfully completed, the Owner (or OAR) shall issue a written "Notice of Conditional Acceptance".
 - 1. The associated "Conditional Acceptance" status shall indicate that the Owner (or OAR) has approved the equipment (as worthy for operational use).
 - 2. The "Conditional Acceptance" shall not relieve the responsibility for maintenance, insurance and/or security on the associated baggage system.
 - 3. The "Conditional Acceptance" shall in no way relieve the responsibility for performing all the work set forth in the Contract Documents.
 - 4. At the time of "Conditional Acceptance", the amount of retention held until issuance of a "Certificate of Final Acceptance" shall be a summation of a predetermined percentage of the total value of the Project, and the assessed value of any open punch list items (to be determined by the Owner).
 - e) "Conditional Acceptance" is applicable to each baggage handling system, or construction phase, and shall be issued in writing by the Owner (or OAR), prior to commencement of subsequent construction phases. "Final Acceptance" of individual construction phases or subsystems shall not apply.

3.5.6.2 Conditional Acceptance Operational Period

- a) Upon the issuance of a "Certificate of Conditional Acceptance", a 30 day "Operational Period" shall commence. The Owner shall put all the associated systems into on-line operations, processing the daily flow of baggage.
- b) During this 30 day "Operational Period", the BHS contractor shall provide full-time technical site representation during the actual hours of operation, with a minimum of 16 hours per day, seven (7) days per week for the first 14 days. The BHS contractor shall be responsible to provide reports required per PGDS to the TSA during this timeframe, either on site or remotely connected.

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- c) The BHS contractor shall ensure that the representatives shall be capable, and duly qualified, to provide service for any problems that may be encountered, which occur during this period.
 - 1. The BHS contractor shall have one (1) qualified person per shift (at a minimum) to troubleshoot and immediately resolve any problems which may arise.
 - 2. The BHS contractor's on-site personnel shall be capable of troubleshooting and resolving all mechanical, electrical and controls related issues.
 - d) During the 30 day "Operational Period", the BHS contractor shall be responsible for all maintenance and operational issues, required on the BHS. During this time period, the BHS contractor shall be responsible for ensuring that the BHS is fully functional during all Airport operational hours.
 - e) If any downtime occurs (during these hours) due to major faults in the BHS (i.e. PLC fault, motor overloads, etc.) the BHS contractor shall be responsible for immediate rectification and assisting the Owner, so that operations is not impacted in any way.
 - f) During the 30 day "Operational Period", it shall also be the responsibility of the BHS contractor to keep a detailed computer log, (as detailed in the Submittal Requirements of this specification).
 - g) If a problem occurs (within the BHS), after the Owner has elected to not require full-time technical site representation after the 30 day "Operational Period", the BHS contractor shall supply the names, addresses and 24-hour phone numbers of technical representatives that can be contacted (who have the authority and experience) to make immediate rectifications or recommendations, and assist the Owner or the Owner's maintenance contractor to return the system to a fully functional on-line state (in the shortest possible time frame).
 - h) If site representation is deemed unnecessary, (at the Owners discretion) it shall be discontinued, and the Owner shall receive a pro-rated credit.

3.5.7 Final Acceptance

- a) "Final Acceptance" of the BHSs shall only be considered after all the systems have conformed to the "Conditional Acceptance" terms, and all phases have successfully completed the 30 day "Operational Period", and the following criteria is met:
- b) The BHS has not experienced any repeated repairs and adjustments, and is achieving the specified rate, accuracy and availability standards (as required by this specification).

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- c) The BHS has successfully completed the specified Inspections and testing, with no outstanding punch list items.
 - d) The BHS is in full compliance with the Contract Documents.
 - e) The Owner and all other governing agencies have made their inspections and given their approvals.
 - f) "Certificates of Installation Compliance" have been issued to the Owner (or OAR).
 - g) Warranties for all associated materials and equipment received from Subcontractors and Suppliers have been provided to the Owner.
 - h) The Owner's purchased spare parts and tools audit has been conducted.
 - i) All purchased tools have been turned over to the Owner (or OAR).
 - j) All spare parts purchased by the Owner (or OAR) have been delivered.
 - k) The PLC and source codes for all programs in the BHS computer system have been provided to the Owner (or OAR).
 - l) Accurate "As-built" drawings and manuals (as specified herein) have been delivered to the Owner (or OAR).
 - m) All BHS Operation and Maintenance training has been completed and approved by the Owner (or OAR).

3.6 OPERATIONS AND MAINTENANCE TRAINING

3.6.1 Scheduled BHS Training

- a) Prior to the "Conditional Acceptance" of the baggage handling system, BHS contractor shall provide the following training to Owner (or OAR), and appropriate Airline Personnel.
 - 1. "Operations Training" shall consist of 20 hours of training for the Airline carriers, and Owner staff to cover the operational functions of all systems and all pertinent sections of the Operations and Maintenance manual.
 - I. Training sessions shall be conducted in two (2) sessions, (AM and PM) to allow maximum participation for shift personnel.
 - II. All training sessions shall be professionally recorded on video tape (or digital recorder), with voice over narration by the BHS contractor. The Owner shall receive two (2) DVD's of the "Operations Training" sessions.
 - III. The training sessions shall be organized, using presentation materials, handouts, power point presentations and other training tools to thoroughly demonstrate and explain the operational, controls and reporting characteristics of the system.

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2. "Maintenance Training" shall consist of 20 hours of training, including "classroom" and "hands-on" type programs. "Hands-on" training includes actual troubleshooting, adjustment of equipment, and component removal and/or replacement.
 - I. Training sessions shall be conducted in two (2) sessions, (AM and PM) to allow maximum participation for shift personnel.
 - II. All training sessions, classroom and hands-on, shall be professionally recorded on video tape (or digital recorder) with voice over narration by the BHS contractor. The Owner (or OAR) shall receive two (2) DVD's of the "Maintenance Training" sessions.
 - III. The training sessions shall be organized, using presentation materials, handouts, power point presentations and other training tools to thoroughly demonstrate and explain the routine and periodic maintenance required, including component removal and/or replacement on the system.

3.6.2 Supplemental Training

- a) Should the Owner (or OAR) require supplemental training beyond that specified above, it shall be provided by BHS contractor at a time and at rates as mutually agreed upon between Owner (or OAR) and the BHS contractor.

END OF SECTION 34 7739